NFSU

National Forensic Sciences University

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An Institution of National Importance
(Ministry of Home Affairs, Government of India)

LAB MANUAL
OF
"INCIDENT RESPONSE AND DIFITAL FORENSICS"

Submitted To

National Forensic Sciences University

MASTER OF SCIENCE

In

CYBER SECURITY

Submitted By

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Experiment: 1

Title: Analysis and monitor system log using event viewer

Requirement: Event Viewer

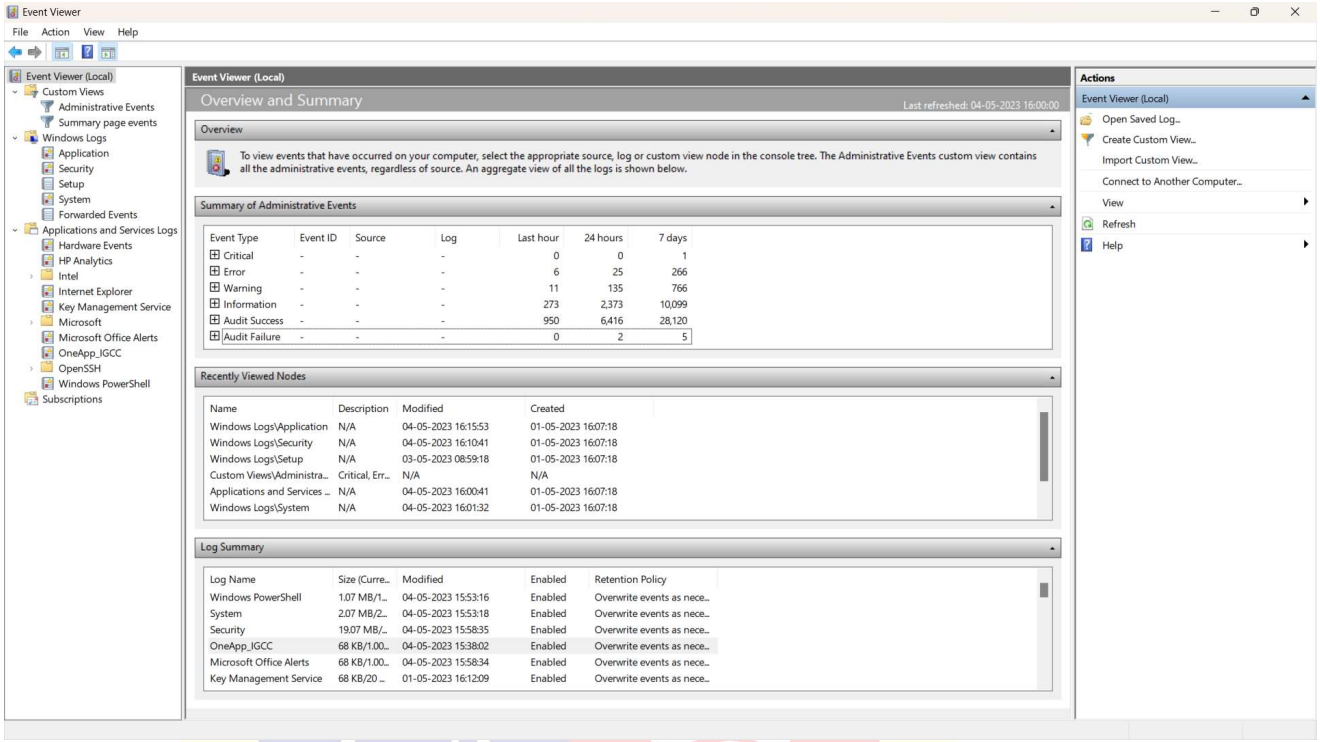
Procedure/experiment steps:

- Open Event Viewer : Start > event viewer
- In general we can see information in a middle Pannal as
    - Summary of administrative event
        - Event type
            - Critical
            - Error
            - Warning
            - Information
            - Audit Success
            - Audit Failure
        - Event id
        - Source
        - Log
        - Last hour
        - 24 hour
        - 7days
    - Recently View Nods
    - Log summary
        - Log name
        - Size
        - Modified
        - Enable
        - Retention policy
- There is different log type in the left Pannal
    - Custom
    - Windows Log
    - Application and Service logs
    - Subscription

- Select and view different logs

- Select any section and sub section and see the different logs and what this log contains

Result:


Event Viewer
File Action View Help
Event Viewer (Local)
Custom Views
Administrative Events
Summary page events
Windows Logs
Application
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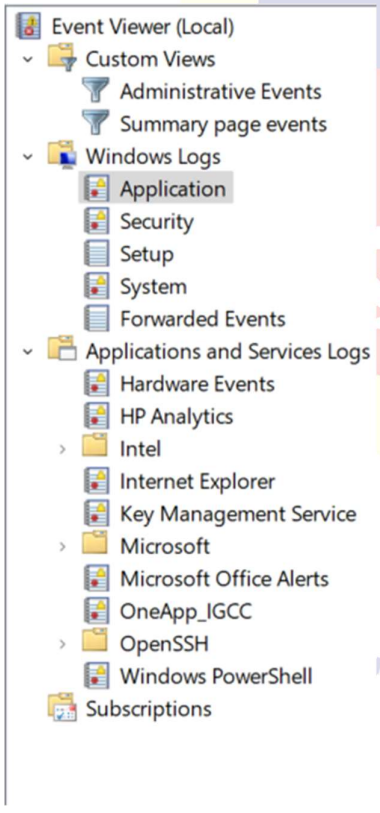
Setup
System
Forwarded Events
Applications and Services Logs
Hardware Events
HP Analytics
Intel
Internet Explorer
Key Management Service
Microsoft
Microsoft Office Alerts
OneApp_IGCC
OpenSSH
Windows PowerShell
Subscriptions
Event Viewer (Local)
Overview and Summary
Last refreshed: 04-05-2023 16:00:00
Overview
To view events that have occurred on your computer, select the appropriate source, log or custom view node in the console tree. The Administrative Events custom view contains all the administrative events, regardless of source. An aggregate view of all the logs is shown below.
Summary of Administrative Events
Event Type Event ID Source Log Last hour 24 hours 7 days
Critical - - - 0 0 1
Error - - - 6 25 266
Warning - - - 11 135 766
Information - - - 273 2,373 10,099
Audit Success - - - 950 6,416 28,120
Audit Failure - - - 0 2 5
Recently Viewed Nodes
Name Description Modified Created
Windows Logs\Application N/A 04-05-2023 16:15:53 01-05-2023 16:07:18
Windows Logs\Security N/A 04-05-2023 16:10:41 01-05-2023 16:07:18
Windows Logs\Setup N/A 03-05-2023 08:59:18 01-05-2023 16:07:18
Custom Views\Administra... Critical, Err... N/A N/A
Applications and Services ... N/A 04-05-2023 16:00:41 01-05-2023 16:07:18
Windows Logs\System N/A 04-05-2023 16:01:32 01-05-2023 16:07:18
Log Summary
Log Name Size (Curre... Modified Enabled Retention Policy
Windows PowerShell 1.07 MB/1... 04-05-2023 15:53:16 Enabled Overwrite events as nece...
System 2.07 MB/2... 04-05-2023 15:53:18 Enabled Overwrite events as nece...
Security 19.07 MB/... 04-05-2023 15:58:35 Enabled Overwrite events as nece...
OneApp_IGCC 68 KB/1.00... 04-05-2023 15:38:02 Enabled Overwrite events as nece...
Microsoft Office Alerts 68 KB/1.00... 04-05-2023 15:58:34 Enabled Overwrite events as nece...
Key Management Service 68 KB/20 ... 01-05-2023 16:12:09 Enabled Overwrite events as nece...
Actions
Event Viewer (Local)
Open Saved Log...
Create Custom View...
Import Custom View...
Connect to Another Computer...
View
Refresh
Help


Event Viewer (Local)
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Summary page events
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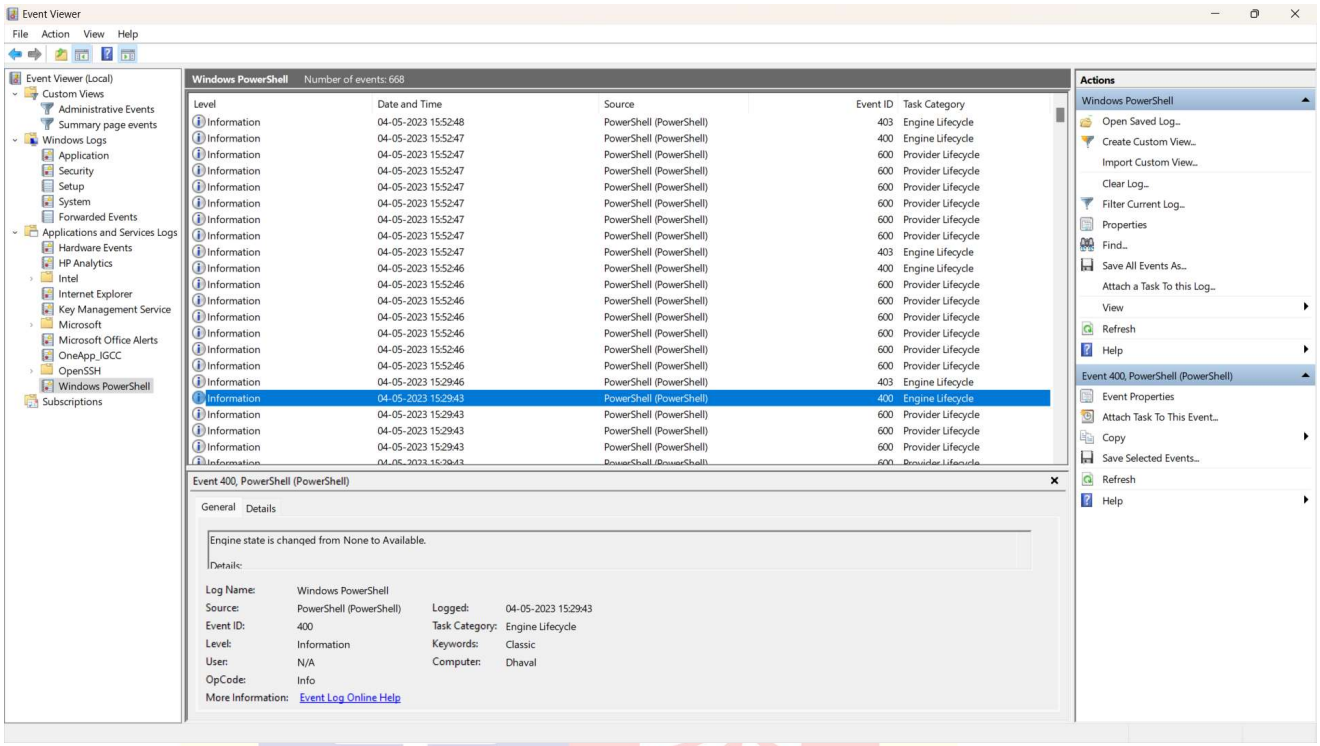
Hardware Events
HP Analytics
Intel
Internet Explorer
Key Management Service
Microsoft
Microsoft Office Alerts
OneApp_IGCC
OpenSSH
Windows PowerShell
Subscriptions


Event Viewer
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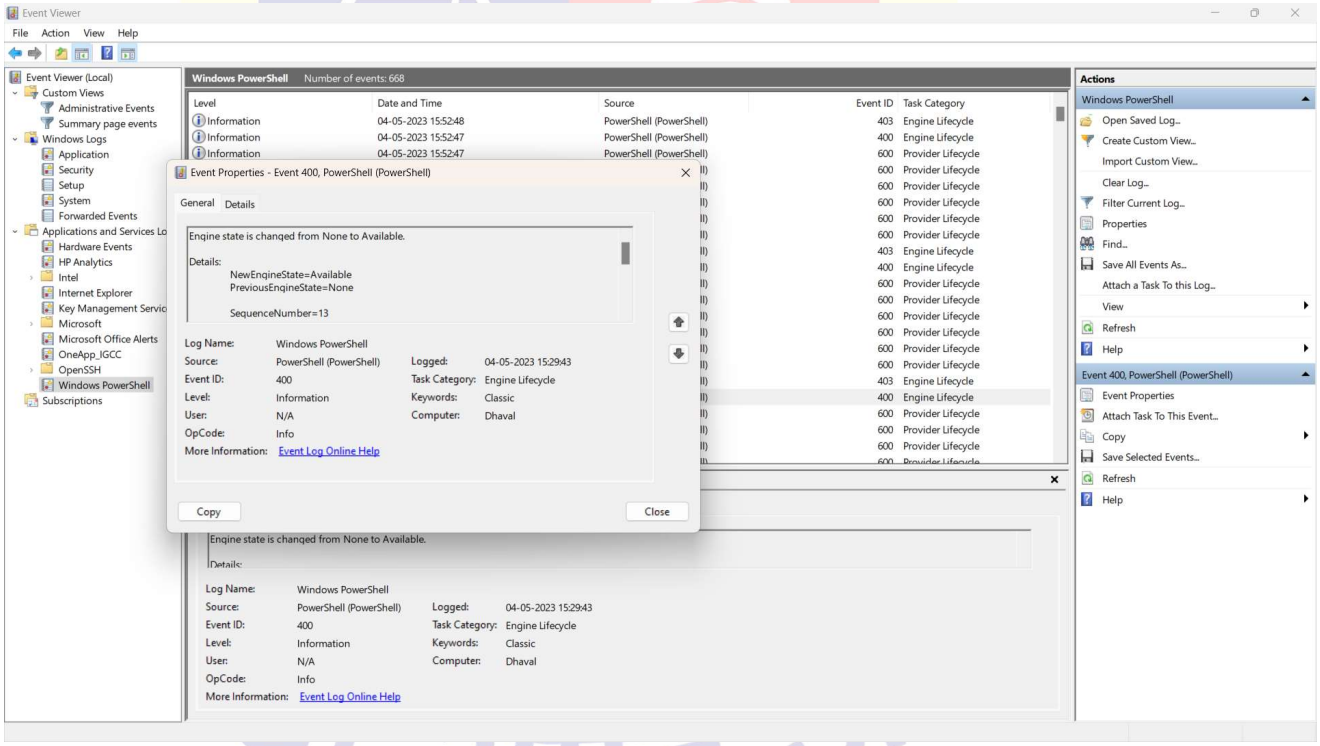
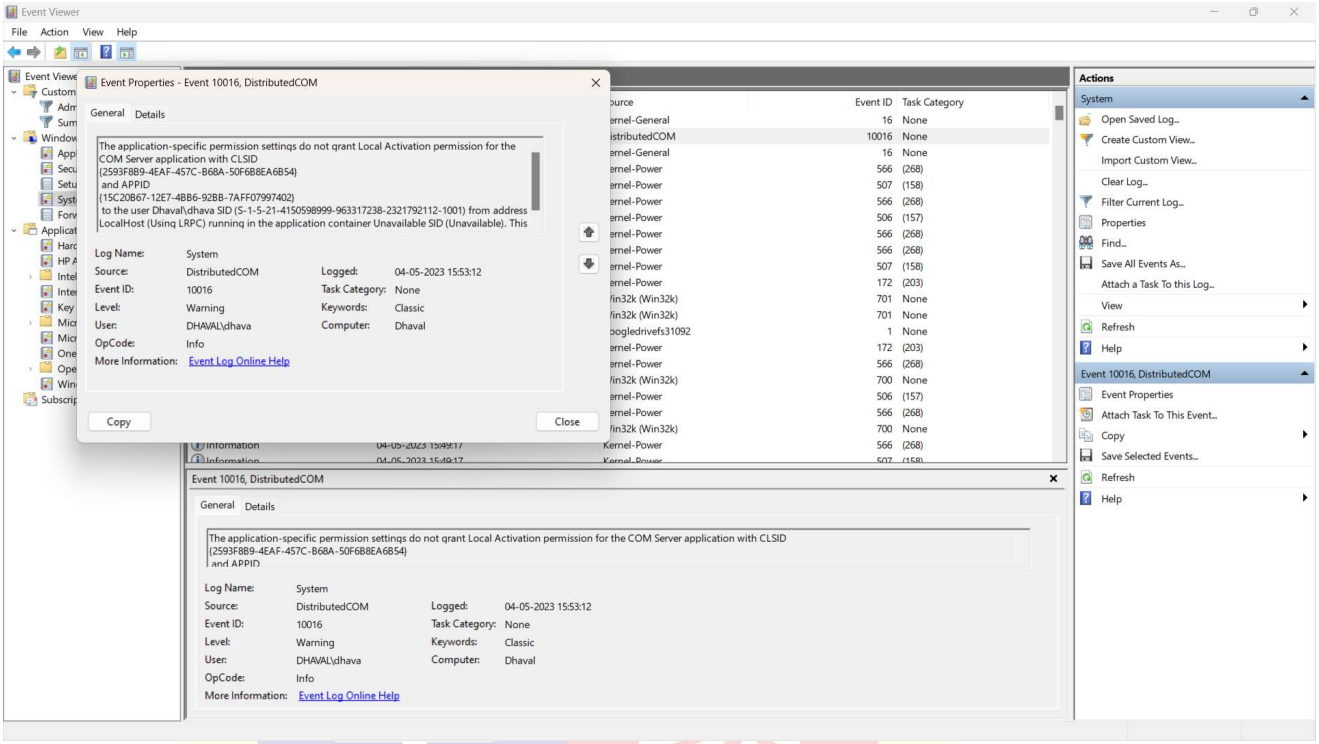
Hardware Events
HP Analytics
Intel
Internet Explorer
Key Management Service
Microsoft
Microsoft Office Alerts
OneApp_IGCC
OpenSSH
Windows PowerShell
Subscriptions
Windows PowerShell Number of events: 668
Level Date and Time Source Event ID Task Category
Information 04-05-2023 15:52:48 PowerShell (PowerShell) 403 Engine Lifecycle
Information 04-05-2023 15:52:47 PowerShell (PowerShell) 400 Engine Lifecycle
Information 04-05-2023 15:52:47 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:47 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:47 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:47 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:47 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:47 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:47 PowerShell (PowerShell) 403 Engine Lifecycle
Information 04-05-2023 15:52:46 PowerShell (PowerShell) 400 Engine Lifecycle
Information 04-05-2023 15:52:46 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:46 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:46 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:46 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:46 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:52:46 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:29:46 PowerShell (PowerShell) 403 Engine Lifecycle
Information 04-05-2023 15:29:43 PowerShell (PowerShell) 400 Engine Lifecycle
Information 04-05-2023 15:29:43 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:29:43 PowerShell (PowerShell) 600 Provider Lifecycle
Information 04-05-2023 15:29:43 PowerShell (PowerShell) 600 Provider Lifecycle
Event 400, PowerShell (PowerShell)
General Details
Engine state is changed from None to Available.
Details:
Log Name: Windows PowerShell
Source: PowerShell (PowerShell) Logged: 04-05-2023 15:29:43
Event ID: 400 Task Category: Engine Lifecycle
Level: Information Keywords: Classic
User: N/A Computer: Dhaval
OpCode: Info
More Information: Event Log Online Help
Actions
Windows PowerShell
Open Saved Log...
Create Custom View...
Import Custom View...
Clear Log...
Filter Current Log...
Properties
Find...
Save All Events As...
Attach a Task To this Log...
View
Refresh
Help
Event 400, PowerShell (PowerShell)
Event Properties
Attach Task To This Event...
Copy
Save Selected Events...
Refresh
Help


Event Viewer
File Action View Help
Event Properties - Event 400, PowerShell (PowerShell)
General Details
Engine state is changed from None to Available.
Details:
NewEngineState=Available
PreviousEngineState=None
SequenceNumber=13
Log Name: Windows PowerShell
Source: PowerShell (PowerShell) Logged: 04-05-2023 15:29:43
Event ID: 400 Task Category: Engine Lifecycle
Level: Information Keywords: Classic
User: N/A Computer: Dhaval
OpCode: Info
More Information: Event Log Online Help
Copy
Close
Actions
Windows PowerShell
Event 400, PowerShell (PowerShell)



Result analysis:

Summary of Administrative Events			
Event Type	**Last Hour**	**24 hour**	**7 days**
Critical	0	0	1
Error	6	25	266
Warning	11	135	766
Information	273	2373	10099
Audit Success	950	6416	28120
Audit Failure	0	2	5

Conclusion:

- With event view we can see different events that workers in our system. With the help of event view we can also see a different logs in the specific groups and specific filter work we can see what lock contains and the information which is passed through it.

Future scope:

- Even if you can use by your system administrator or by the security person To check what kind of event occur in the system to prevent if there is any suspicious event is there and protect the system. We can also see a warning and error the logs like bonding logs error logs informational logs then audit logs.

Experiment : 2

Title: Installation and Demonstration of System Internal Tool (Process Explorer) for Data Classification by Process ID and Company Name

Objective:

The objective of this experiment is to install and demonstrate the usage of the System Internal Tool called Process Explorer. Additionally, we aim to classify data using process ID and company name information obtained from Process Explorer.

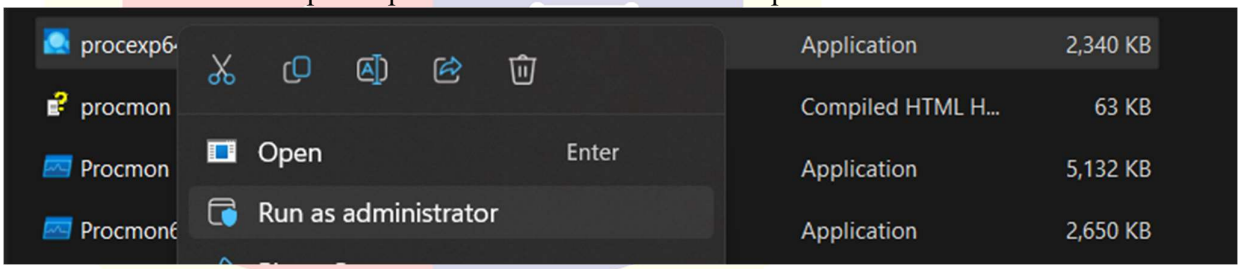
Requirements:

Sysinternal suite

Procedure/Experiment Steps:

1. Download Process Explorer:
    a. Open a web browser.
    b. Visit the official Microsoft website.
    c. Search for "Process Explorer" or Sysinternal suite and navigate to the official download page.
    d. Download the appropriate version that compatible with your Windows operating system.
    e. Save the downloaded file.

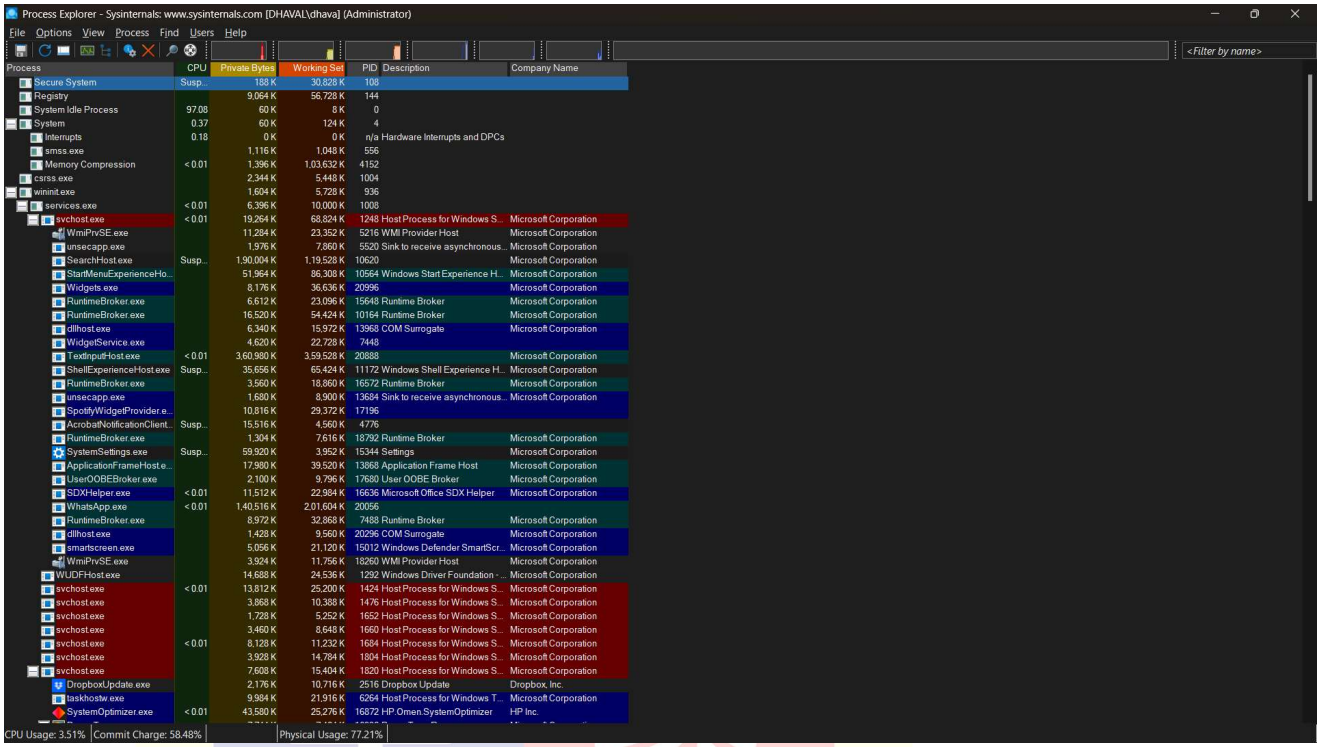
2. Launch Process Explorer:
    a. Navigate to the installation location of Process Explorer.
    b. Double-click on the "procexp.exe" file to launch Process Explorer.



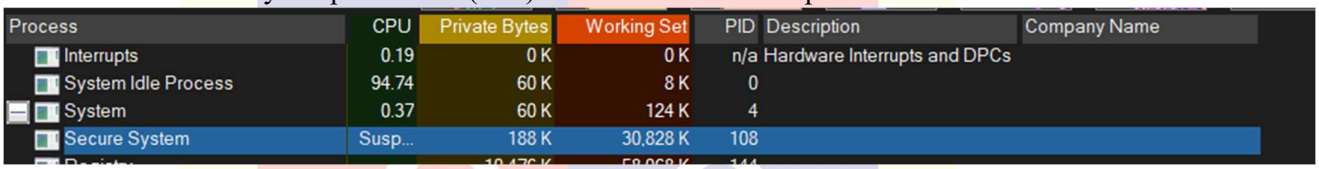
    c. It will ask for the installation for the first time only.

3. Explore Process Explorer Interface:
    a. The Process Explorer interface, which provides a comprehensive view of running processes on your system.

    b. Observe the various columns displayed, including process name, process ID, company name, CPU usage, memory usage, etc.



4. Data Classification by Process ID:
    a. Identify the process ID (PID) column in Process Explorer.



    b. Analyse the PID values associated with different processes.
    c. Classify or categorize the data based on the process IDs. For example, you can group processes by their PID ranges or assign specific actions based on PID values.

5. Data Classification by Company Name:
    a. Identify the company name column in Process Explorer.

b. Analyse the company names associated with different processes.
c. Classify or categorize the data based on the company names. For example, you can group processes by the company name or apply specific policies based on the company's reputation.

Result:

The obtained results from Process Explorer allow for efficient data classification based on process ID and company name. By grouping processes using process ID or company name, you can gain insights into system activity and make informed decisions regarding resource allocation, security policies, and more.

Conclusion:

In conclusion process Explorer is a powerful tool for monitoring and managing processes on a Windows system. The ability to classify data based on process ID and company name and other perameter enhances process analysis and decision-making capabilities, contributing to improved system performance and security.

Future Scope:

1. Further research and experimentation can explore additional criteria for data classification, such as process hierarchy, resource utilization, or network activity.
2. Integration of Process Explorer data with other security tools or automation scripts can enhance system monitoring and incident response capabilities.
3. Investigating process anomalies or suspicious behaviour abased on process ID and company name can lead to the development of advanced threat detection techniques.
4. Continual updates and enhancements to Process Explorer by Microsoft may introduce new features and functionalities for data classification and analysis.

Experiment : 3

Title: With the help of disk monitoring identify the read and write process having length>5.

Objective:

The objective of this project is to utilize disk monitoring software to identify read and write processes that have a length greater than 5. By analyzing the data collected through disk monitoring, we aim to identify processes with significant read and write operations on the disk.

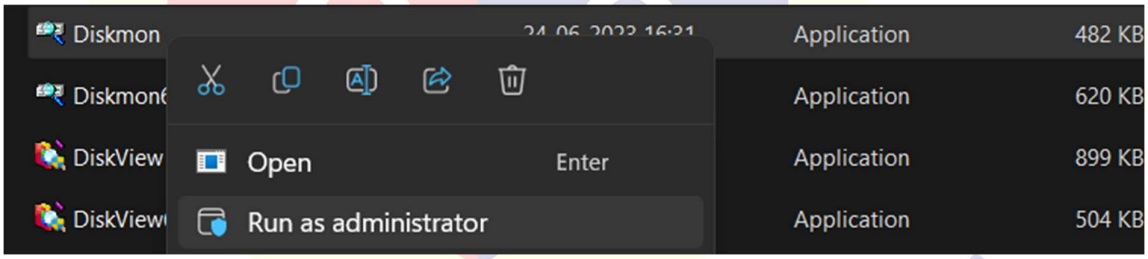
Requirements:

Sysinternal suite
Diskmon.exe

Procedure/Experiment Steps:

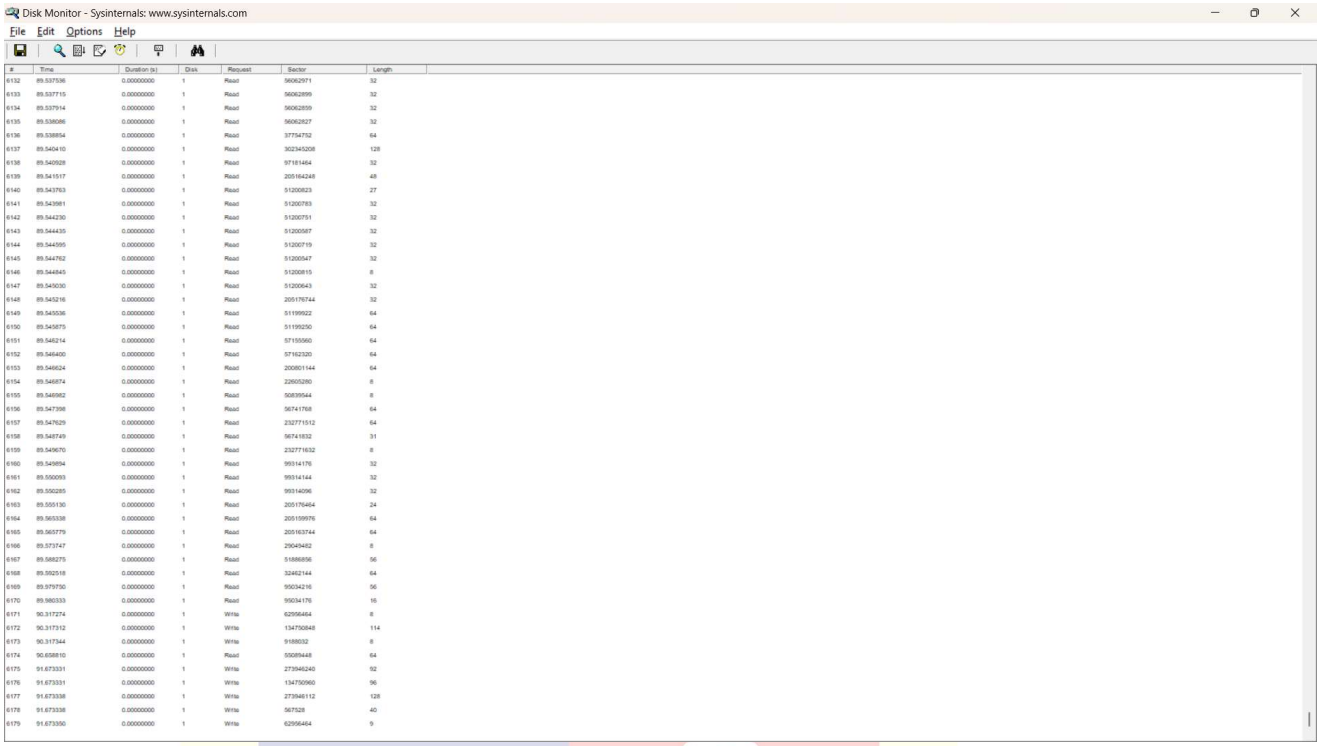
1. Download Disk Monitor:
    a. Open a web browser.
    b. Visit the official Microsoft website.
    c. Search for "Disk Monitor" or Sysinternal suite and navigate to the official download page.
    d. Download the appropriate version that compatible with your Windows operating system.
    e. Save the downloaded file.

2. Launch Disk Monitor:
    a. Navigate to the installation location of Disk Monitor.
    b. Double-click on the "Diskmon.exe" file to launch Disk Monitor.

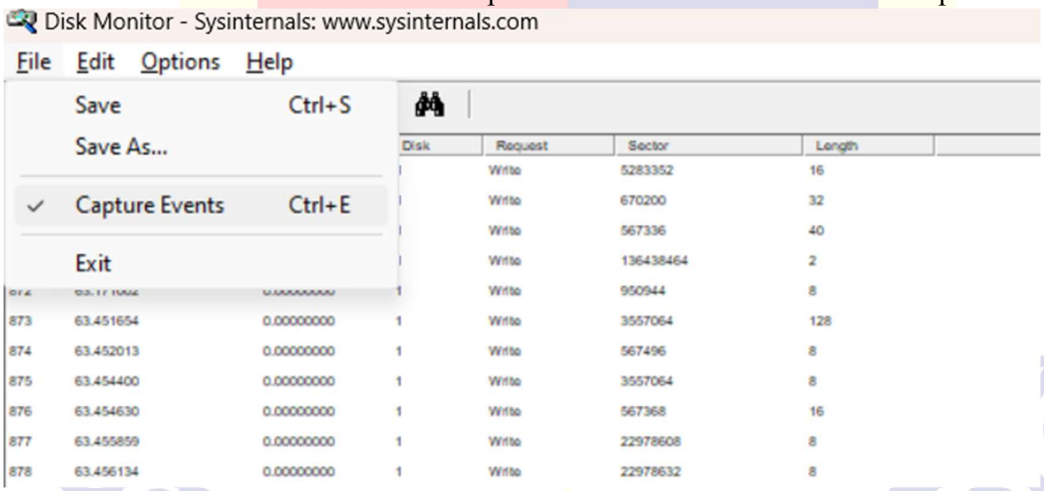


    c. It will ask for the installation for the first time only.

3. Explore Disk Monitor Interface:
    a. The Disk Monitor interface



    b. It automatic start capture the logs and data
    c. Go to file and click on capture Event or Press CTRL + E to stop



d. As we can see here all event in Read and write mode

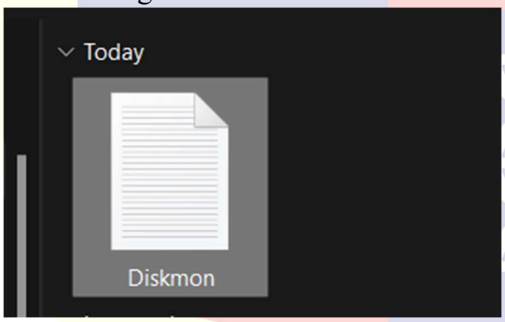
Disk Monitor - Sysinternals: www.sysinternals.com

File Edit Options Help

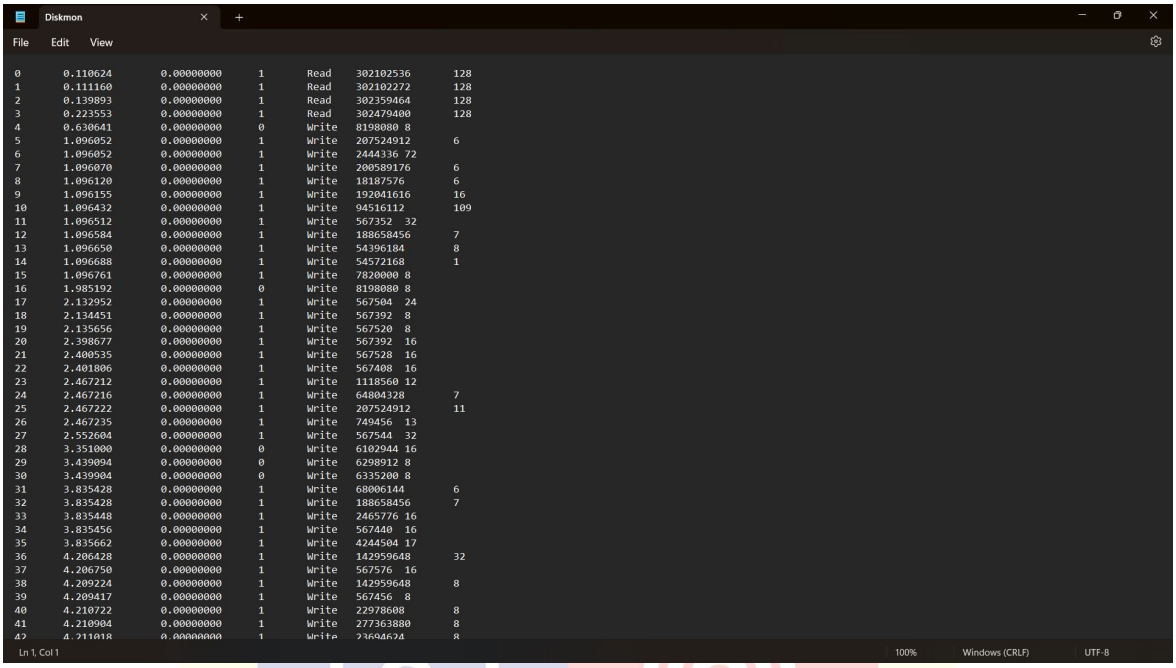
#	Time	Durati...	Disk	Request	Sector	Length
182	16.836802	0.00000...	1	Write	53680296	7
183	18.196709	0.00000...	1	Write	53680296	11
184	19.552763	0.00000...	1	Write	53680472	2
185	19.552765	0.00000...	1	Write	567464	16
186	19.553026	0.00000...	1	Write	42435088	2
187	19.553061	0.00000...	1	Write	42233960	5
188	19.809072	0.00000...	1	Write	567344	16
189	19.811515	0.00000...	1	Write	51168072	8
190	20.922979	0.00000...	1	Write	53680304	4
191	21.389277	0.00000...	1	Read	3015256	24
192	22.286477	0.00000...	1	Write	62956512	5
193	22.286578	0.00000...	1	Write	53680472	4
194	23.653686	0.00000...	1	Write	5283304	48
195	23.653686	0.00000...	1	Write	567480	16
196	23.653840	0.00000...	1	Write	42233960	5
197	23.653878	0.00000...	1	Write	42435088	2
198	24.821141	0.00000...	1	Write	669144	144
199	24.821256	0.00000...	1	Write	567336	8
200	24.822278	0.00000...	1	Write	567328	8
201	25.006542	0.00000...	1	Write	53680472	6
202	25.006557	0.00000...	1	Write	68004696	2
203	25.006565	0.00000...	1	Write	65374656	67
204	25.682584	0.00000...	1	Read	203876802	40
205	25.683704	0.00000...	1	Read	209896563	32
206	26.373570	0.00000...	1	Write	53680304	6
207	27.733488	0.00000...	1	Write	567464	16
208	27.734502	0.00000...	1	Write	13557200	8
209	27.734512	0.00000...	1	Write	50775192	16
210	27.734656	0.00000...	1	Write	51083096	8
211	27.734736	0.00000...	1	Write	50775216	8
212	27.734762	0.00000...	1	Write	2452520	8
213	27.734781	0.00000...	1	Write	142430880	11
214	27.734816	0.00000...	1	Write	51083504	8
215	27.734835	0.00000...	1	Write	2452488	8
216	27.734848	0.00000...	1	Write	50775344	8
217	27.734909	0.00000...	1	Write	142430872	8
218	27.734941	0.00000...	1	Write	51083680	16
219	27.734963	0.00000...	1	Write	50775392	8
220	27.734979	0.00000...	1	Write	103287976	8
221	27.734989	0.00000...	1	Write	10886568	8
222	27.735011	0.00000...	1	Write	51084256	16
223	27.735027	0.00000...	1	Write	50775440	16
224	27.735046	0.00000...	1	Write	1084208	8
225	27.735059	0.00000...	1	Write	7673024	8
226	27.735107	0.00000...	1	Write	50775520	8
227	27.735114	0.00000...	1	Write	51084288	32
228	27.735114	0.00000...	1	Write	1645528	8
229	27.735130	0.00000...	1	Write	7673104	8

e. We can see Time, Duration, Disk, Request, Sector, Length

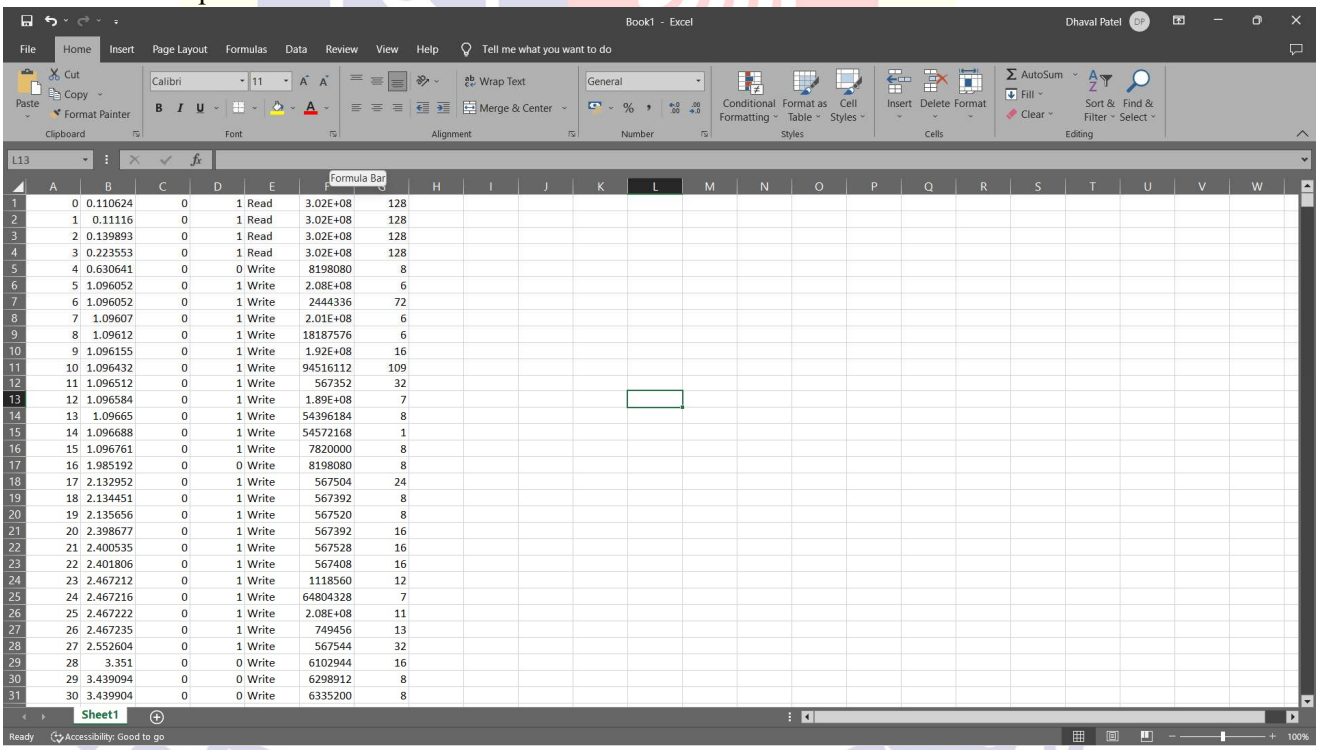
f. Save the log file



g. Locket the file copy the data



h. open in excel



	A	B	C	D	E	F	G
1	0	0.110624	0	1	Read	3.02E+08	128
2	1	0.11116	0	1	Read	3.02E+08	128
3	2	0.139893	0	1	Read	3.02E+08	128
4	3	0.223553	0	1	Read	3.02E+08	128
5	4	0.630641	0	0	Write	8198080	8
6	5	1.096052	0	1	Write	2.08E+08	6
7	6	1.096052	0	1	Write	2444336	72
8	7	1.09607	0	1	Write	2.01E+08	6
9	8	1.09612	0	1	Write	18187576	6
10	9	1.096155	0	1	Write	1.92E+08	16
11	10	1.096432	0	1	Write	94516112	109
12	11	1.096512	0	1	Write	567352	32
13	12	1.096584	0	1	Write	1.89E+08	7
14	13	1.09665	0	1	Write	54396184	8
15	14	1.096688	0	1	Write	54572168	1
16	15	1.096761	0	1	Write	7820000	8
17	16	1.985192	0	0	Write	8198080	8
18	17	2.132952	0	1	Write	567504	24
19	18	2.134451	0	1	Write	567392	8
20	19	2.135656	0	1	Write	567520	8
21	20	2.398677	0	1	Write	567392	16
22	21	2.400535	0	1	Write	567528	16
23	22	2.401806	0	1	Write	567408	16
24	23	2.467212	0	1	Write	1118560	12
25	24	2.467216	0	1	Write	64804328	7
26	25	2.467222	0	1	Write	2.08E+08	11
27	26	2.467235	0	1	Write	749456	13
28	27	2.552604	0	1	Write	567544	32
29	28	3.351	0	0	Write	6102944	16
30	29	3.439094	0	0	Write	6298912	8
31	30	3.439904	0	0	Write	6335200	8

i. Analyze the result

Result:

- Read and Write Process with length >5.

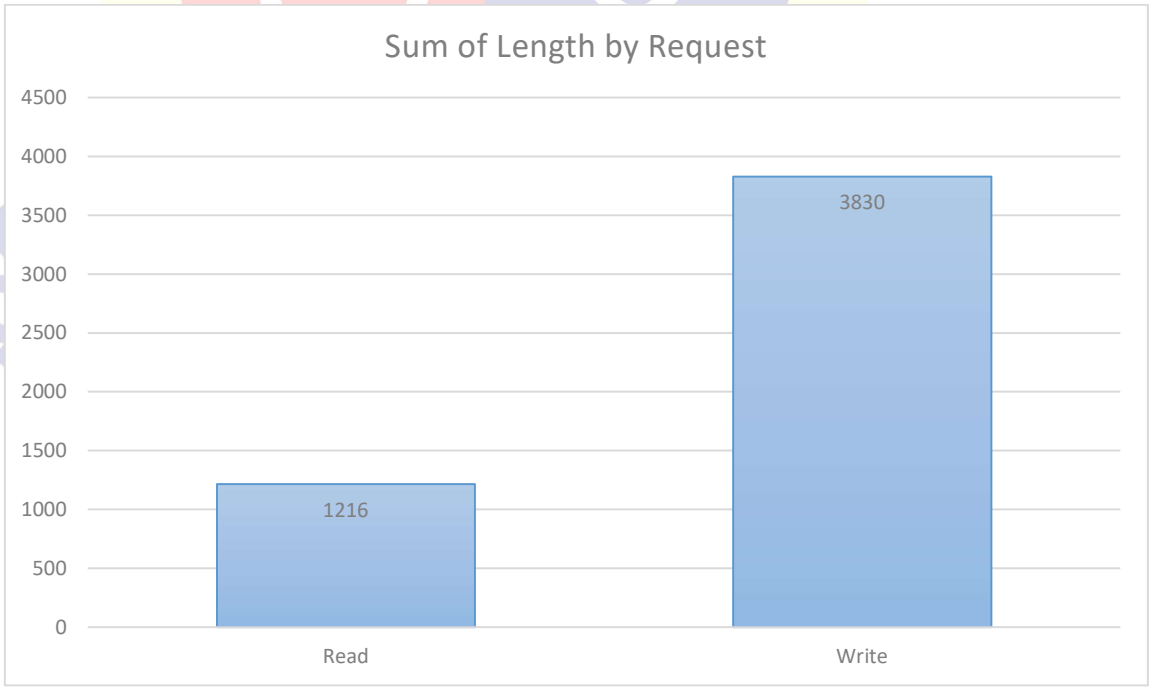
#	Time	Duration	Disk	Request	Sector	Length
85	24.997138	0	1	Write	64804568	7
1	8.642404	0	1	Write	101392440	8
17	10.544672	0	1	Write	567392	8
20	10.545294	0	1	Write	47474184	8

21	10.545326	0	1	Write	47474192	8
24	10.546761	0	1	Write	47474184	8
25	10.546978	0	1	Write	47474192	8
32	10.5489	0	1	Write	567520	8
33	10.549217	0	1	Write	567400	8
35	10.551006	0	1	Write	567528	8
37	10.551166	0	1	Write	567400	8
39	10.551573	0	1	Write	567528	8
40	10.551721	0	1	Write	80871376	8
41	10.551818	0	1	Write	80871384	8
42	10.552262	0	1	Write	567400	8
43	10.552373	0	1	Write	24583232	8
44	10.552491	0	1	Write	24583240	8
45	10.552678	0	1	Write	567528	8
47	10.55316	0	1	Write	24583232	8
48	10.553281	0	1	Write	24583240	8
49	10.553434	0	1	Write	567536	8
50	10.553618	0	1	Write	47474192	8
51	10.55377	0	1	Write	47474200	8
52	10.553827	0	1	Write	47474208	8
53	10.554253	0	1	Write	567408	8
54	10.554363	0	1	Write	24583232	8
55	10.554487	0	1	Write	24583240	8
56	10.554652	0	1	Write	567536	8
59	10.566633	0	1	Write	567544	8
70	18.891933	0	1	Write	567344	8
75	19.5396	0	1	Write	50971336	8
76	19.539738	0	1	Write	50971576	8
78	19.53999	0	1	Write	50971656	8
79	19.540114	0	1	Write	50974832	8
87	27.718742	0	1	Write	64804568	8
96	34.193014	0	1	Write	567424	8
104	35.889885	0	1	Write	567464	8
105	35.8928	0	1	Write	50984512	8
106	35.892826	0	1	Write	18045224	8
108	35.892883	0	1	Write	65642656	8
109	35.892938	0	1	Write	8168040	8
110	35.893005	0	1	Write	148436648	8
111	35.893094	0	1	Write	51008976	8
112	35.893142	0	1	Write	8167600	8
113	35.893181	0	1	Write	65655000	8
114	35.893187	0	1	Write	50775480	8
115	35.893206	0	1	Write	51009288	8
116	35.893242	0	1	Write	27761576	8
117	35.893254	0	1	Write	17904984	8
118	35.893274	0	1	Write	50775568	8
120	35.893322	0	1	Write	29124384	8
121	35.893325	0	1	Write	27761712	8

122	35.893357	0	1	Write	51009440	8
124	35.893379	0	1	Write	27761792	8
126	35.893414	0	1	Write	51009488	8
127	35.893462	0	1	Write	50775808	8
128	35.893488	0	1	Write	27761344	8
129	35.893507	0	1	Write	51009896	8
131	35.893536	0	1	Write	50776736	8
132	35.893568	0	1	Write	27761488	8
133	35.893658	0	1	Write	50776784	8
136	35.893722	0	1	Write	3683248	8
137	35.893734	0	1	Write	50776960	8
138	35.89377	0	1	Write	29124032	8
139	35.893789	0	1	Write	51010448	8
140	35.893805	0	1	Write	3683272	8
141	35.893821	0	1	Write	50777424	8
143	35.893853	0	1	Write	51074312	8
144	35.893872	0	1	Write	1814872	8
145	35.893885	0	1	Write	83221488	8
146	35.893904	0	1	Write	29124088	8
147	35.89392	0	1	Write	51078792	8
148	35.893939	0	1	Write	1645528	8
149	35.893958	0	1	Write	83226456	8
151	35.893994	0	1	Write	51085920	8
152	35.894019	0	1	Write	872208	8
153	35.894029	0	1	Write	50773824	8
156	35.894096	0	1	Write	5058712	8
157	35.894112	0	1	Write	50773840	8
159	35.894154	0	1	Write	51168072	8
160	35.894176	0	1	Write	16548600	8
163	35.894384	0	1	Write	103287976	8
164	35.894406	0	1	Write	200485976	8
167	35.894547	0	1	Write	1084208	8
168	35.894582	0	1	Write	200489400	8
169	35.894621	0	1	Write	50773984	8
171	35.894832	0	1	Write	280650632	8
173	35.89489	0	1	Write	50774064	8
175	35.895002	0	1	Write	279925152	8
176	35.895027	0	1	Write	43554632	8
177	35.89505	0	1	Write	50774168	8
178	35.895098	0	1	Write	80469344	8
179	35.895114	0	1	Write	24786184	8
180	35.89513	0	1	Write	50774232	8
181	35.895142	0	1	Write	21172040	8
182	35.895168	0	1	Write	80628872	8
183	35.895197	0	1	Write	50774272	8
184	35.895274	0	1	Write	7673024	8
185	35.895341	0	1	Write	50774304	8
186	35.895392	0	1	Write	10886568	8

64	16.813885	0	1	Write	64804560	9
90	31.815923	0	1	Write	64804568	10
5	9.998371	0	1	Write	72869200	12
26	10.54725	0	1	Write	24612512	16
27	10.54754	0	1	Write	24612528	16
28	10.547809	0	1	Write	24612512	16
29	10.547995	0	1	Write	24612512	16
36	10.551123	0	1	Write	24491056	16
38	10.551286	0	1	Write	2562160	16
46	10.553044	0	1	Write	567400	16
57	10.554891	0	1	Write	567408	16
63	16.8138	0	1	Write	14520456	16
68	18.891208	0	1	Write	567464	16
74	19.539421	0	1	Write	50971296	16
77	19.539867	0	1	Write	50971616	16
80	20.909389	0	1	Write	73912776	16
81	22.25939	0	1	Write	567384	16
86	27.718742	0	1	Write	567520	16
94	34.192336	0	1	Write	567544	16
119	35.893283	0	1	Write	51009400	16
123	35.893363	0	1	Write	50775784	16
142	35.893837	0	1	Write	29124064	16
155	35.894077	0	1	Write	51088632	16
158	35.89415	0	1	Write	29124248	16
161	35.894243	0	1	Write	29124272	16
165	35.894515	0	1	Write	29124304	16
174	35.89495	0	1	Write	80416888	16
91	33.165651	0	1	Write	567400	24
150	35.893978	0	1	Write	29124104	24
172	35.894867	0	1	Write	80416840	24
2	8.642429	0	1	Write	567496	32
10	10.539772	0	1	Read	27134568	32
11	10.540274	0	1	Read	27134536	32
12	10.540792	0	1	Read	27134224	32
13	10.541379	0	1	Read	54988880	32
14	10.54212	0	1	Read	54988752	32
15	10.542783	0	1	Read	54988720	32
130	35.893526	0	1	Write	29124472	32
162	35.894288	0	1	Write	50773872	32
166	35.894531	0	1	Write	50773912	32
107	35.892842	0	1	Write	148436656	40
154	35.894067	0	1	Write	29124144	40
8	10.53831	0	1	Read	54988040	48
16	10.5438	0	1	Read	27129584	48
72	19.538261	0	1	Write	567472	48
125	35.893402	0	1	Write	29124416	48
135	35.893699	0	1	Write	51010392	48
62	16.747099	0	1	Read	24129256	56

170	35.894784	0	1	Write	29124328	56
0	8.393994	0	1	Read	208032818	64
6	10.53689	0	1	Read	54987976	64
7	10.537573	0	1	Read	54988088	64
9	10.539061	0	1	Read	27130936	64
18	10.545037	0	1	Write	75053728	64
19	10.545158	0	1	Write	75053792	64
22	10.54593	0	1	Write	75060256	64
23	10.545934	0	1	Write	75060512	64
30	10.54828	0	1	Write	75051680	64
31	10.548511	0	1	Write	75051744	64
34	10.549894	0	1	Read	54987816	64
58	10.555232	0	1	Read	27129728	64
60	10.566827	0	1	Write	53299328	64
61	10.58215	0	1	Write	53298368	64
99	35.862893	0	1	Read	301720040	64
134	35.893686	0	1	Write	29124512	72
103	35.889744	0	1	Write	581920	128
65	18.170083	0	1	Write	581784	136
101	35.865245	0	1	Write	304010488	136
98	35.86288	0	1	Read	301720104	168
69	18.891597	0	1	Write	96081248	232
95	34.192707	0	1	Write	39353696	232
102	35.868669	0	1	Read	303151640	256
100	35.864877	0	1	Write	301779744	688



Result Analise:

After monitoring the disk activity and identifying the read and write processes with a length greater than 5, the following observations were made:

- The read processes listed above indicate the processes that performed data read operations with a length greater than 5.
- The write processes listed above indicate the processes that performed data write operations with a length greater than 5.
- By analysing these processes, further insights can be gained into potentially resource-intensive or suspicious activities on the system.

Conclusion:

- Disk monitoring can be a valuable technique to identify read and write processes with a length greater than 5. This information can be helpful in identifying potential performance bottlenecks, resource-intensive processes, or suspicious activities on the system.

Future scope:

- provide real-time alerts for processes with length > 5.
- Conducting a deeper analysis of the identified processes to understand their impact on system performance and security.
- Integrating the disk monitoring functionality with other security tools for comprehensive threat detection and prevention.

Experiment : 4

Title: Installation and demonstration of sawmill on windows OS. Generate a custom report.

Objective:

The objective of this experiment is to install and demonstrate the usage of Sawmill on a Windows operating system, specifically for generating a custom report.

Some information about "Sawmill":

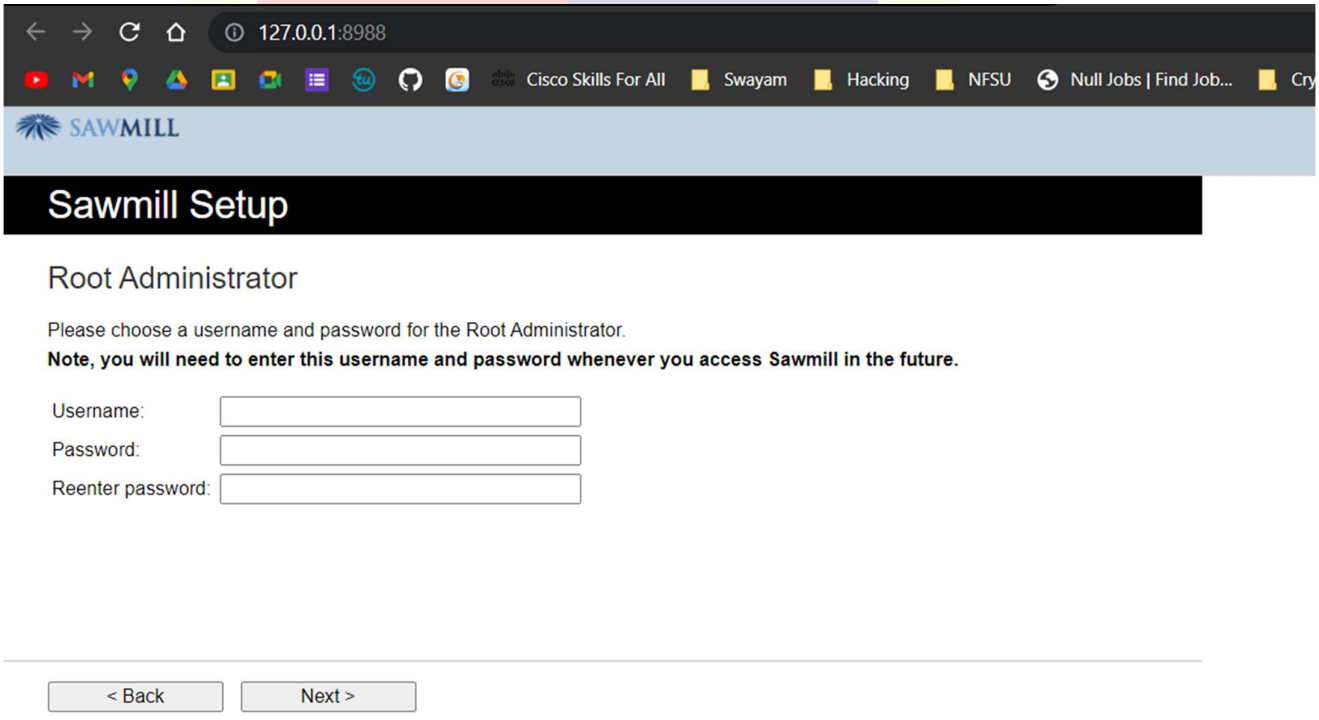
Sawmill software is used for log analysis and reporting, providing insights into website traffic and user behaviour. It processes log files and generates customizable reports, helping administrators and marketers understand website performance and security-related information.

Requirements:

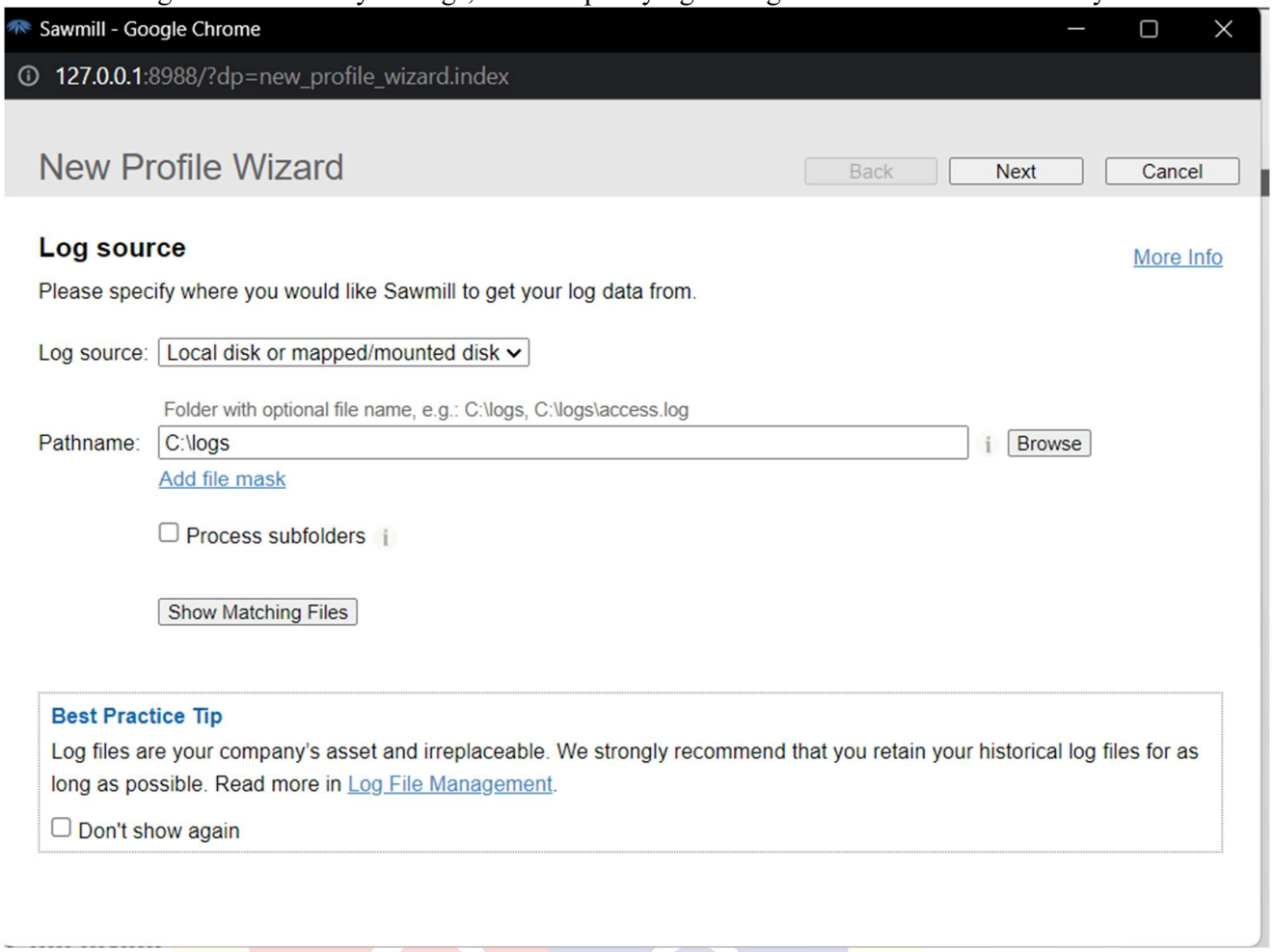
Sawmill installer

Procedure/Experiment Steps:

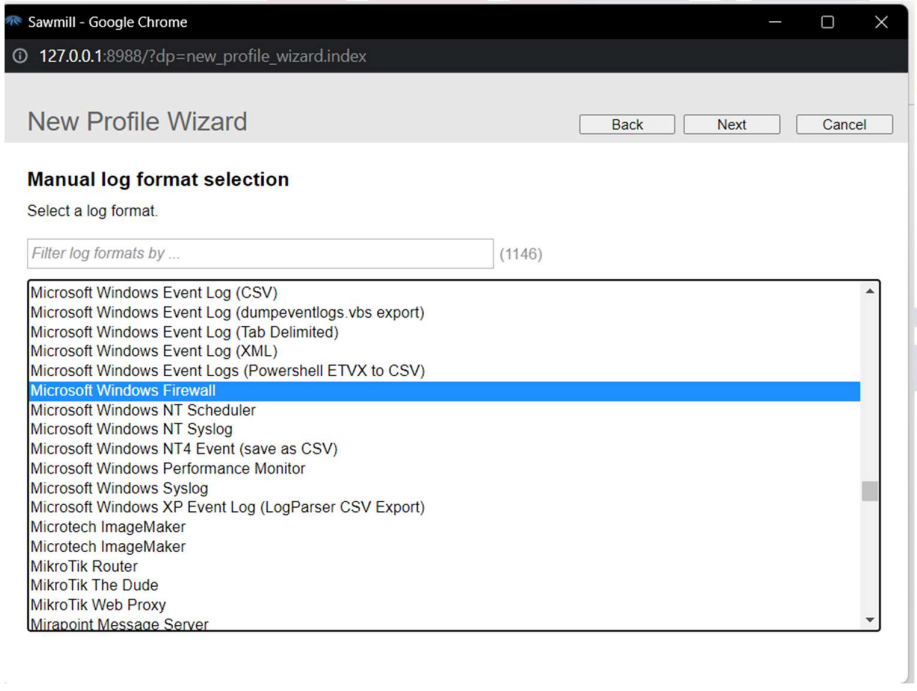
1. Download the latest version of the Sawmill software from the official website.
2. Launch the installer and follow the on-screen instructions to install Sawmill on the Windows OS.
3. Once the installation is complete it ask for first time Configuration detail like Language, Licence agreement, username and password we need to set for the first time.



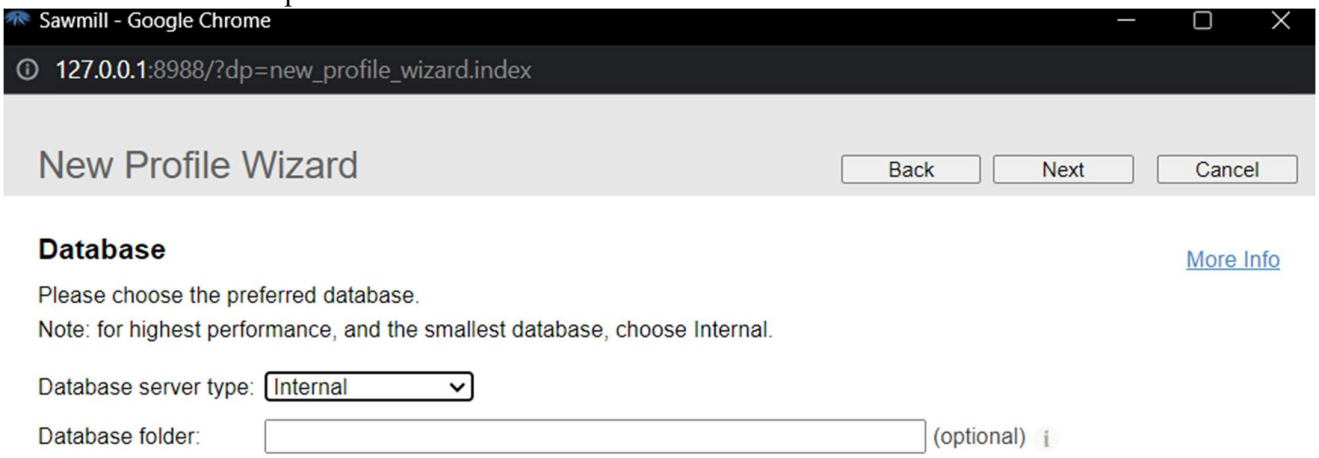
4. Configure the necessary settings, such as specifying the log file or data source for analysis.

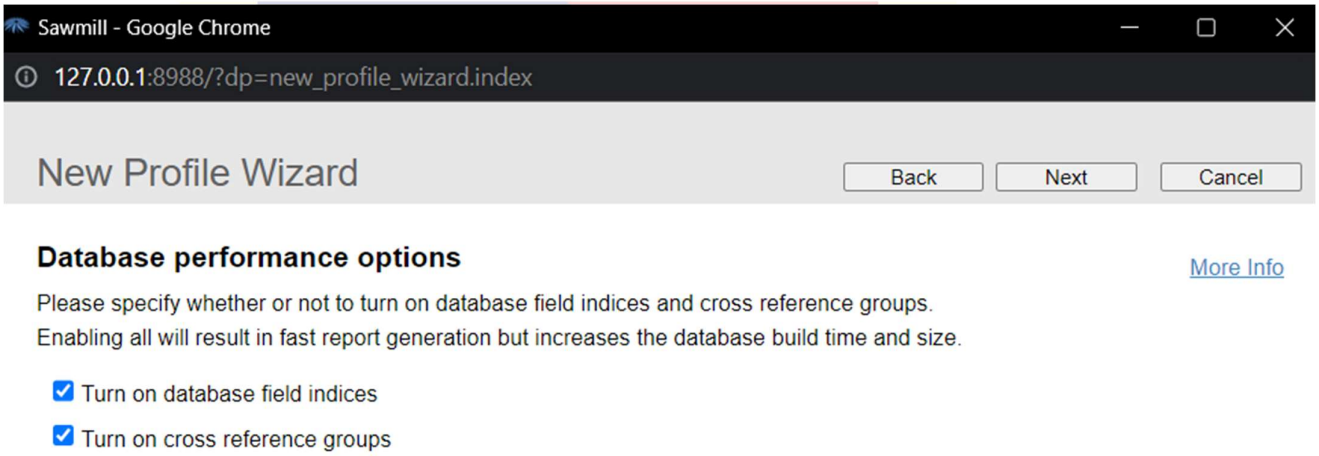


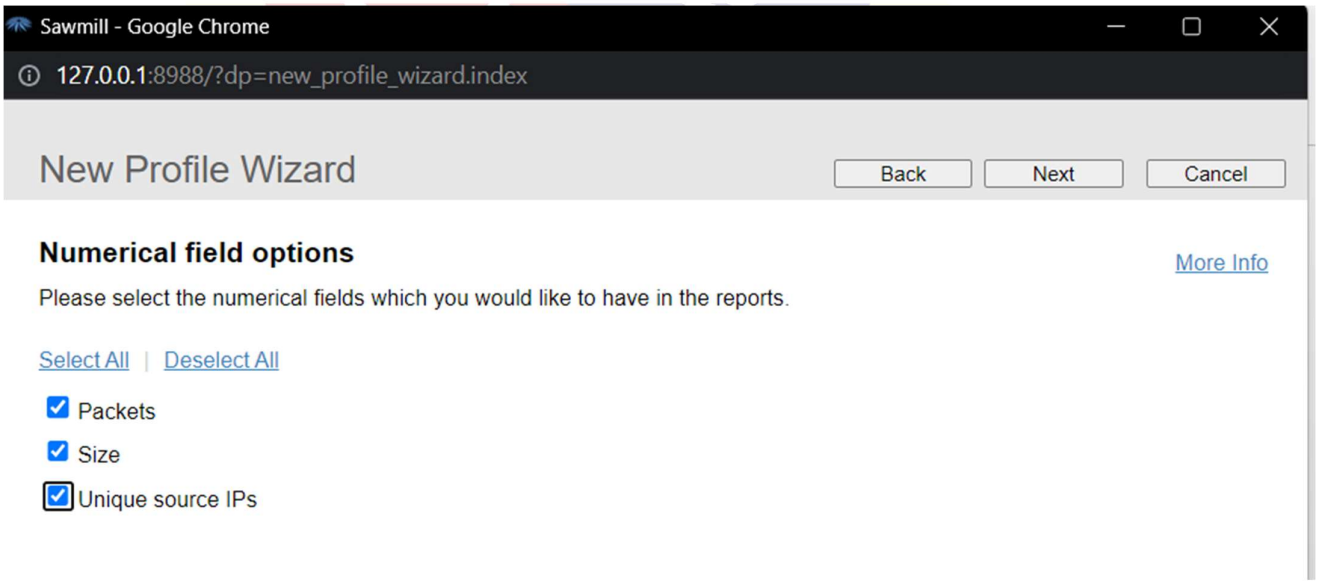
5. Choose log file format to import the log data.

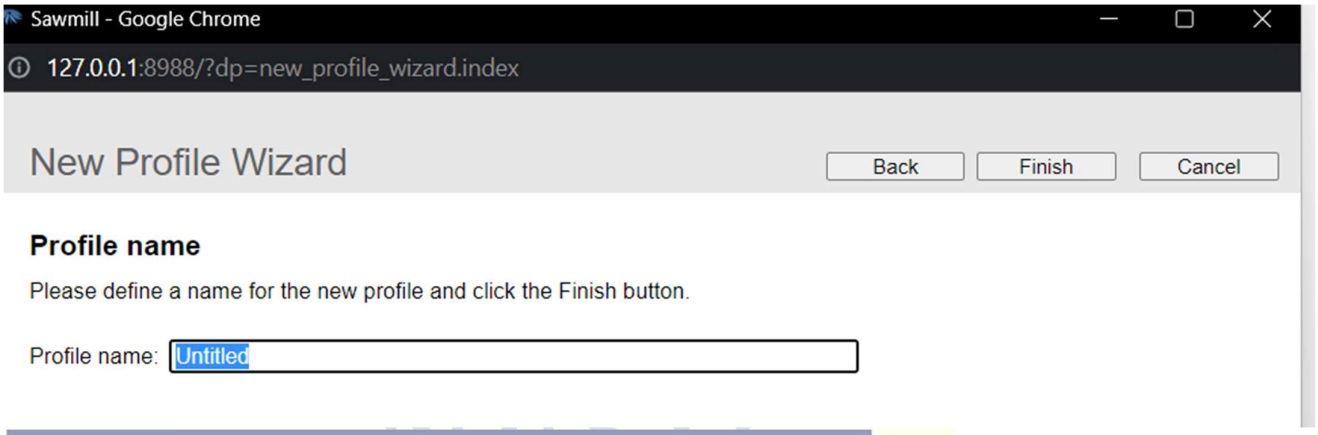


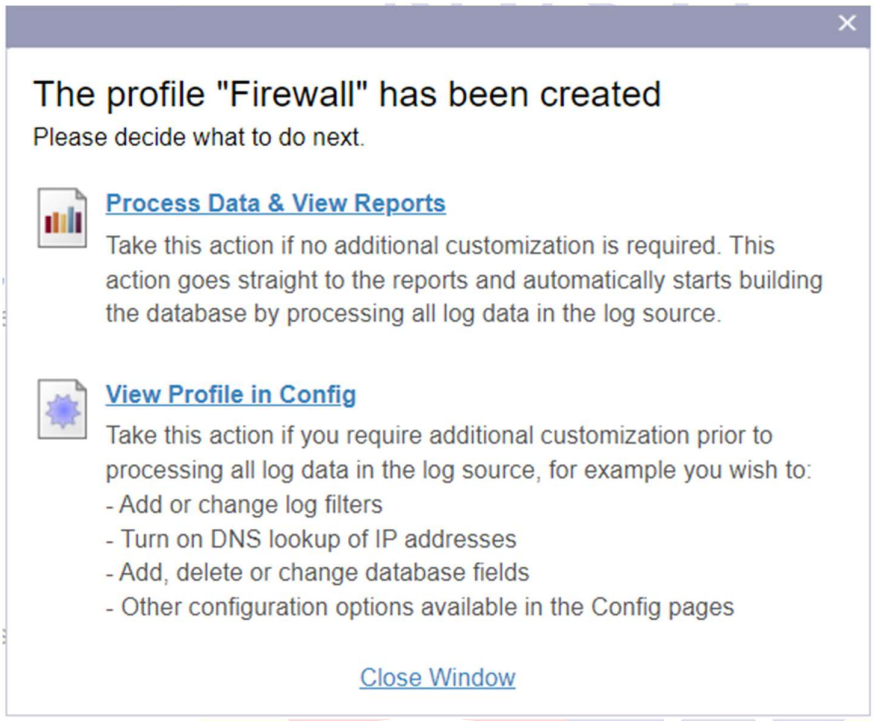
6. Set the appropriate log file parameters, including file location, log format, and any specific customization options.



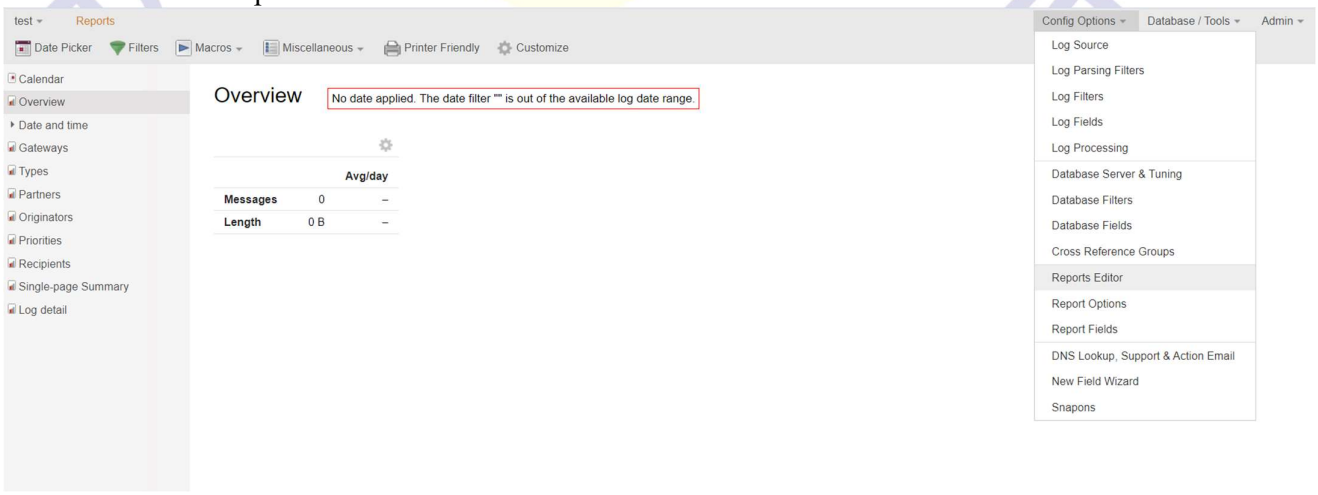




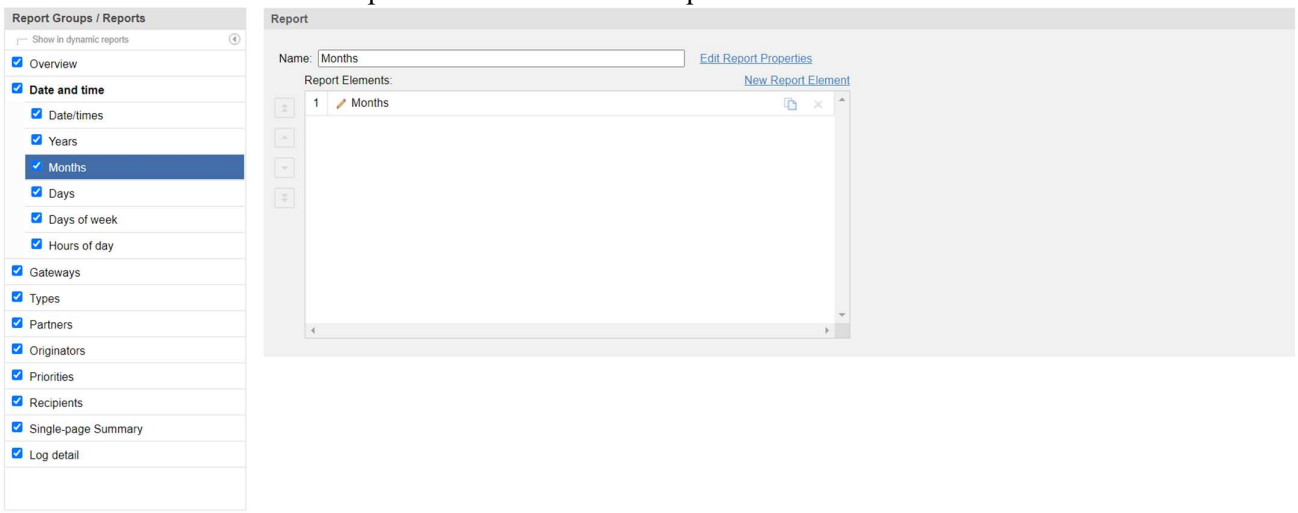




7. Initiate the log data import process to populate the Sawmill database.
8. Once the data import is complete, navigate to the reporting section within Sawmill.
9. Select the desired report customization options, including specific data fields, filters, date ranges, and visualization preferences.



10. Generate the custom report based on the selected parameters.



11. Review and analyze the generated custom report for insights and information.

Result:

The custom report generated from Sawmill provides valuable insights and analysis based on the selected parameters. It allows for in-depth exploration and understanding of the log data, assisting in identifying patterns, anomalies, and trends.

Conclusion:

The installation and usage of Sawmill on the Windows operating system enable the generation of custom reports, offering an effective approach to analyse and interpret log data. The custom report assists in understanding the logged information, identifying important trends, and making informed decisions.

Future Scope:

1. Exploring advanced customization options within Sawmill to generate more specific and targeted reports.
2. Integrating Sawmill with other security tools or log sources to consolidate and analyze data from multiple sources.
3. Conducting further research on log analysis methodologies and techniques to enhance the effectiveness of Sawmill reports.

Experiment: 5

Title: Installation and Configuration of Snort for Network Security and Protection against Cyber Threats

Objective:

The objective of this experiment is to install and configure Snort, an open-source intrusion detection and prevention system, for enhancing network security and providing protection against cyber threats.

Requirements:

Snort installer

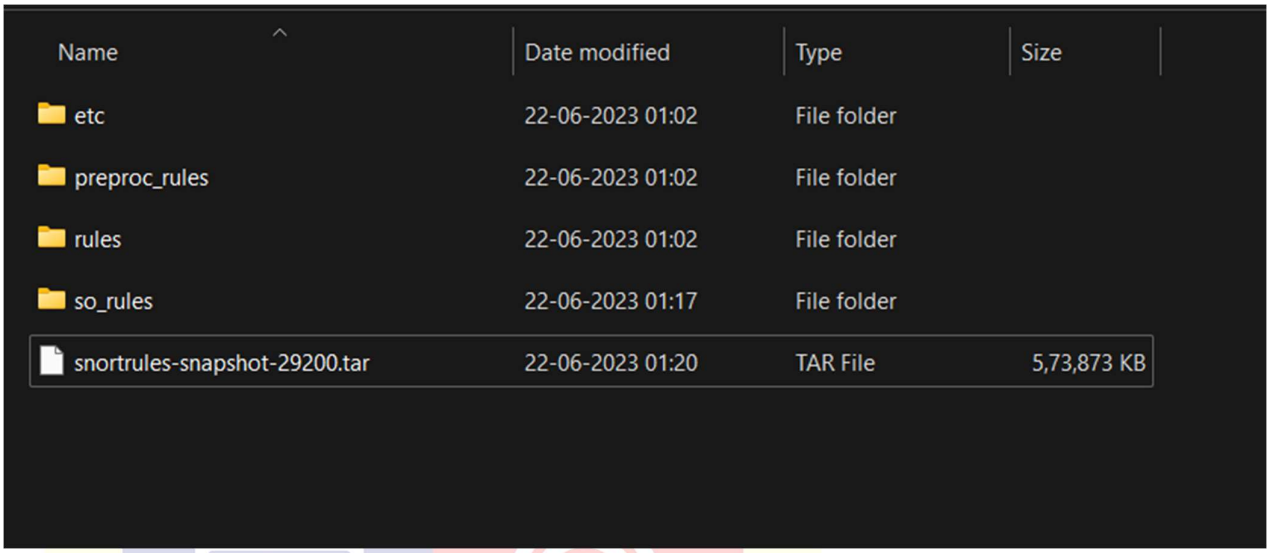
Procedure/Experiment Steps:

1. Download the latest version of Snort from the official website.
2. Launch the installer and follow instructions to install Snort.
3. Install Npcap because it's require for snort.
4. After installing Snort and Npcap. In command prompt open c:\ drive enter these commands in Command prompt to check snorts working
    a. cd snort
    b. cd bin
    c. snort -v

```
C:\Users\dhava>cd ..

C:\Users>cd ..

C:\>cd Snort

C:\Snort>cd bin

C:\Snort\bin>snort
Running in packet dump mode

        --== Initializing Snort ==--
Initializing Output Plugins!
pcap DAQ configured to passive.
The DAQ version does not support reload.
Acquiring network traffic from "\Device\NPF_{AE347C8D-8D5E-4A4A-A887-CDE39C0AA904}".
Decoding Ethernet

        --== Initialization Complete ==--

           -*> Snort! <*-
  ,,_      Version 2.9.20-WIN64 GRE (Build 82)
 o"  )~    By Martin Roesch & The Snort Team: http://www.snort.org/contact#team
  ''''     Copyright (C) 2014-2022 Cisco and/or its affiliates. All rights reserved.
           Copyright (C) 1998-2013 Sourcefire, Inc., et al.
           Using PCRE version: 8.10 2010-06-25
           Using ZLIB version: 1.2.11

Commencing packet processing (pid=9352)
```

    d. As we can see snort installed successfully
5. After installing Snort on Windows 10, Another important step to get started with Snort is configuring
    a. Go to "https://www.snort.org/downloads/#rule-downloads" and download latest snort rule file

b. Extract 3 folders from the downloaded snortrules-snapshot-29200.tar folder into the Snorts corresponding folders in C drive.



Name	Date modified	Type	Size
etc	22-06-2023 01:02	File folder	
preproc_rules	22-06-2023 01:02	File folder	
rules	22-06-2023 01:02	File folder	
so_rules	22-06-2023 01:17	File folder	
snortrules-snapshot-29200.tar	22-06-2023 01:20	TAR File	5,73,873 KB

c. rules folder contains the rules files and the most important local.rules file. Which we will use to enter all our rules.

d. etc folder contains all configuration files and the most important file is snort.conf file which we will use for configuration

6. Now open the snort.conf file through the notepad++ editor or any other text editor to edit configurations of snort to make it work like we want it to.

a. Setup the network addresses you are protecting

```
# Setup the network addresses you are protecting
ipvar HOME_NET 192.168.217.1
```

b. define the directory for our rules and preproc rules folder

```
# other variables, these should not be modified
ipvar AIM_SERVERS
[64.12.24.0/23,64.12.28.0/23,64.12.161.0/24,64.12.163.0/24,64.12.200.0/24,205.188.3.0/24,205.188.5.0/24,205.188.7.0/24,205.188.9.0/24,205.
188.153.0/24,205.188.179.0/24,205.188.248.0/24]

# Path to your rules files (this can be a relative path)
# Note for Windows users:  You are advised to make this an absolute path,
# such as:  c:\snort\rules
var RULE_PATH C:\Snort\rules
var SO_RULE_PATH C:\Snort\so_rules
var PREPROC_RULE_PATH C:\Snort\preproc_rules

# If you are using reputation preprocessor set these
var WHITE_LIST_PATH ../rules
var BLACK_LIST_PATH ../rules
```

Ln 106, Col 45 | 100% | Unix (LF) | UTF-8

c. setup our white list and black list path it will be in our snorts' rule folder

```
# If you are using reputation preprocessor set these
var WHITE_LIST_PATH C:\Snort\rules
var BLACK_LIST_PATH C:\Snort\rules
```

d. enable log directory, so that we store logs in our log folder. Uncomment this line and set absolute path to log directory

```
# Configure default log directory for snort to log to.  For more information see snort -h command line options (-l)
#
# config logdir: C:\Snort\log
```

e. set the path to dynamic preprocessors and dynamic engine

```
# path to dynamic preprocessor libraries
dynamicpreprocessor directory C:\Snort\lib\snort_dynamicpreprocessor
```

f. do same thing for dynamic preprocessor engine

```
# path to base preprocessor engine
dynamicengine C:\Snort\lib\snort_dynamicengine
```

g. Converted back slashes to forward slashes in this entire step

```
##################################################
# Step #7: Customize your rule set
# For more information, see Snort Manual, Writing Snort Rules
#
# NOTE: All categories are enabled in this conf file
##################################################

# site specific rules
include $RULE_PATH/local.rules

include $RULE_PATH\app-detect.rules
include $RULE_PATH\attack-responses.rules
include $RULE_PATH\backdoor.rules
include $RULE_PATH\bad-traffic.rules
include $RULE_PATH\blacklist.rules
include $RULE_PATH\botnet-cnc.rules
include $RULE_PATH\browser-chrome.rules
include $RULE_PATH\browser-firefox.rules
include $RULE_PATH\browser-ie.rules
include $RULE_PATH\browser-other.rules
```

h. Again just convert forward slashes to backslashes and uncomment the lines below:

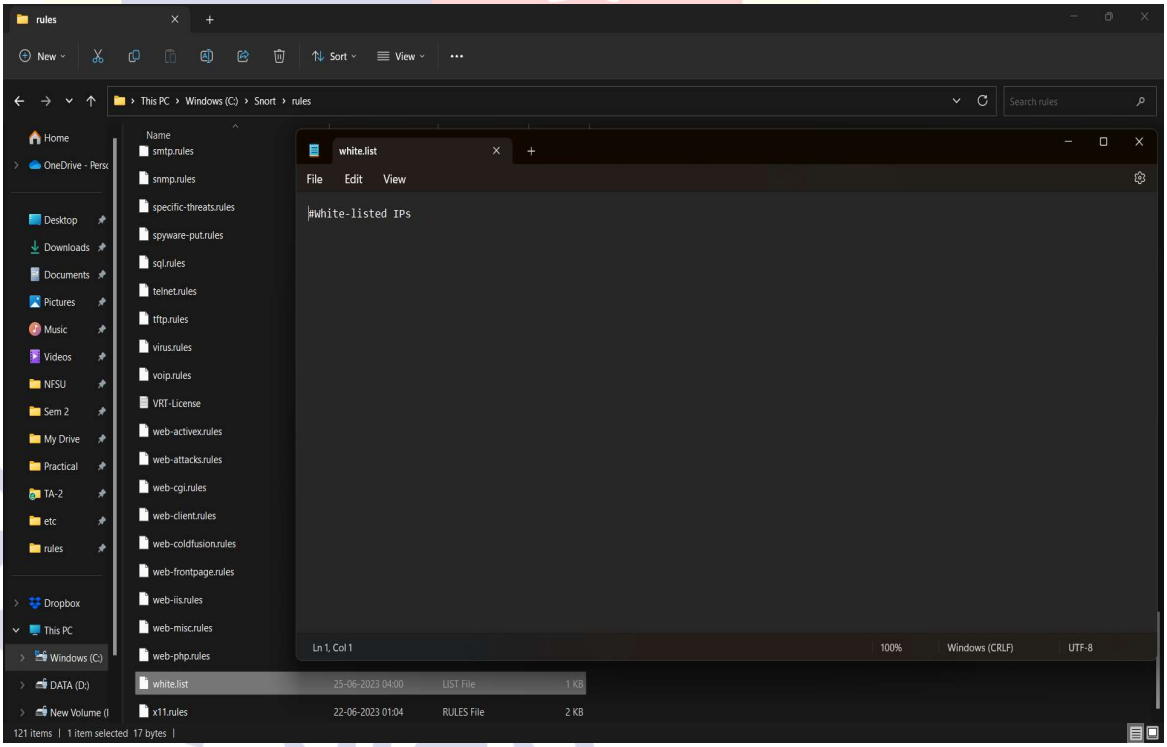
```
##################################################
# Step #8: Customize your preprocessor and decoder alerts
# For more information, see README.decoder_preproc_rules
##################################################

# decoder and preprocessor event rules
# include $PREPROC_RULE_PATH\preprocessor.rules
# include $PREPROC_RULE_PATH\decoder.rules
# include $PREPROC_RULE_PATH\sensitive-data.rules
```

i. Now we just need to verify the presence of this command at the bottom of snort.conf file.

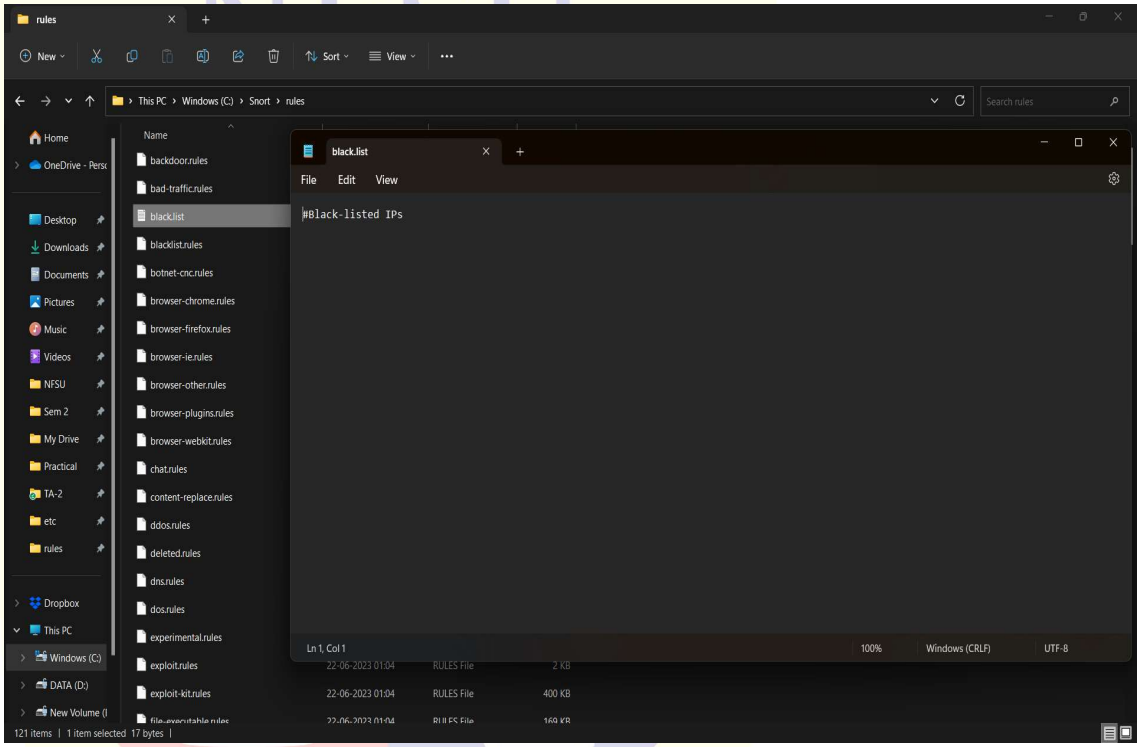
```
# include $SO_RULE_PATH/server-mysql.rules
# include $SO_RULE_PATH/server-oracle.rules
# include $SO_RULE_PATH/server-other.rules
# include $SO_RULE_PATH/server-webapp.rules

# Event thresholding or suppression commands. See threshold.conf
include threshold.conf
```

J. Click on Save file and save all changes to save the configuration file (snort.conf).

7. Now recalling the Step 13 white list , black list are not rules they are just the list of IP addresses labelled as black or white right now these files don't exist in our rule path which is why we have to create them manually , save them in this folder C:\Snort\rules.
   a. White-List
      i. Go to Notepad++ and create new file.
      ii. Comment it #White-listed IPs.
      iii. Name the file white.list and save the file.



b. Black-List
   i. Create another new file.
   ii. Comment it #Black-listed IPs.
   iii. Name the file black.list and save the file.



8. Now we test snort again by running Command prompt as admin. To check if it's running fine after all the configurations.

```
C:\>cd Snort

C:\Snort>cdc bin
'cdc' is not recognized as an internal or external command,
operable program or batch file.

C:\Snort>cd  bin

C:\Snort\bin>snort -v
Running in packet dump mode

        --== Initializing Snort ==--
Initializing Output Plugins!
pcap DAQ configured to passive.
The DAQ version does not support reload.
Acquiring network traffic from "\Device\NPF_{AE347C8D-8D5E-4A4A-A887-CDE39C0AA904}".
Decoding Ethernet

        --== Initialization Complete ==--

   ,,_     -*> Snort! <*-
  o"  )~   Version 2.9.20-WIN64 GRE (Build 82)
   ''''    By Martin Roesch & The Snort Team: http://www.snort.org/contact#team
           Copyright (C) 2014-2022 Cisco and/or its affiliates. All rights reserved.
           Copyright (C) 1998-2013 Sourcefire, Inc., et al.
           Using PCRE version: 8.10 2010-06-25
           Using ZLIB version: 1.2.11

Commencing packet processing (pid=17656)
```

- We can also the check the wireless interface cards from which we will be using snort by using the command below we can see the list of our wireless interface cards through entering this command in command prompt.

```
C:\Snort\bin>snort -W

   ,,_     -*> Snort! <*-
  o"  )~   Version 2.9.20-WIN64 GRE (Build 82)
   ''''    By Martin Roesch & The Snort Team: http://www.snort.org/contact#team
           Copyright (C) 2014-2022 Cisco and/or its affiliates. All rights reserved.
           Copyright (C) 1998-2013 Sourcefire, Inc., et al.
           Using PCRE version: 8.10 2010-06-25
           Using ZLIB version: 1.2.11

Index   Physical Address       IP Address      Device Name     Description
-----   ----------------       ----------      -----------     -----------
    1   00:00:00:00:00:00       disabled        \Device\NPF_{AE347C8D-8D5E-4A4A-A887-CDE39C0AA904}      WAN Miniport (Network Monitor)
    2   00:00:00:00:00:00       disabled        \Device\NPF_{6E8B2BD4-3908-40D3-A5C8-50DF4CFAC847}      WAN Miniport (IPv6)
    3   00:00:00:00:00:00       disabled        \Device\NPF_{150FEB8C-6343-483D-945B-7C5C2ED95E54}      WAN Miniport (IP)
    4   50:C2:E8:20:DD:39       192.168.1.2     \Device\NPF_{BE03E406-7418-4431-8F8A-959AD85F936F}      Realtek RTL8852AE WiFi 6 802.11ax PCIe Adapter
    5   00:50:56:C0:00:08       192.168.152.1   \Device\NPF_{96F93BF6-2220-460D-AD9F-EBC5A2B5AABA}      VMware Virtual Ethernet Adapter for VMnet8
    6   00:50:56:C0:00:01       192.168.217.1   \Device\NPF_{F71D68F7-3FAB-4C49-B3B2-56C33477C45E}      VMware Virtual Ethernet Adapter for VMnet1
    7   D2:C2:E8:20:DD:39       169.254.174.88  \Device\NPF_{BC2BE74E-8290-4697-88A1-F99EB5D8C647}      Microsoft Wi-Fi Direct Virtual Adapter #2
    8   52:C2:E8:20:DD:39       169.254.137.113 \Device\NPF_{0A2DB3A4-4770-43DD-95E3-078E30CE8677}      Microsoft Wi-Fi Direct Virtual Adapter
    9   00:00:00:00:00:00       0000:0000:0000:0000:0000:0000:0000:0000 \Device\NPF_Loopback    Adapter for loopback traffic capture
   10   A8:B1:3B:AC:BF:B5       169.254.43.55   \Device\NPF_{0FC8D253-2281-426C-A916-A4C94CBED46E}      Realtek Gaming GbE Family Controller

C:\Snort\bin>
```

Result:

By monitoring the network traffic using Snort, the system can detect and analyse various types of cyber threats, including intrusion attempts, malware activity, and suspicious network behaviours. The Snort alerts and log files provide valuable information for security analysts to investigate and respond to potential security incidents.

Conclusion:

The installation and configuration of Snort as an intrusion detection and prevention system significantly enhance network security and provide protection against cyber threats. Snort's ability to monitor and analyse network traffic helps in identifying and mitigating potential security risks in real-time.

Future Scope:

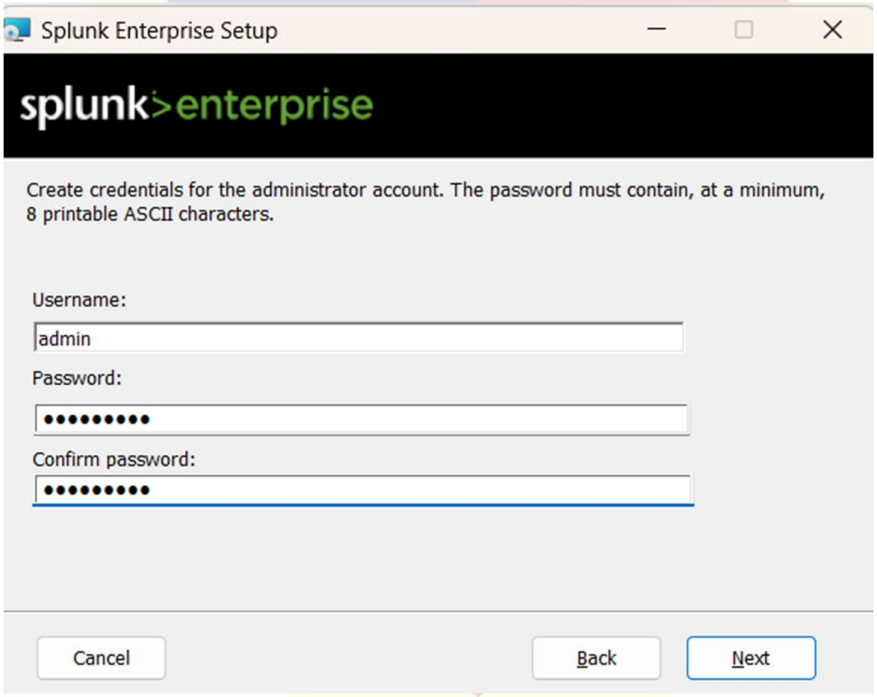
1. Continuously update the Snort ruleset to keep up with the latest threats and attack techniques.
2. Integrate Snort with other security tools, such as SIEM (Security Information and Event Management) systems, for centralized security monitoring and incident response.
3. Explore advanced features of Snort, such as protocol analysis and anomaly detection, to enhance network security capabilities.
4. Conduct regular audits and assessments to ensure the effectiveness of Snort in protecting the network against emerging cyber threats.

Experiment: 6
Title: Install and demonstrate Splunk for log analysis

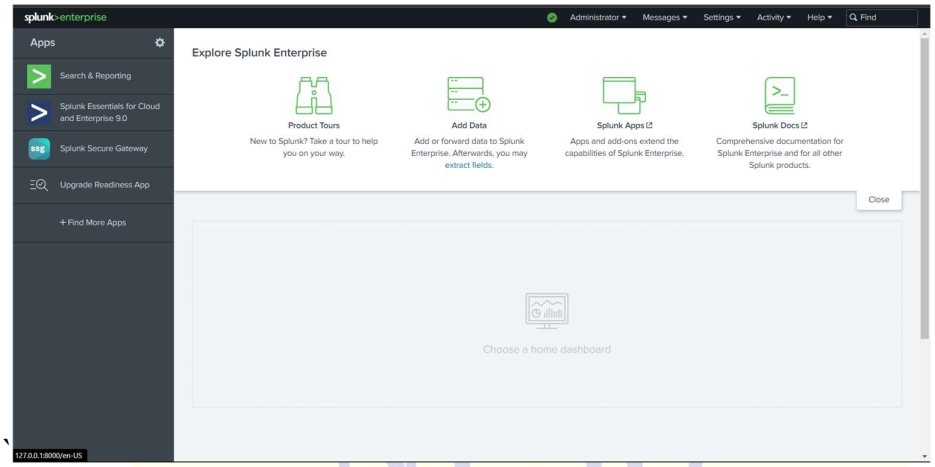
Objective:
The objective of this experiment is to install and demonstrate the usage of Splunk, a log analysis and monitoring platform, for efficient log analysis and gaining insights from log data.

Requirements:
Splunk installer

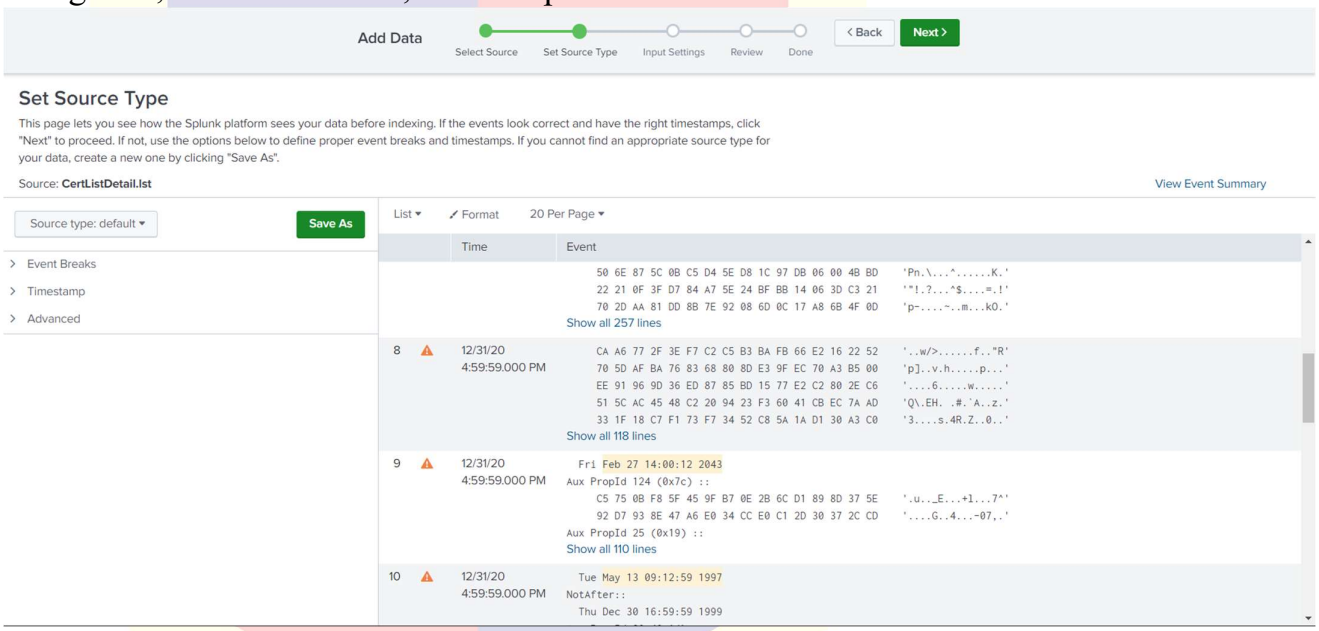
Procedure/Experiment Steps:
1. Download Splunk: Visit the official Splunk website and download the appropriate installation package for your operating system.
2. Install Splunk: Follow the provided instructions to install Splunk on your computer.



3. Launch Splunk: After installation, launch Splunk from the installed location or desktop shortcut or just go to http://localhost:8000.
4. Set up Splunk: During the initial setup, create an administrator account and configure basic settings.



5. Configure data inputs: Set up data inputs to ingest log data from various sources such as log files, network devices, or cloud platforms.



6. Index log data: Create and configure indexes to organize log data efficiently.
7. Search and analyze logs: Utilize Splunk's Search Processing Language (SPL) to search and analyze log data, troubleshoot issues, and extract insights.
8. Create visualizations and reports: Generate visualizations and reports to present log data in charts, graphs, and dashboards.
9. Demonstrate log analysis: Use real or simulated log data to showcase the effectiveness of Splunk in log analysis, anomaly detection, and troubleshooting.

Result:

By following the installation and demonstration steps, Splunk was successfully installed and utilized for log analysis. Log data from various sources was ingested and indexed, allowing for efficient searching and analysis. Splunk's search capabilities and visualizations provided valuable insights into the log data, enabling effective troubleshooting and decision-making.

Conclusion:

Splunk is a powerful log analysis and monitoring tool that simplifies log management and analysis processes. Its features, including data ingestion, searching, and visualization, allow for efficient log analysis and troubleshooting. By utilizing Splunk, organizations can enhance their log management practices, improve operational efficiency, and gain valuable insights from log data.

Future Scope:

1. Integration with additional data sources such as cloud platforms, IoT devices, or specific application logs.
2. Exploring advanced analytics and machine learning capabilities within Splunk for deeper insights and automation of log analysis processes.
3. Utilizing Splunk's security features for robust security monitoring, threat detection, and compliance reporting.
4. Leveraging collaboration features to facilitate knowledge sharing, teamwork, and reporting among different stakeholders.
5. Optimizing Splunk deployment for scalability and performance as log data volume increases, including distributed architecture and performance tuning techniques.

Experiment : 7

Title: Use Autopsy to recover file from the given data source. Present your details accordingly

Objective:

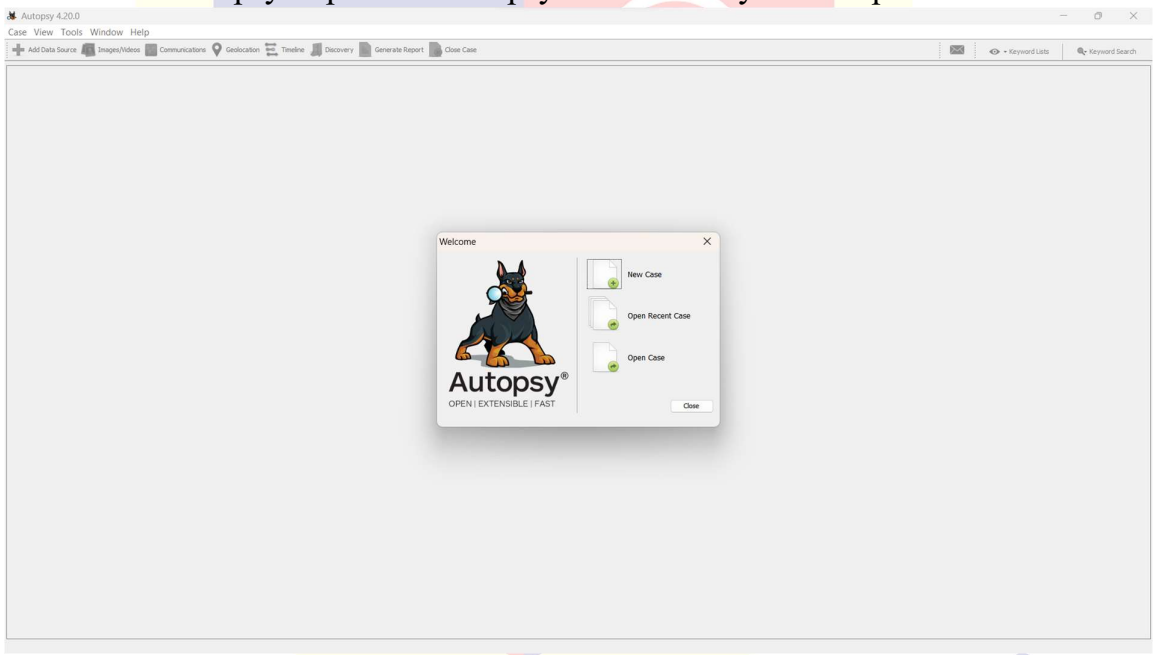
The objective of this experiment is to utilize Autopsy, a digital forensics tool, to recover a file from a specific data source.

Requirements:

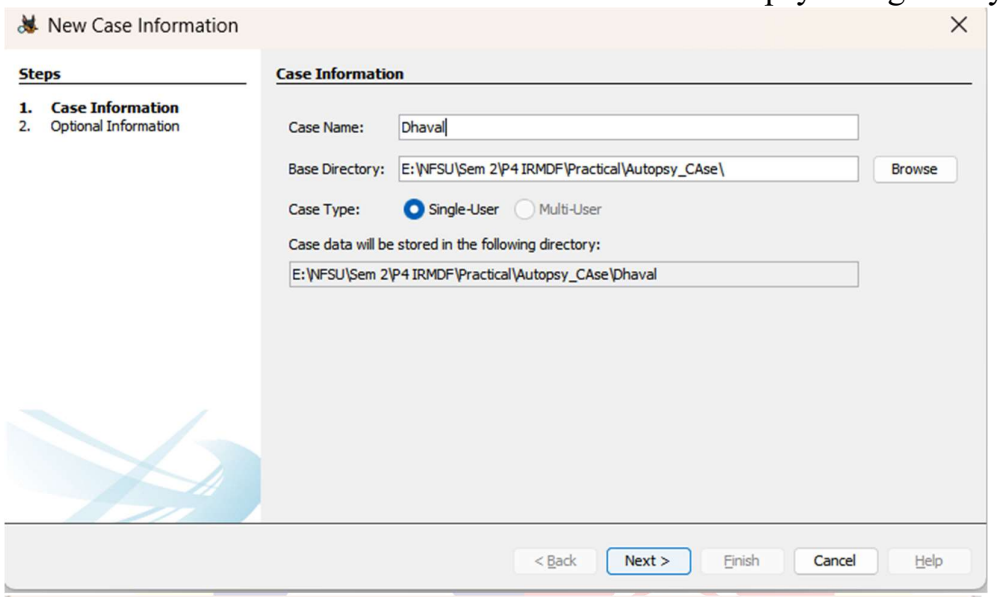
- Autopsy software installed
- Data source containing the target file for recovery (e.g., a storage device, disk image, or forensic image)

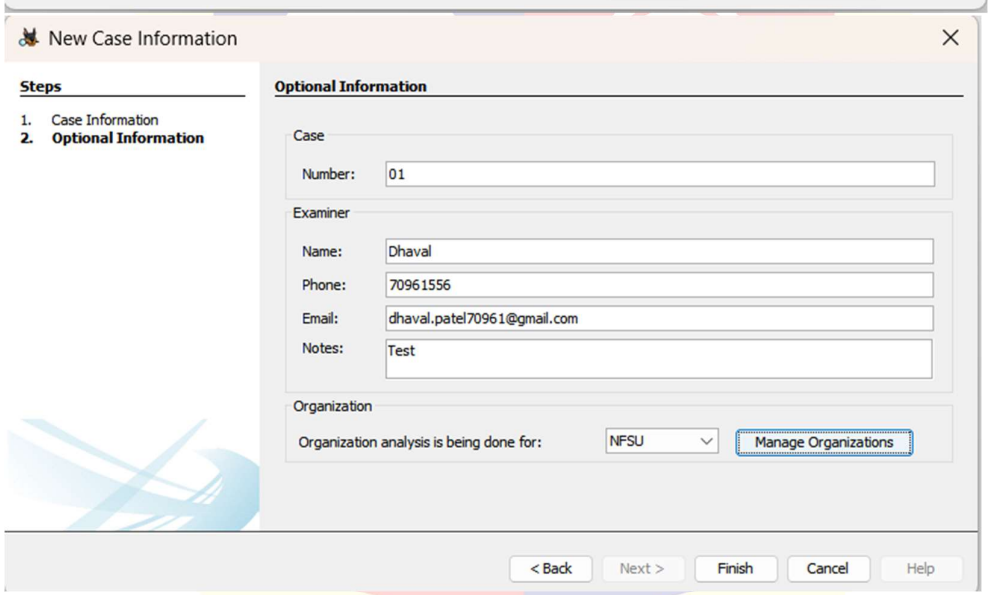
Procedure/Experiment Steps:

1. Launch Autopsy: Open the Autopsy software on your computer.

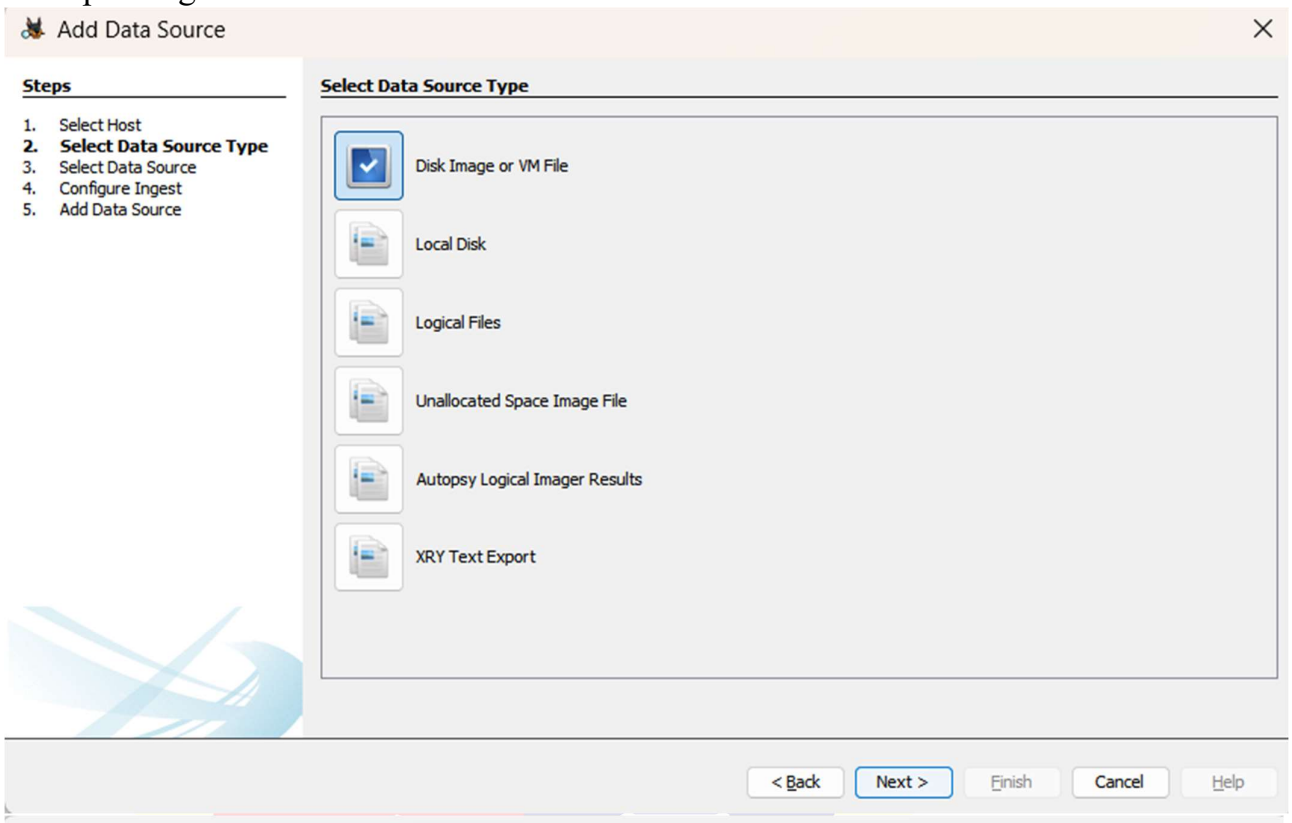


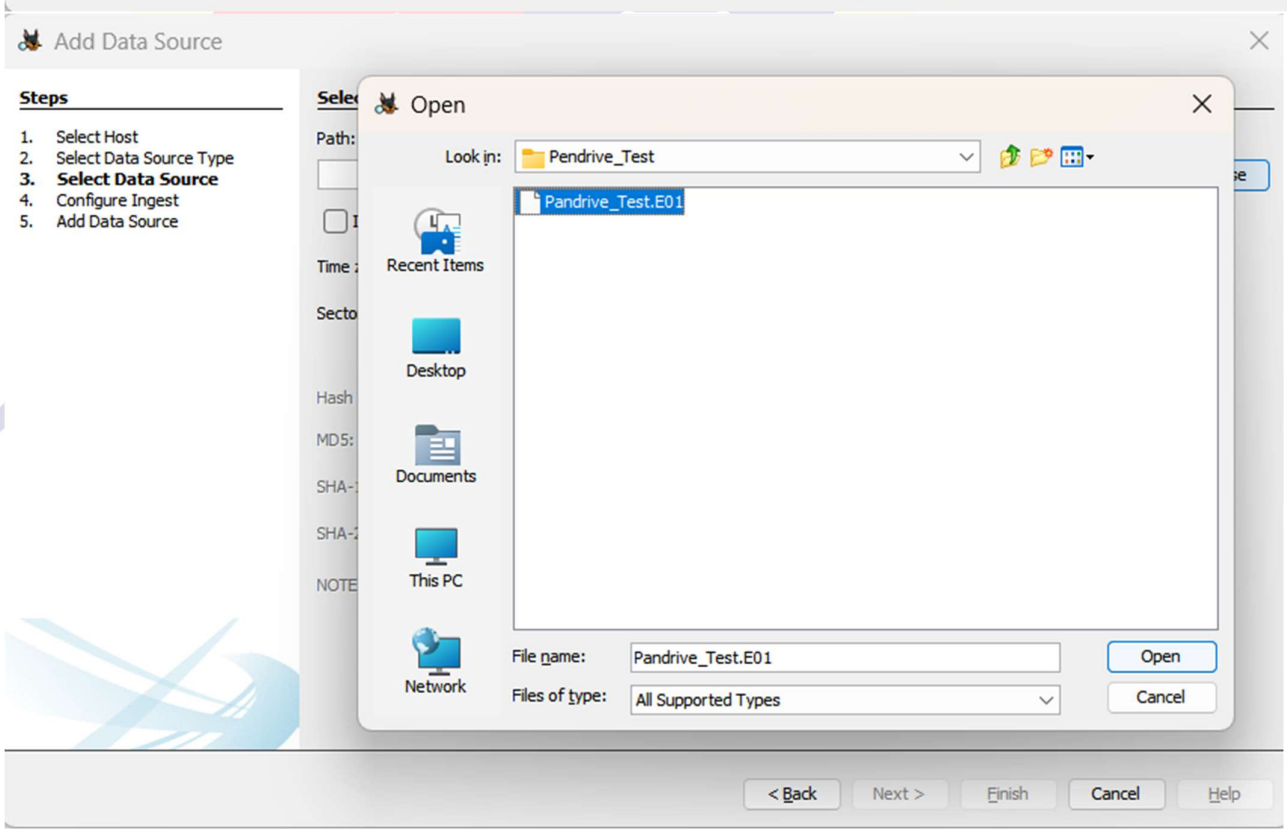
2. Create a New Case: Create a new case within Autopsy to organize your investigation.

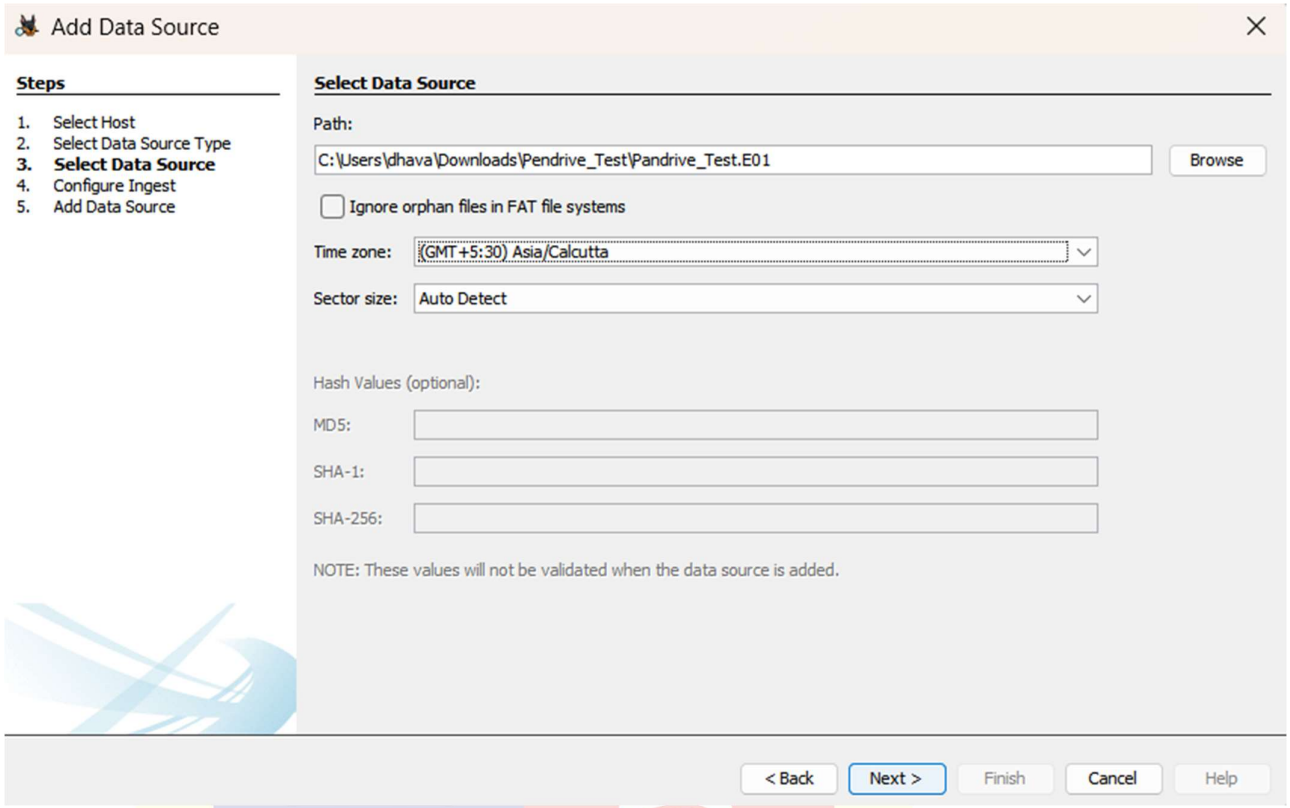




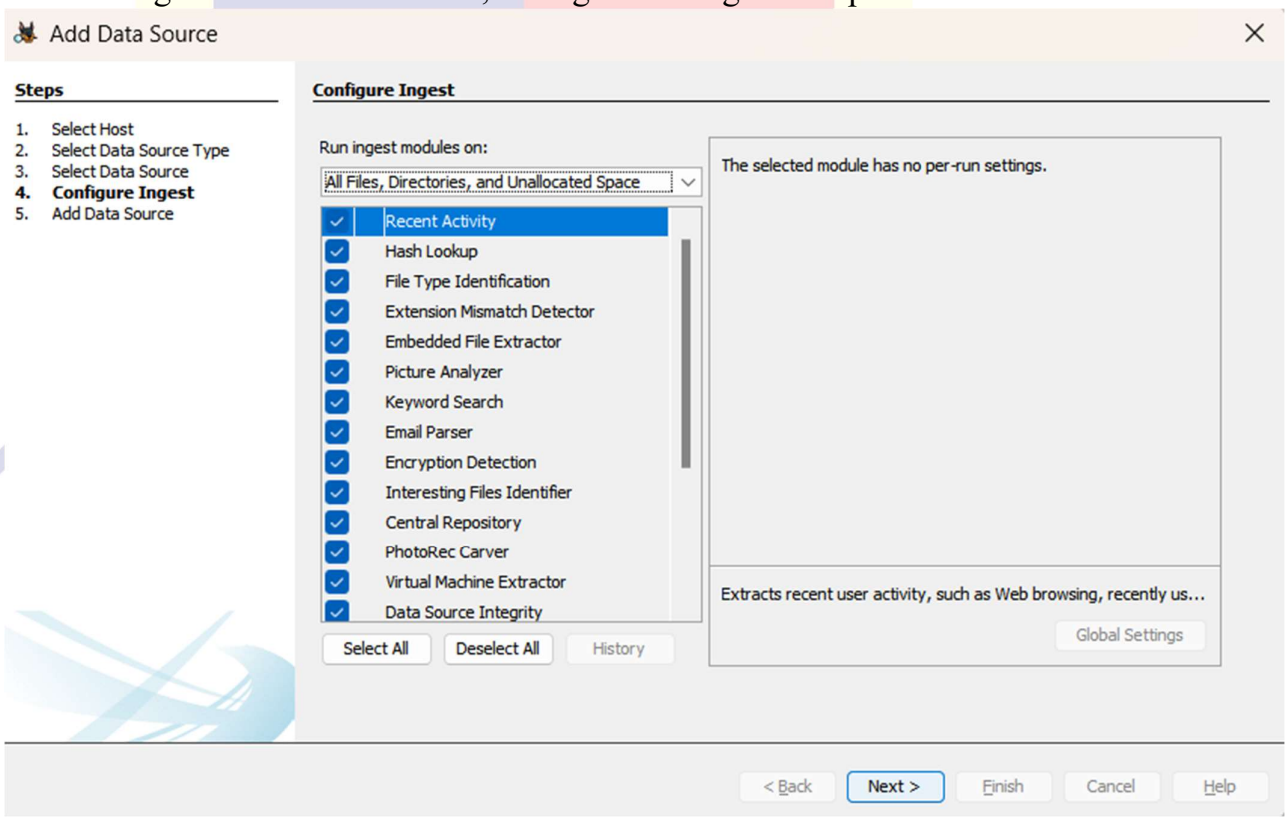
3. Add Data Source: Import the given data source, which contains the target file, into the Autopsy case. This can be done by selecting the "Add Image" or "Add Device" option, depending on the nature of the data source.

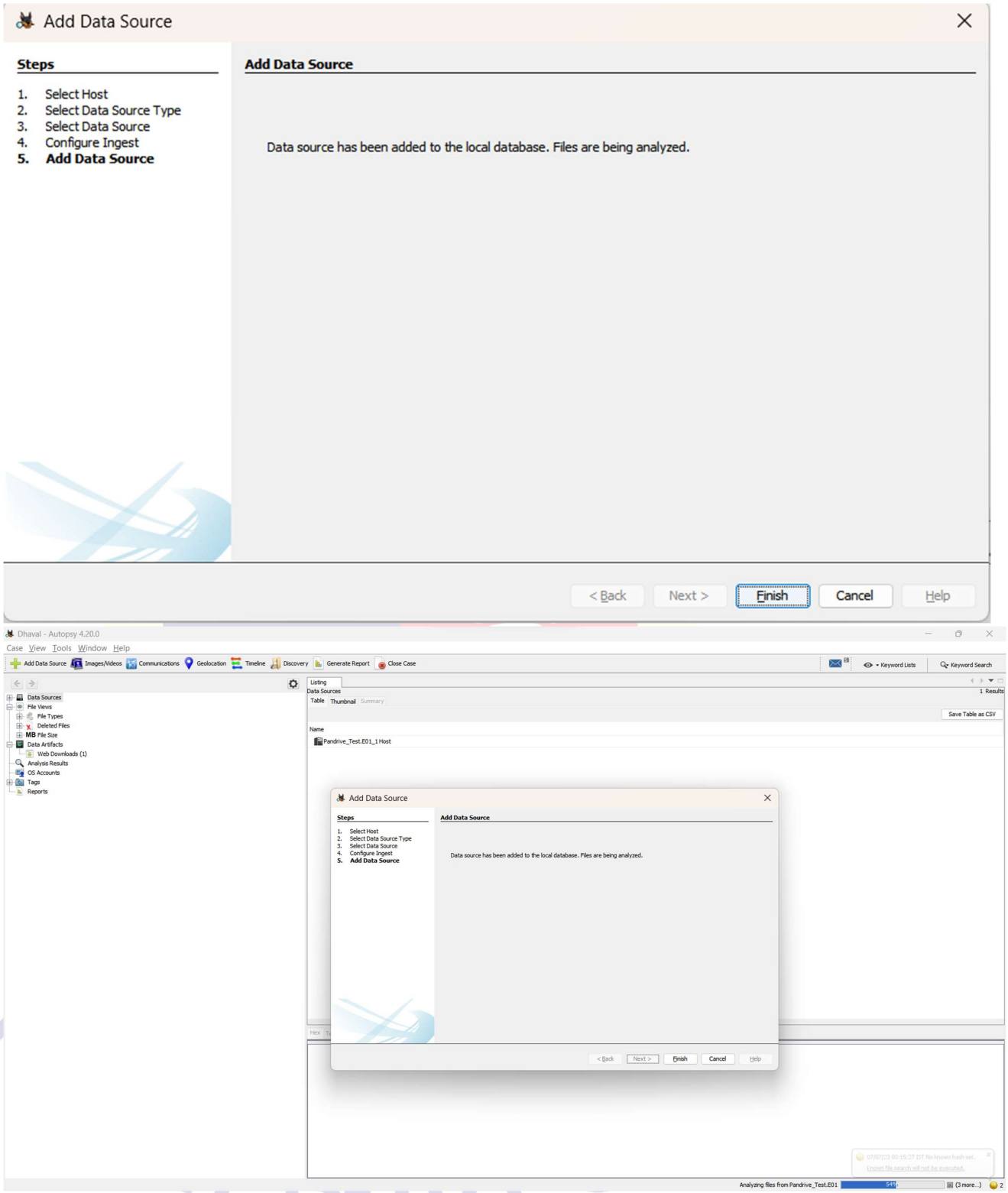




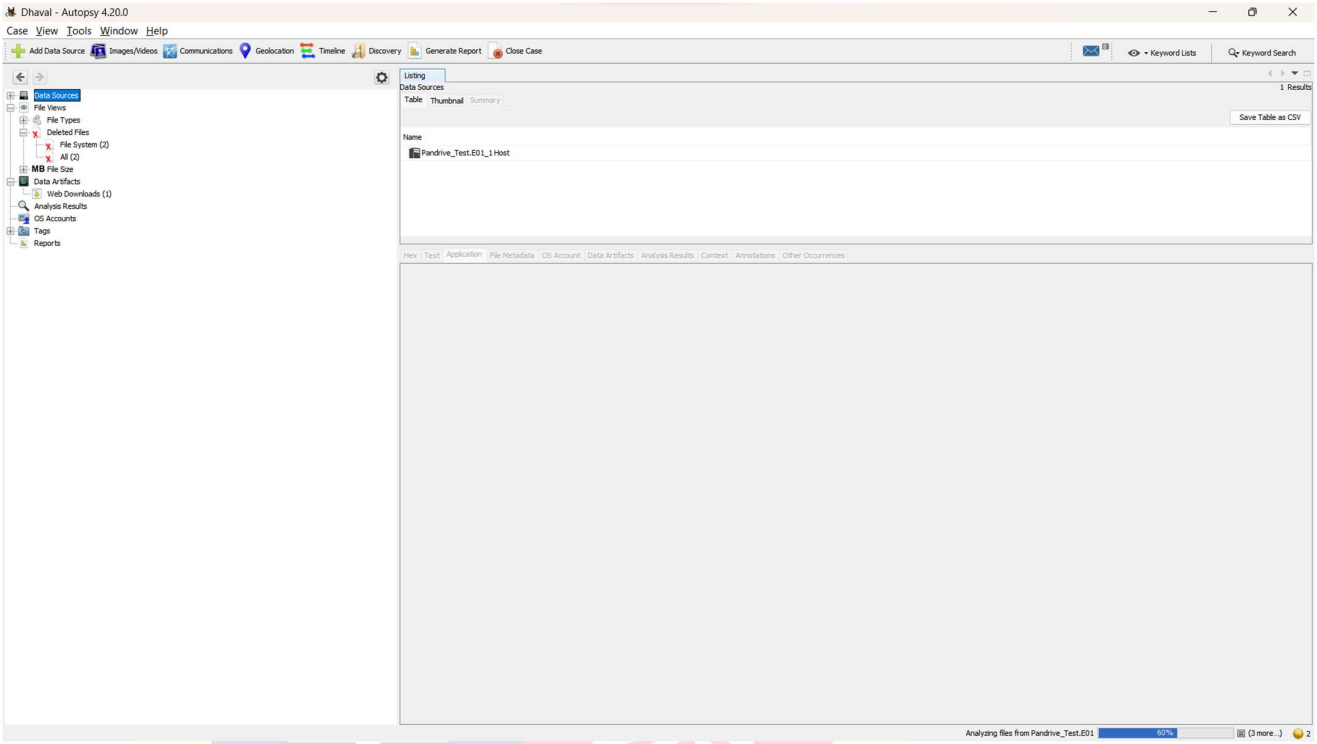


4. Configure Data Source: Provide necessary information about the data source, such as the image file or device details, during the configuration process.

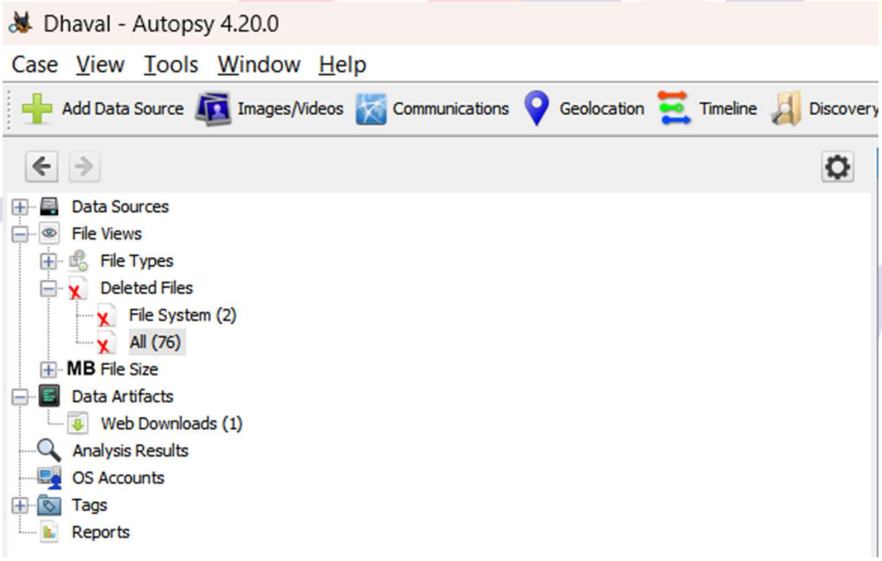


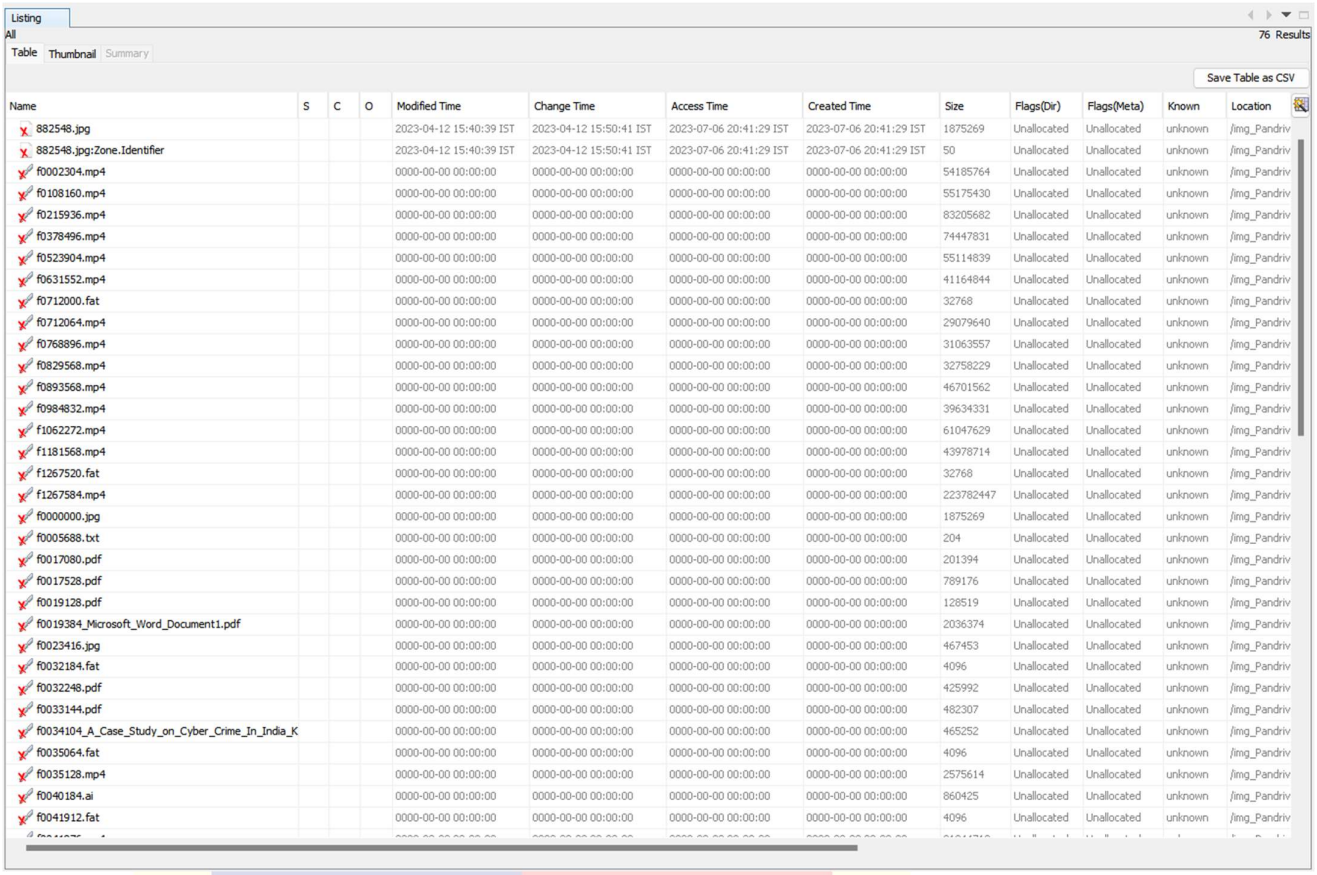


5. Start Analysis: Once the data source is added and configured, initiate the analysis process within Autopsy.

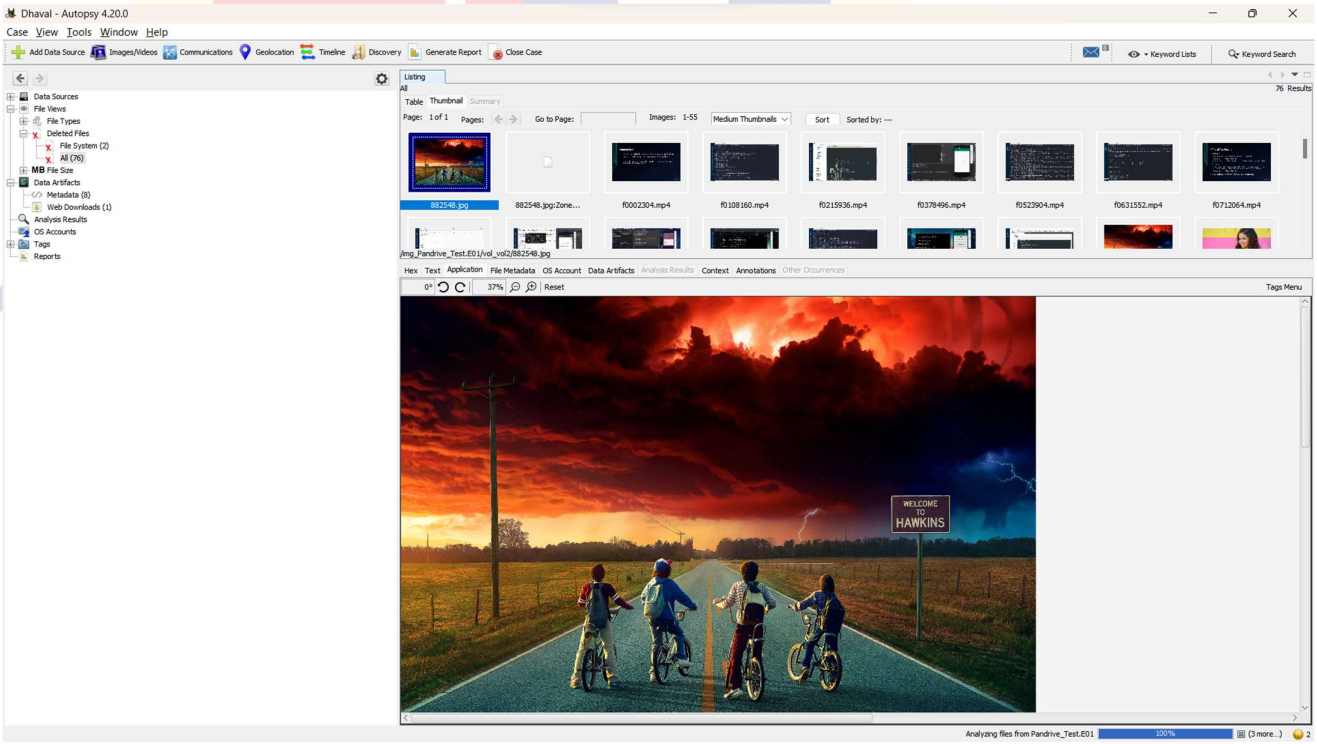


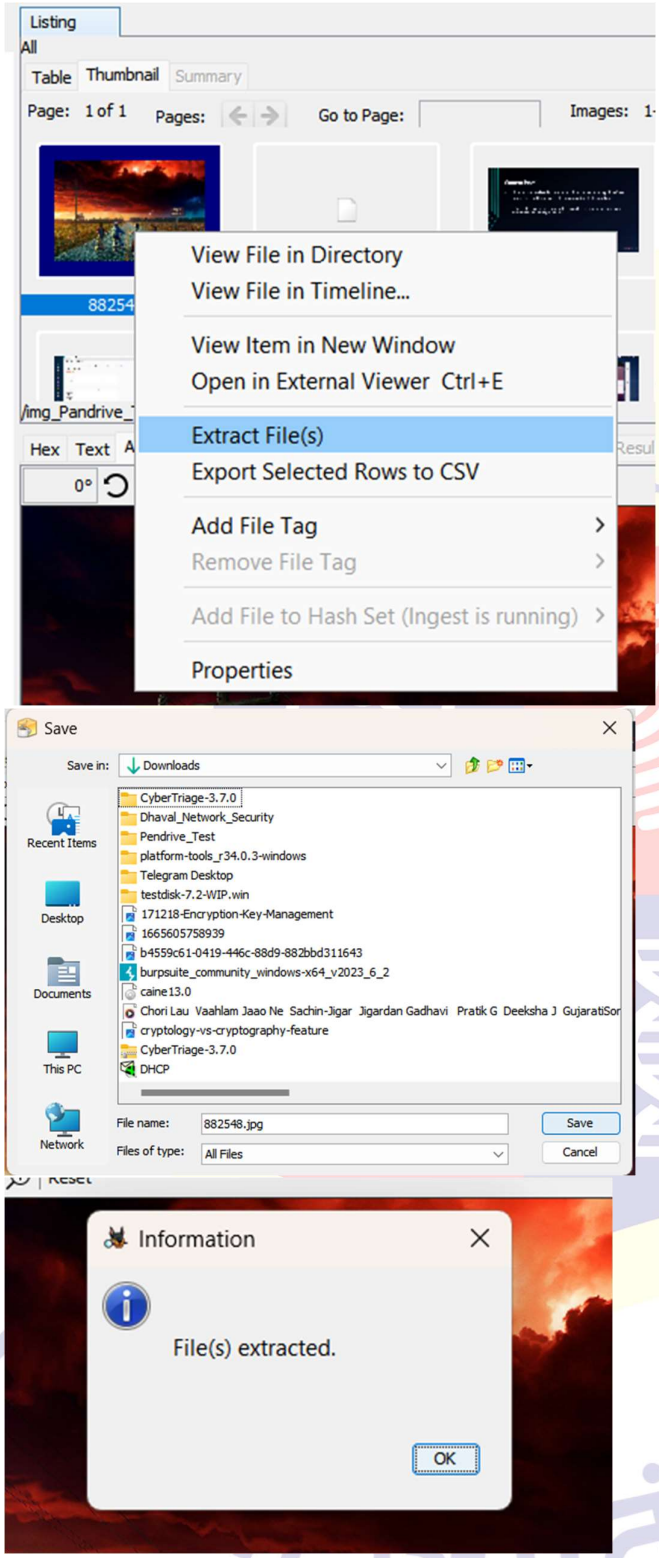
6. Search for File: Utilize Autopsy's search functionality to locate the target file within the data source. You can specify the file name or use file metadata to narrow down the search results.





7. Recover File: Once the target file is located, select the file and choose the recovery option provided by Autopsy. Follow the prompts to specify the destination for the recovered file.





8. Verify Recovery: After the recovery process is complete, verify the recovered file's integrity and accessibility to ensure a successful recovery.
9. Document Findings: Record the details of the recovery process, including the file name, location, and any additional observations or notes.

Result:

Using Autopsy, we successfully recovered the target file from the given data source. After adding and configuring the data source within the Autopsy case, we initiated the analysis and performed a search to locate the file. The file was successfully recovered, and its integrity and accessibility were verified. The details of the recovery, including the file name, location, and any relevant observations, were documented for further analysis.

Conclusion:

Autopsy proved to be an effective digital forensics tool for file recovery from the given data source. Its comprehensive search capabilities, combined with the recovery functionality, allowed us to successfully locate and recover the target file. Autopsy can be a valuable asset in forensic investigations, data recovery processes, and digital evidence analysis.

Future Scope:

1. Advanced file carving techniques: Explore Autopsy's advanced file carving capabilities to recover files even in fragmented or damaged states.
2. Timeline analysis: Utilize Autopsy's timeline feature to establish a chronological order of events related to the recovered file and other artifacts.
3. Metadata extraction and analysis: Extract and analyze file metadata using Autopsy to gain further insights into the recovered file's origin, timestamps, and associated attributes.
4. Hash analysis: Perform hash analysis on the recovered file to determine its integrity and check against known hash databases for potential matches.
5. Integration with other forensic tools: Explore integrating Autopsy with other digital forensics tools for a more comprehensive analysis and cross-validation of findings.

Experiment: 8

Title: Install cyber triage and collect the given system report.Analyse your data accordingly

Objective:

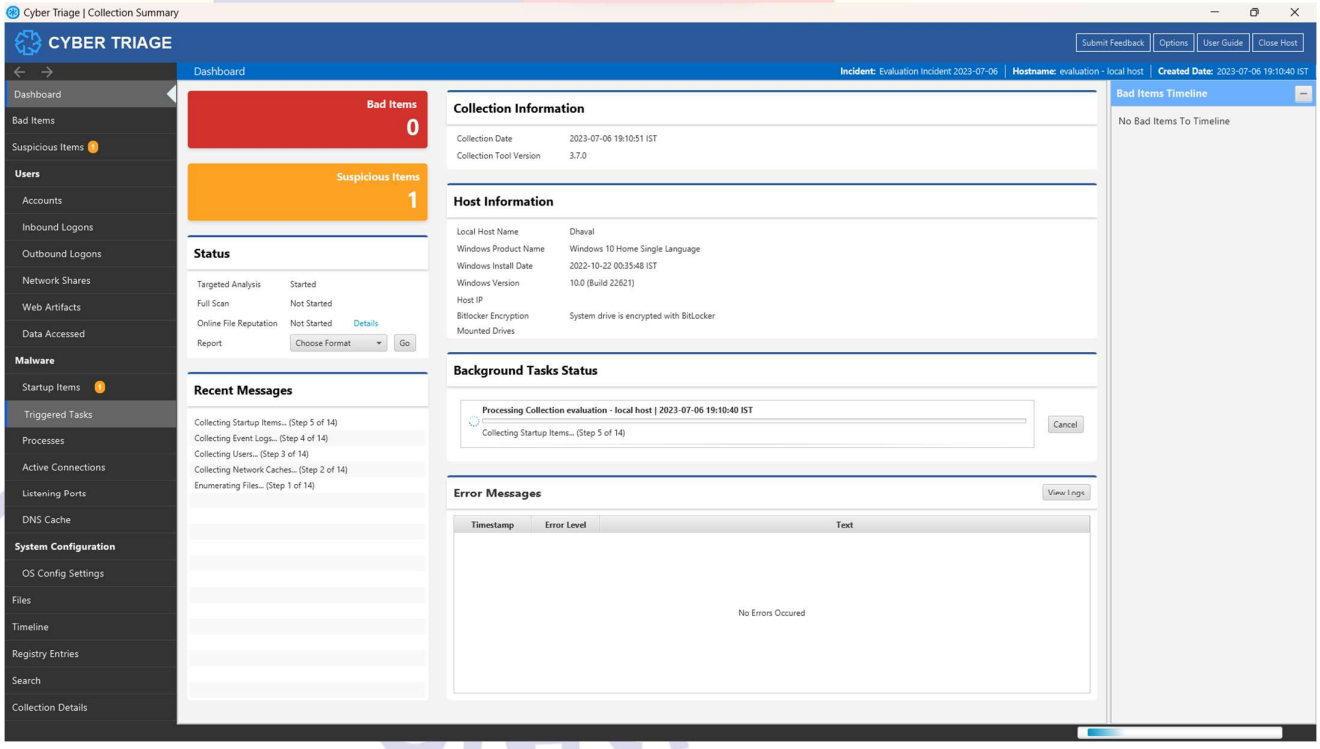
The objective of this experiment is to install Cyber Triage, a digital forensic tool, and collect a system report for analysis purposes.

Requirements:

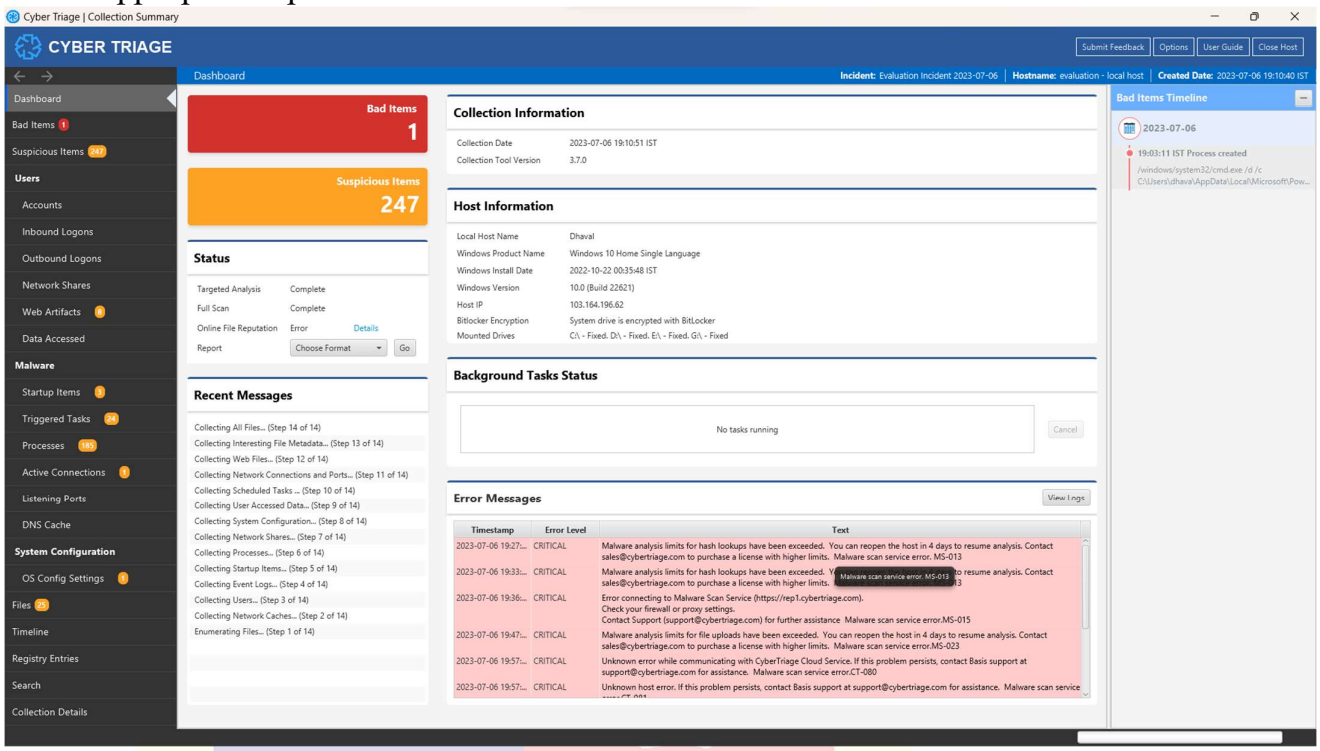
- Cyber Triage system requirements
- Internet connectivity
- Cyber Triage installation package

Procedure/Experiment Steps:

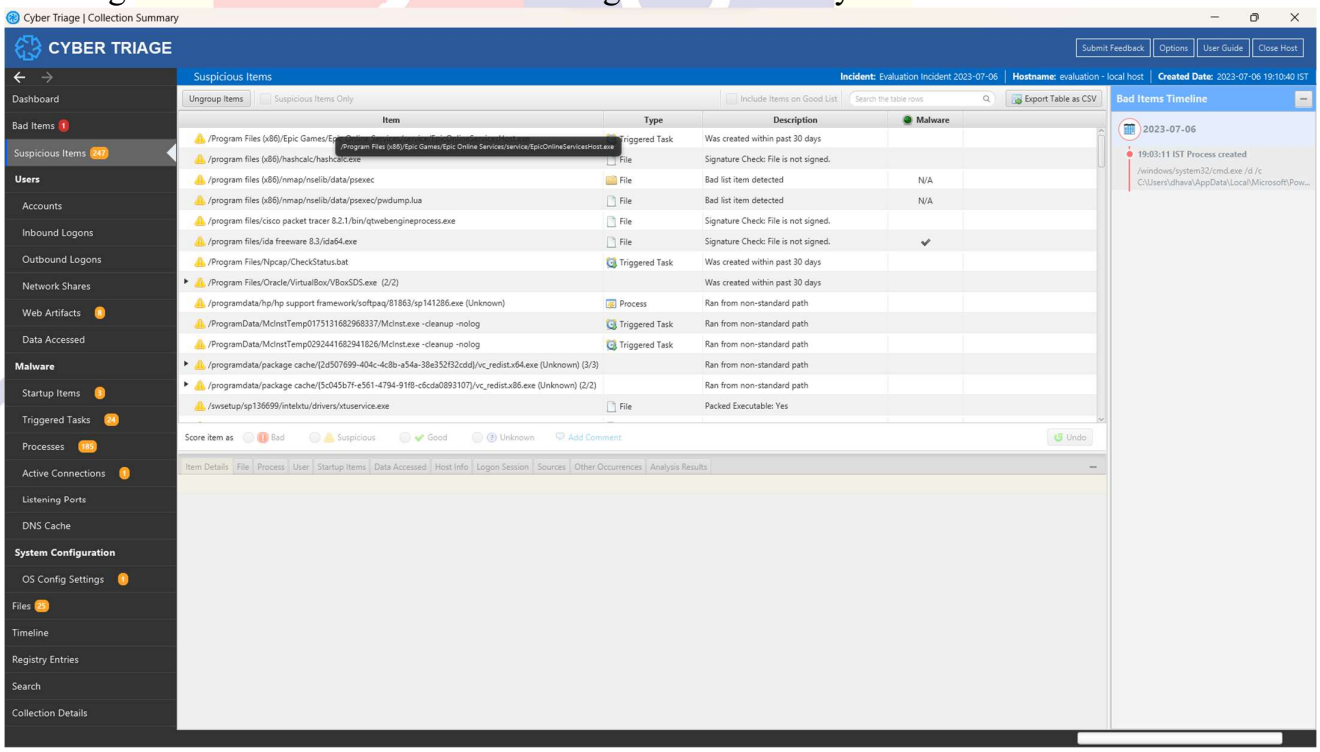
1. Download Cyber Triage: Visit the official Cyber Triage website and download the appropriate installation package for your operating system.
2. Install Cyber Triage: Follow the provided instructions to install Cyber Triage on your computer.
3. Launch Cyber Triage: After installation, launch Cyber Triage from the installed location or desktop shortcut.



4. Configure Data Collection: Set up Cyber Triage to collect the system report by selecting the appropriate options or modules within the software.

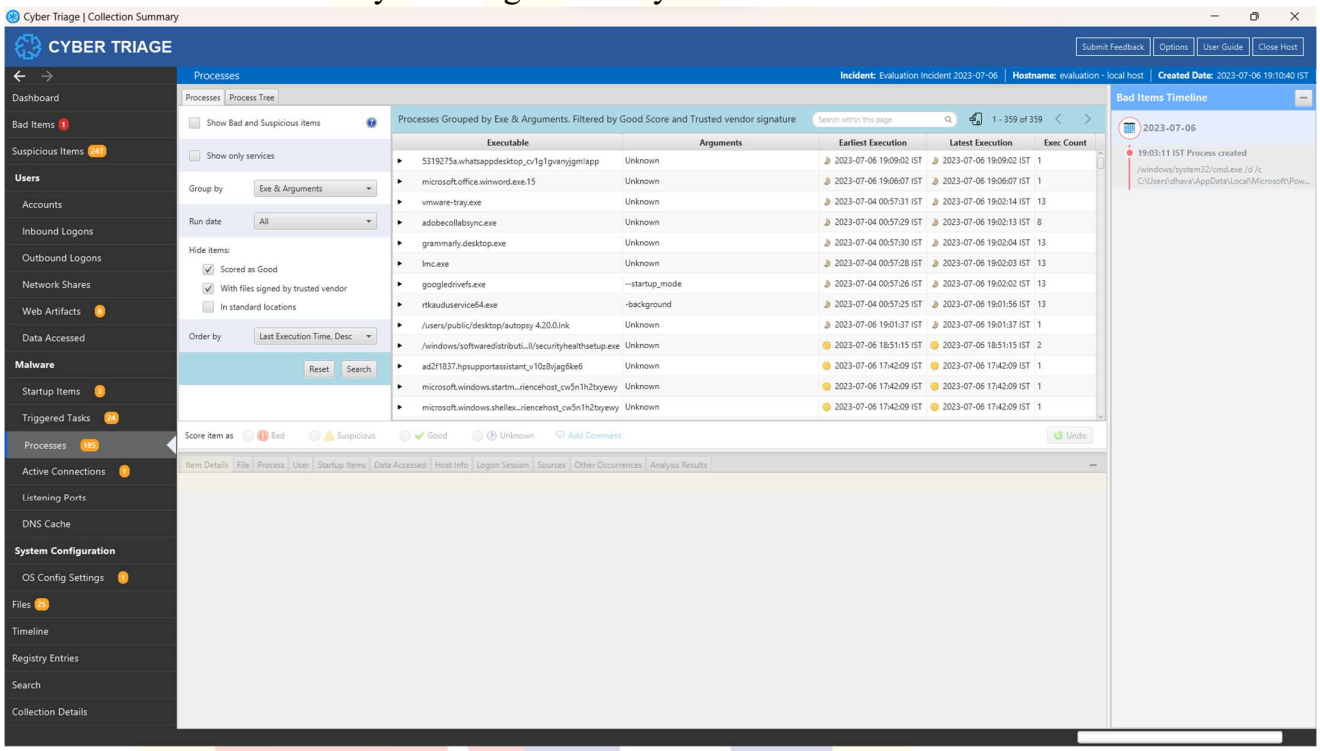


5. Initiate System Report Collection: Start the system report collection process in Cyber Triage. Allow the software to scan and gather relevant system data.



6. Wait for Data Collection to Complete: Let Cyber Triage complete the system report collection process. The duration may vary depending on the size and complexity of the system being analyzed.

7. Analyze Collected Data: Once the system report collection is finished, access the collected data within Cyber Triage for analysis.



8. Interpret System Report: Review the collected system report to extract valuable insights, identify potential security issues, and gather relevant information for further analysis.
9. Document Findings: Record the details of the analysis, including any identified issues, notable observations, or suspicious artefacts.

Result:

Using Cyber Triage, we successfully installed the software and collected a system report from the given system. After configuring the data collection settings, we initiated the collection process and allowed Cyber Triage to scan and gather the relevant system data. Once the data collection was complete, we accessed and analyzed the collected data within Cyber Triage, identifying potential security issues and extracting valuable insights. The findings and observations from the analysis were documented for further examination and action.

Conclusion:

Cyber Triage proved to be a reliable digital forensic tool for system report collection and analysis. By installing and utilizing Cyber Triage, we were able to gather comprehensive system data and gain insights into potential security issues. The software provides a valuable resource for digital forensic investigations, incident response, and proactive system monitoring.

Future Scope:

1. Deeper analysis capabilities: Utilize advanced features within Cyber Triage to conduct more in-depth analysis, such as memory forensics, timeline analysis, or file carving.
2. Integration with other forensic tools: Explore the integration of Cyber Triage with other digital forensic tools for a more comprehensive and cross-validated analysis.
3. Automation and scripting: Investigate the automation capabilities of Cyber Triage, enabling the creation of custom workflows and scripts to streamline analysis processes.
4. Threat intelligence integration: Integrate Cyber Triage with threat intelligence platforms to enhance analysis by correlating system data with known indicators of compromise.
5. Reporting and visualization: Utilize Cyber Triage's reporting and visualization features to generate comprehensive reports, graphs, and charts for easier data interpretation and communication with stakeholders.

Experiment: 9

Title: Perform digital forensics to analyse RAM timeline using CAINE tool

Objective:

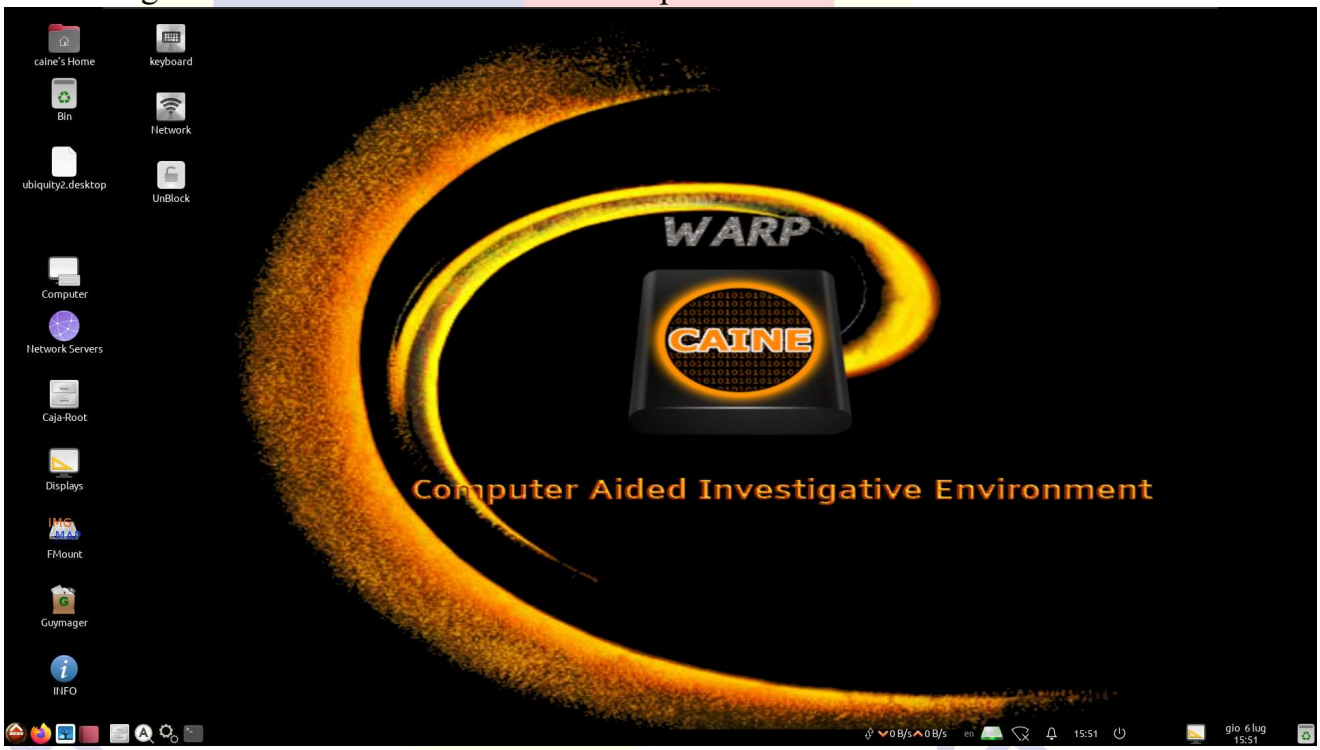
The objective of this experiment is to perform digital forensics analysis on the RAM timeline using the CAINE (Computer Aided Investigative Environment) tool.

Requirements:

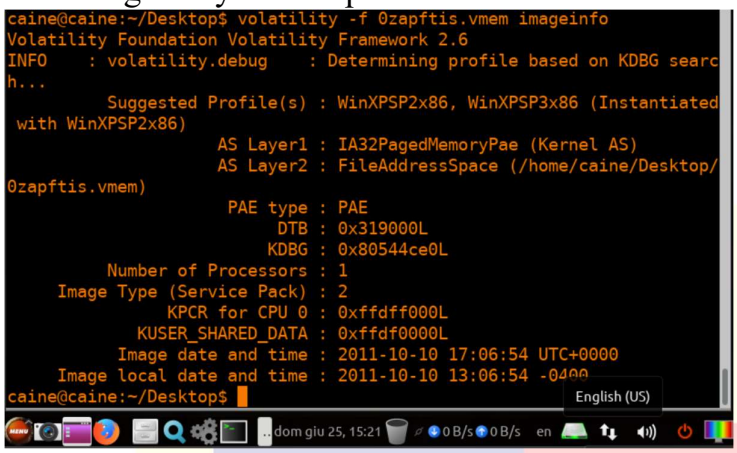
CAIN

Procedure/Experiment Steps:

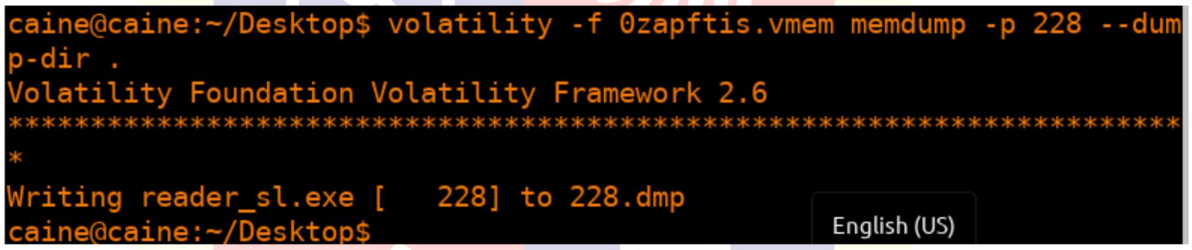
1. Prepare the Environment: Ensure that the computer meets the system requirements for running CAINE. Install CAINE on the computer.



2. Analyze RAM Timeline: Use the CAINE tool to analyze the RAM timeline. This involves examining the timeline of events and activities that occurred in the RAM during the system's operation.



3. Extract Relevant Information: Identify and extract relevant information from the RAM timeline, such as processes, network connections, file accesses, or any other artifacts of interest.



4. Interpret the Timeline: Interpret the extracted information to reconstruct the sequence of events and identify any suspicious or malicious activities that may have occurred.
5. Document Findings: Record the details of the analysis, including notable events, timestamps, processes, and any other relevant findings or observations.

Result:

Using the CAINE tool, we successfully analyzed the RAM timeline to investigate the events and activities that occurred during the system's operation. By importing the RAM image into CAINE, we were able to examine the timeline and extract relevant information. Through the analysis, we reconstructed the sequence of events and identified any suspicious or malicious activities. The findings, including notable events, timestamps, processes, and other relevant details, were documented for further investigation and action.

Conclusion:

The CAINE tool proved to be an effective resource for performing digital forensics analysis on the RAM timeline. By leveraging CAINE's capabilities, we were able to explore the timeline of events and activities stored in the RAM image. This analysis plays a crucial role in identifying potential security breaches, investigating incidents, and understanding the system's behavior during a specific timeframe.

Future Scope:

1. Advanced artifact analysis: Dive deeper into the RAM data to extract and analyze specific artifacts, such as volatile data, cryptographic keys, or memory-resident malware.
2. Memory carving techniques: Explore CAINE's memory carving capabilities to recover deleted or obscured data from the RAM image.
3. Memory forensics automation: Investigate the automation capabilities of CAINE for memory forensics analysis, allowing for the creation of custom workflows and scripts to streamline the analysis process.
4. Integration with other forensic tools: Explore the integration of CAINE with other digital forensic tools to enhance the analysis and cross-validation of findings.
5. Research and development: Stay updated with the latest research and developments in RAM analysis techniques, tools, and methodologies to continually enhance the capabilities of CAINE in this area of digital forensics.

Experiment: 10

Title: Install Wireshark to analyse captured packet. Discuss your results obtained from the tool.

Objective:

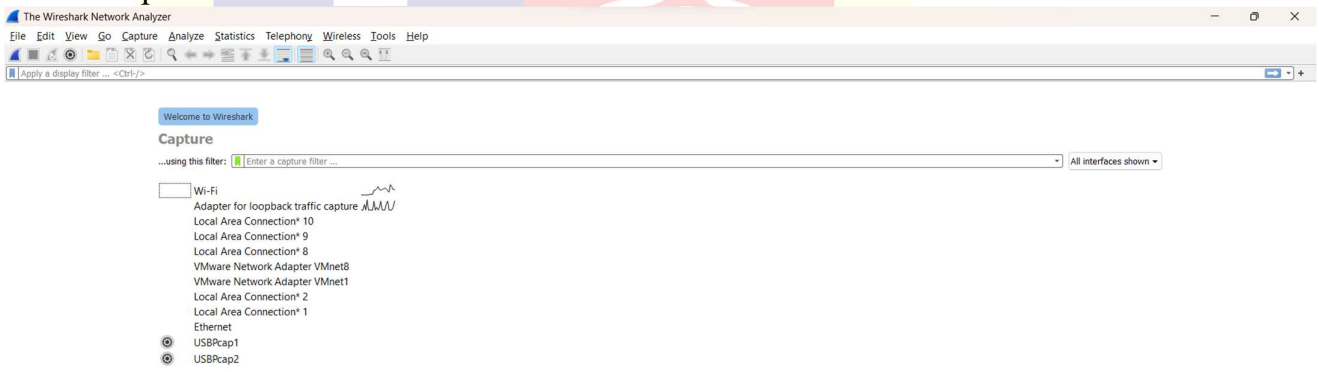
The objective of this experiment is to install Wireshark, a network protocol analyzer, and analyze captured packets using the tool.

Requirements:

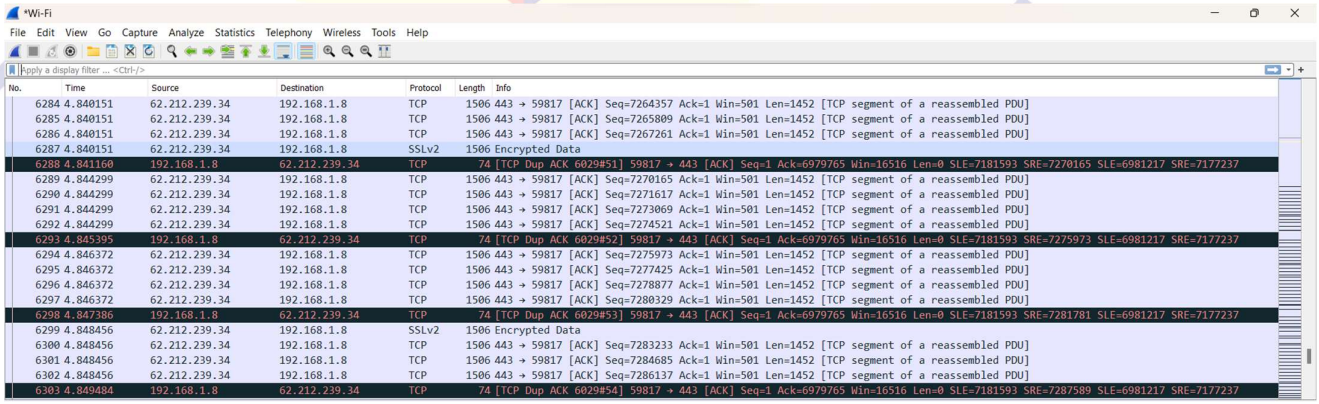
Wireshark

Procedure/Experiment Steps:

1. Download Wireshark: Visit the official Wireshark website and download the appropriate installation package for your operating system.
2. Install Wireshark: Follow the provided instructions to install Wireshark on your computer.
3. Launch Wireshark: After installation, launch Wireshark from the installed location or desktop shortcut.

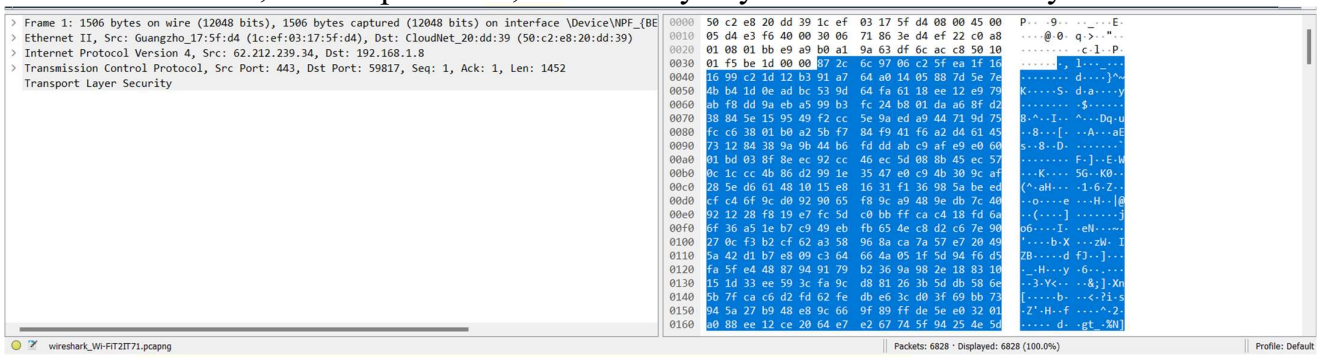


4. Capture Packets: Start capturing packets by selecting the appropriate network interface within Wireshark. Choose the desired capture filters, such as specific protocols or IP addresses, to focus on relevant traffic.

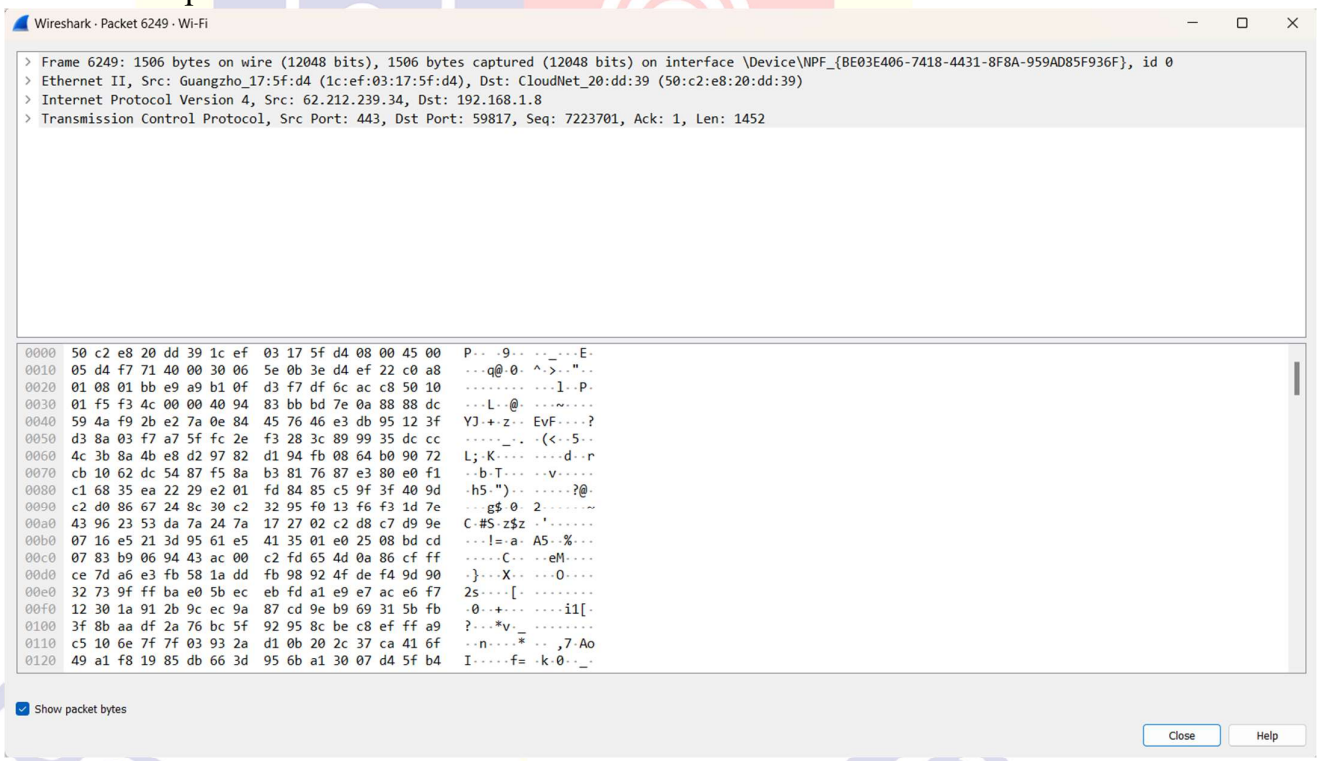


5. Monitor Packet Capture: Let Wireshark capture packets for a specific duration or until you have gathered sufficient data for analysis.

6. Stop Packet Capture: Stop the packet capture process in Wireshark once you have captured enough packets.
7. Analyze Captured Packets: Explore the captured packets within Wireshark to analyze network traffic, dissect protocols, and identify any anomalies or security issues.



8. Interpret Results: Interpret the results obtained from Wireshark analysis, paying attention to packet details, protocols used, source and destination addresses, and any observed patterns or abnormalities.



9. Document Findings: Record the details of the analysis, including notable findings, suspicious activities, or any other relevant observations.

Result:

By installing and utilizing Wireshark, we successfully captured and analyzed packets from the network traffic. After launching Wireshark, we captured packets using the specified capture filters. Once the capture was complete, we analyzed the captured packets within Wireshark, dissecting protocols, and examining packet details. The analysis yielded notable findings, including unusual network behaviors, suspicious traffic patterns, or security issues, which were documented for further investigation and action.

Conclusion:

Wireshark is a powerful network protocol analyzer that allows for the detailed analysis of captured packets. Through its intuitive interface and robust features, we were able to capture and examine network traffic, dissect protocols, and identify potential security issues. Wireshark proves to be a valuable tool for network troubleshooting, performance analysis, and security monitoring.

Future Scope:

1. Deep packet inspection: Utilize Wireshark's advanced features to perform deep packet inspection, including extracting and analyzing application-layer data, payloads, and specific protocol behaviors.
2. Network forensics analysis: Apply Wireshark's capabilities for network forensics investigations, including identifying attack patterns, malicious activities, or evidence of data breaches.
3. Statistical analysis: Leverage Wireshark's statistical tools and plugins to perform statistical analysis on captured packets, such as traffic patterns, packet sizes, or network latency.
4. Integration with other tools: Explore the integration of Wireshark with complementary tools, such as intrusion detection systems (IDS), security information and event management (SIEM) platforms, or traffic visualization tools, for enhanced network analysis and correlation of events.
5. Stay updated with Wireshark: Regularly update Wireshark to benefit from the latest features, protocol dissectors, and security enhancements, ensuring efficient and accurate packet analysis.

Experiment: 11

Title: Examine files, folders on local hard disk and network drive using FTK Imager

Objective:

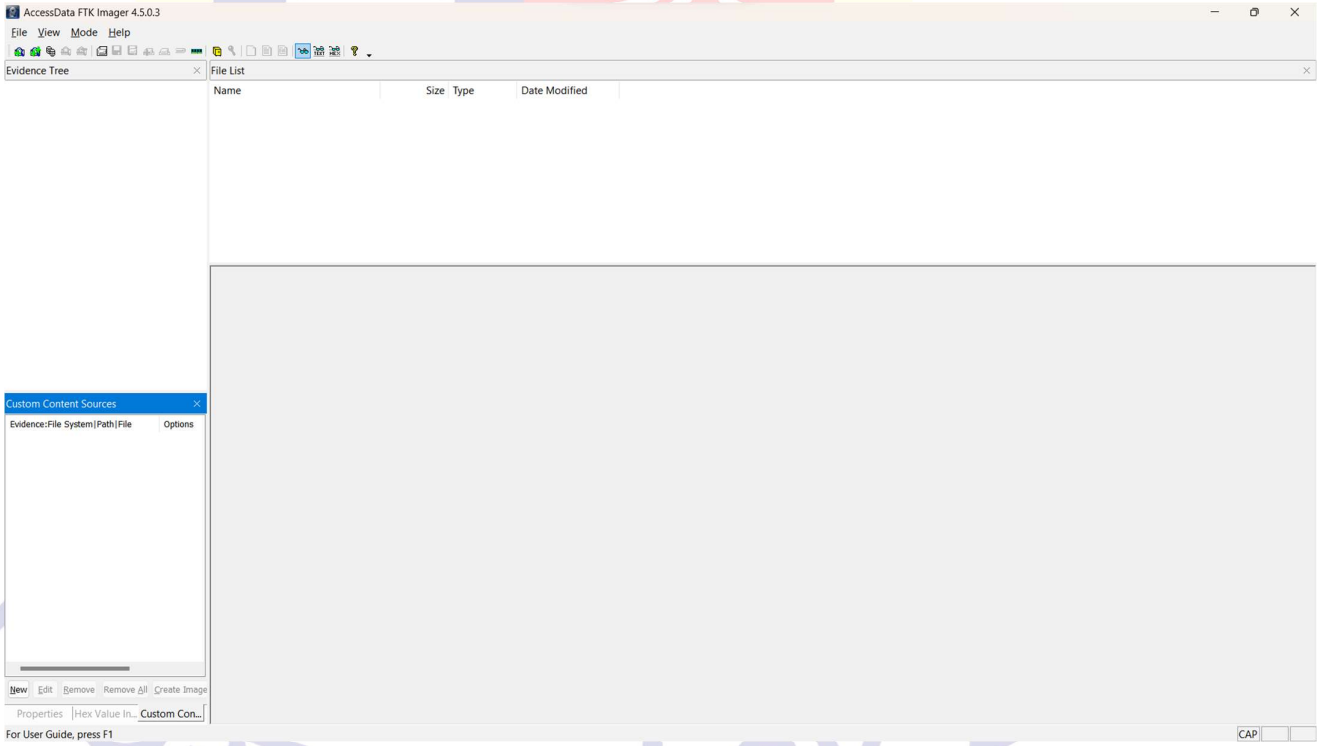
The objective of this experiment is to utilize FTK Imager, a digital forensic tool, to examine files and folders on both a local hard disk and a network drive.

Requirements:

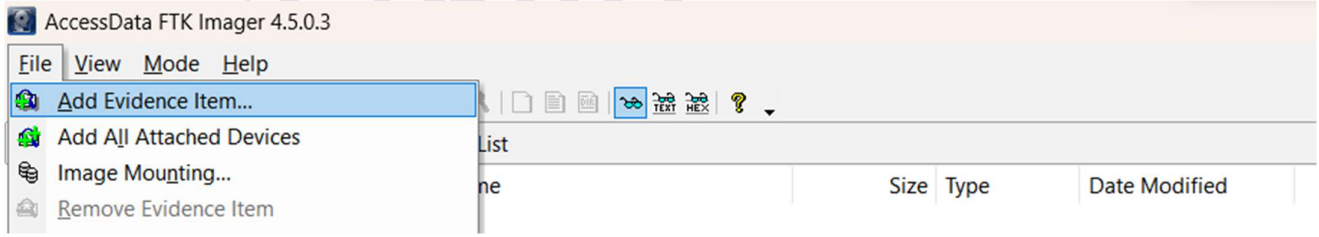
FTK Imager
Disk or drive for make image

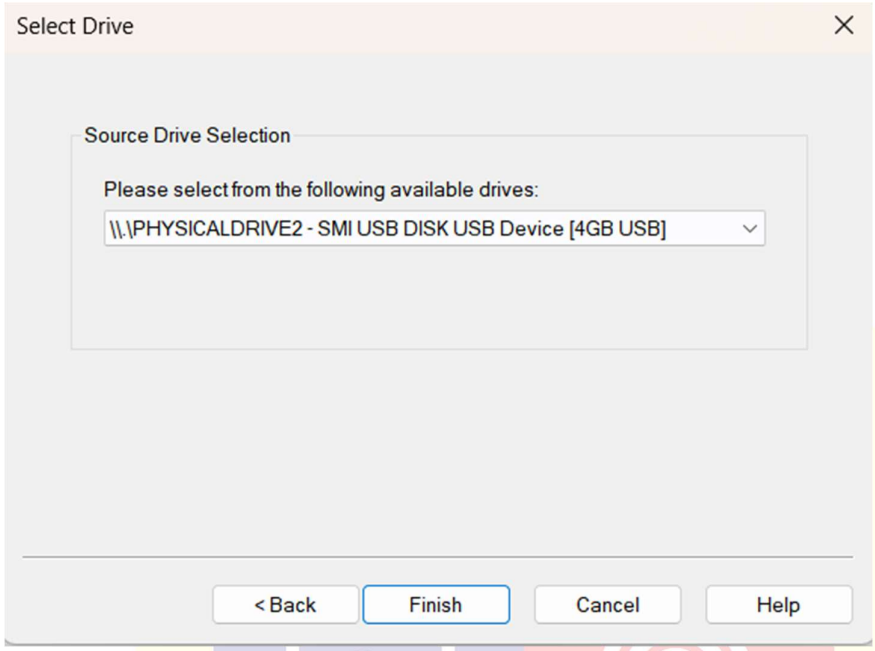
Procedure/Experiment Steps:

1. Prepare the Environment: Ensure that the computer meets the system requirements for running FTK Imager. Install FTK Imager on the computer.
2. Launch FTK Imager: Start FTK Imager from the installed location or desktop shortcut.
3. Acquire Local Hard Disk Image: Create an image of the local hard disk using FTK Imager. Follow the provided instructions within the tool to acquire the image.

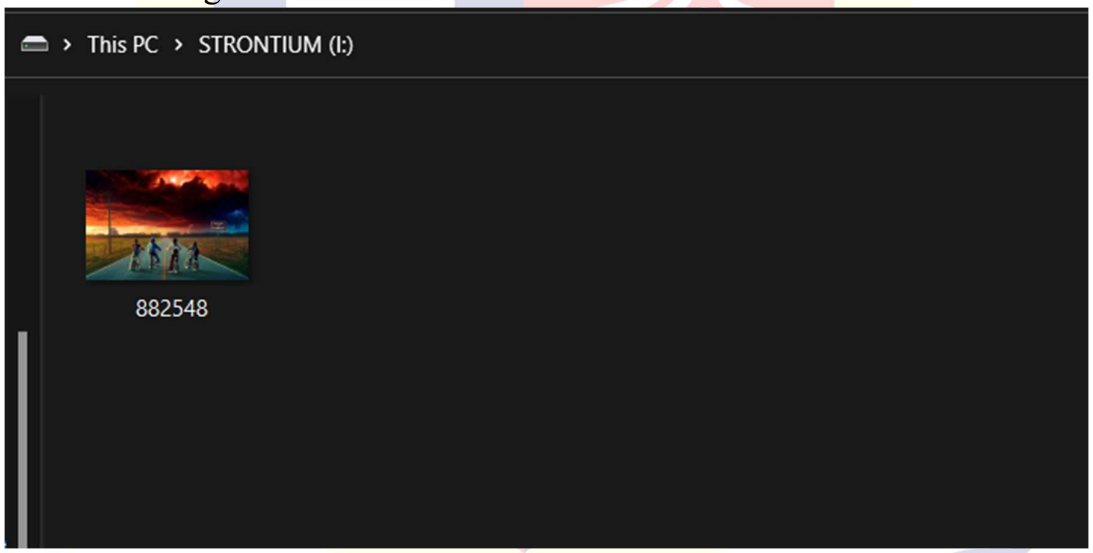


4. Add Local Hard Disk Image: Import the acquired local hard disk image into FTK Imager. This will allow examination of the file and folder structure within the image.



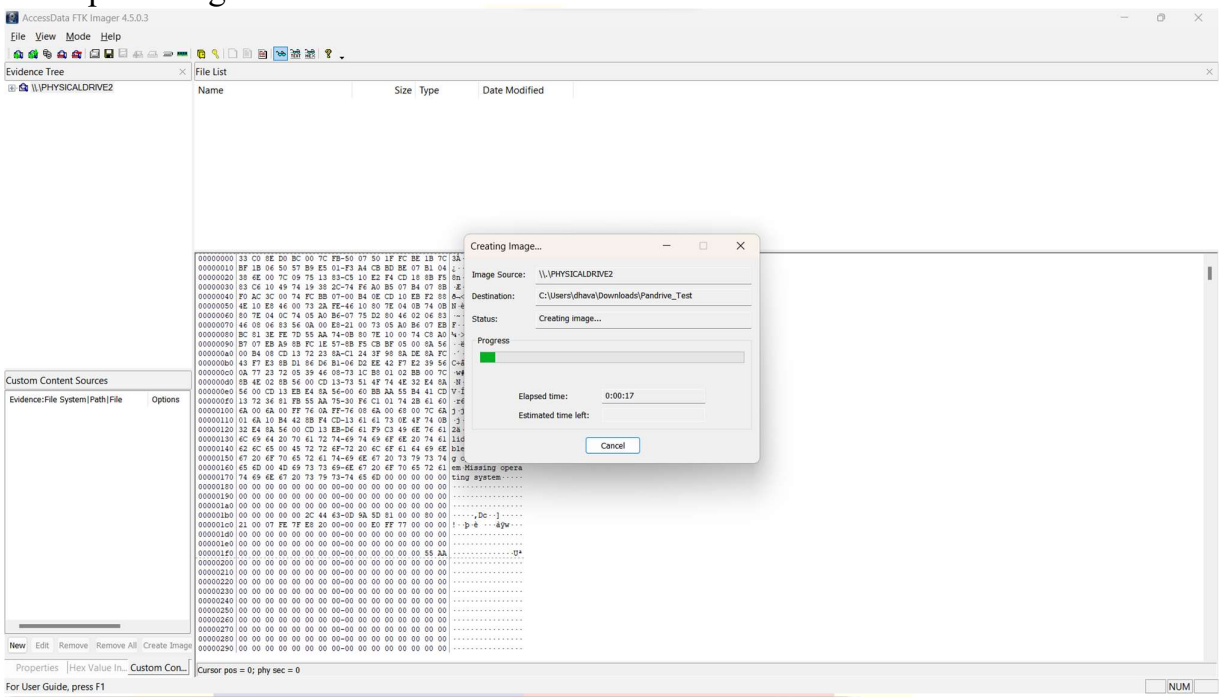


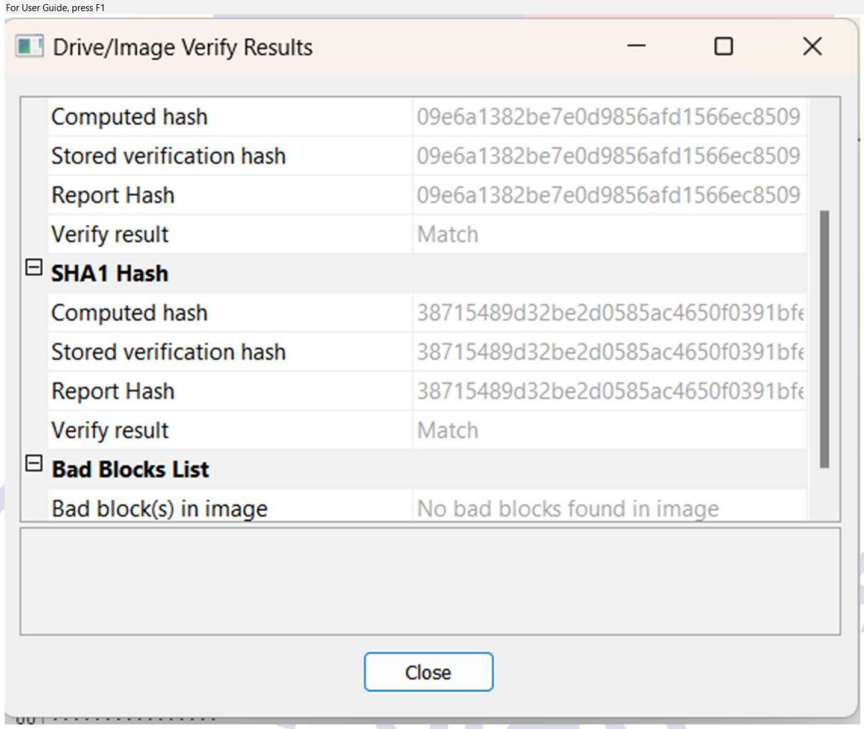
5. File or image in the drive

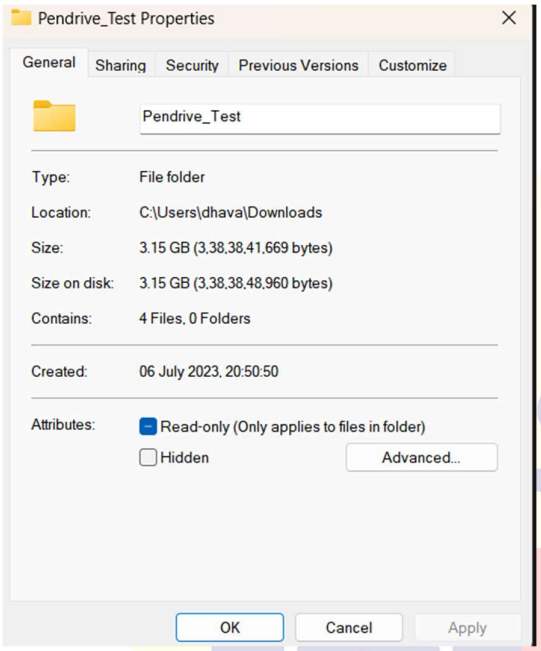


6. Explore Local Hard Disk: Use FTK Imager to navigate through the file and folder structure of the local hard disk image. Examine the files, folders, metadata, and any other relevant information.

7. Export Image file







8. Document Findings: Record the details of the examination, including notable files, folders, timestamps, or any other relevant findings or observations.

Result:

By utilizing FTK Imager, we successfully examined files and folders on both a local hard disk and a network drive. We acquired images of the local hard disk and network drive, and then imported them into FTK Imager for analysis. Using the tool, we explored the file and folder structures, examined metadata, and documented relevant findings. Notable files, folders, timestamps, and other observed details were recorded for further analysis and reporting.

Conclusion:

FTK Imager is an effective digital forensic tool for examining files and folders on local and network drives. Through its image acquisition and analysis capabilities, we were able to navigate and explore the file systems of both the local hard disk and the network drive. FTK Imager proves to be a valuable asset in digital forensic investigations, data recovery processes, and file system analysis.

Future Scope:

1. Advanced metadata analysis: Utilize FTK Imager's metadata extraction capabilities to gather and analyze extended file attributes, timestamps, file permissions, and other relevant information.
2. Carving and recovery techniques: Explore FTK Imager's file carving and recovery features to extract deleted or hidden files from acquired images.
3. Timeline analysis: Perform timeline analysis using FTK Imager to establish a chronological order of file creation, modification, or access events.
4. Integration with other forensic tools: Explore the integration of FTK Imager with other digital forensic tools to enhance analysis and cross-validation of findings.
5. Stay updated with FTK Imager: Regularly update FTK Imager to benefit from the latest features, improvements, and support for new file system formats, ensuring efficient and accurate file and folder examination.

Experiment: 12

Title: Install Tally software and create a company. Add sufficient data. After modifications, analyze the windows registry to identify evidence related to the company.

Objective:

The objective of this experiment is to install Tally software, create a company, add sufficient data, and then analyze the Windows registry to identify evidence related to the company.

Requirements:

Tally Software

Procedure/Experiment Steps:

1. Prepare the Environment: Ensure that the computer meets the system requirements for running Tally software. Install Tally software on the computer.
2. Launch Tally Software: Start Tally software from the installed location or desktop shortcut.
3. Create a Company: Follow the provided instructions within Tally software to create a new company. Provide the necessary details, such as company name, address, and financial year.
4. Add Sufficient Data: Populate the created company with sufficient data, including ledger entries, vouchers, and transactions. This will ensure a realistic representation for analysis purposes.
5. Modify Company Data: Make modifications to the company data, such as altering ledger entries, updating voucher details, or changing transaction information. Document the modifications made for future reference.
6. Analyze Windows Registry: Launch the Windows Registry Editor on the computer.
7. Navigate to Tally Entries: Within the Windows Registry Editor, navigate to the registry entries related to Tally software. These entries can typically be found under "HKEY_CURRENT_USER" or "HKEY_LOCAL_MACHINE" in the "Software" or "Programs" section.
8. Examine Registry Keys and Values: Analyze the registry keys and values associated with Tally software. Look for evidence of the created company, modified data, or any other relevant information related to Tally usage.
9. Document Findings: Record the details of the analysis, including notable registry keys, values, timestamps, or any other evidence discovered.

Result:

By installing Tally software and creating a company, we successfully populated the company with sufficient data. Modifications were made to the company data, and the Windows Registry was analyzed to identify evidence related to the company. Registry keys, values, and other relevant information were examined, and notable findings were documented for further analysis and reporting.

Conclusion:

Tally software provides an efficient accounting solution, and its usage leaves traces in the Windows Registry. By installing Tally, creating a company, and modifying company data, we were able to examine the Windows Registry to identify evidence related to the company. Analyzing the registry provides insights into Tally software usage, company data modifications, and other relevant information for forensic investigations.

Future Scope:

1. Advanced registry analysis: Dive deeper into the Windows Registry to identify additional evidence related to Tally software usage, user activities, or specific data modifications.
2. Timeline analysis: Conduct timeline analysis by correlating registry entries with other artifacts to establish a chronological sequence of events related to Tally software usage and company data modifications.
3. Registry forensics: Explore other forensic tools and techniques dedicated to Windows Registry analysis to extract and interpret more detailed information from the registry.
4. Integration with other forensic tools: Investigate the integration of Tally software and Windows Registry analysis with other digital forensic tools to enhance analysis and cross-validation of findings.
5. Stay updated with Tally software: Regularly update Tally software to benefit from the latest features, improvements, and security enhancements, ensuring efficient and accurate accounting data management and analysis.

Experiment: 13

Title: Install fedora workstation using virtual environment to demonstrate working of open source-based platform

Objective:

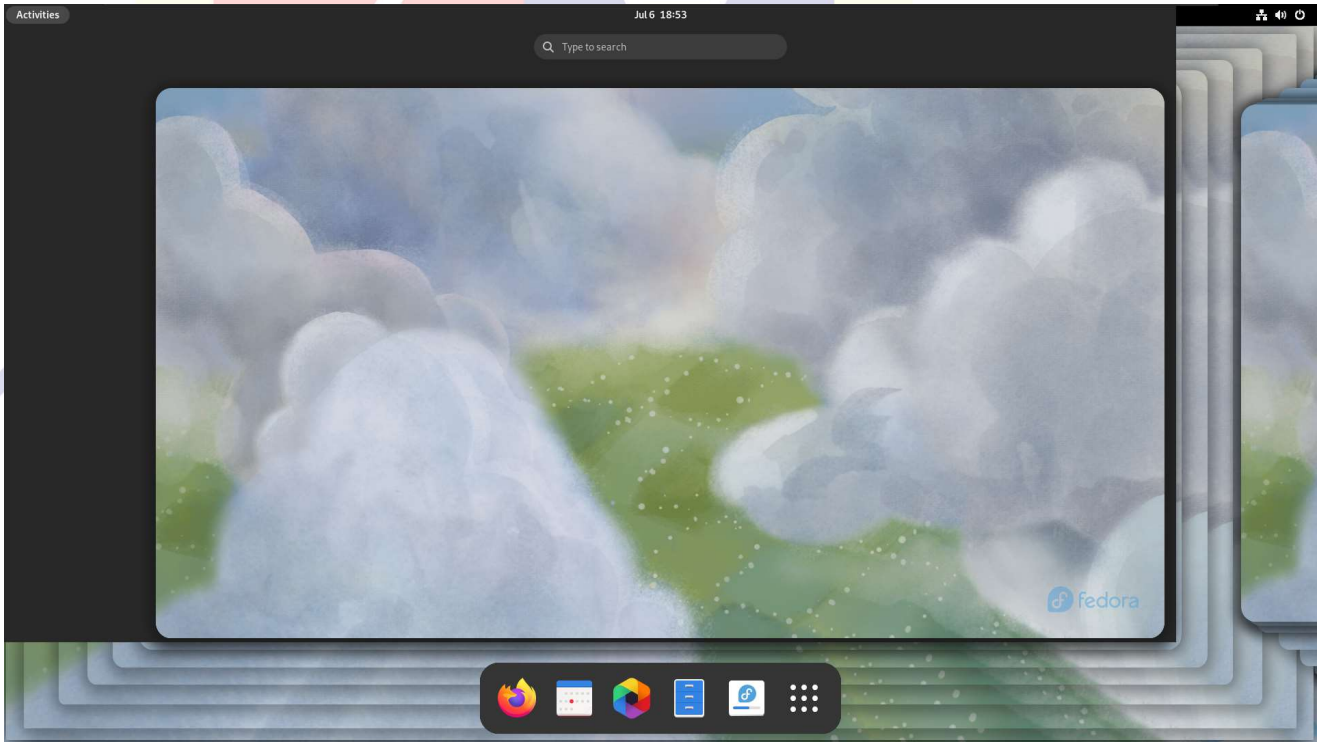
The objective of this experiment is to install Fedora Workstation, an open-source-based platform, using a virtual environment and demonstrate its functionalities and features.

Requirements:

Virtualization tool
Fedora iso

Procedure/Experiment Steps:

1. Set Up Virtual Environment: Install virtualization software (e.g., Oracle VM VirtualBox) on your computer, ensuring that it meets the system requirements.
2. Download Fedora Workstation: Obtain the Fedora Workstation ISO image from the official Fedora website (https://getfedora.org).
3. Create a Virtual Machine: Open the virtualization software and create a new virtual machine. Configure the virtual machine settings, including the name, memory size, hard disk, and network settings.
4. Install Fedora Workstation: Attach the Fedora Workstation ISO image to the virtual machine's optical drive. Start the virtual machine and follow the on-screen instructions to install Fedora Workstation.



5. Configure Fedora Workstation: Set up Fedora Workstation by providing necessary information during the installation process, such as the language, time zone, user account, and network settings.
6. Explore Fedora Workstation: Once the installation is complete, launch Fedora Workstation within the virtual machine and familiarize yourself with its interface, applications, and functionalities.

7. Document Observations: Record your observations and experiences while working with Fedora Workstation, highlighting notable features, performance, and user-friendliness.

Result:

By setting up a virtual environment and installing Fedora Workstation, we successfully demonstrated the functionalities and features of this open-source-based platform. After configuring the necessary settings during installation, we explored the GNOME desktop environment, utilized software management tools, and performed tasks such as web browsing, document editing, and file management. Throughout the demonstration, we documented our observations, noting key features, performance, and overall user experience.

Conclusion:

Fedora Workstation, as an open-source-based platform, provides a robust and user-friendly environment for productivity and various computing tasks. By installing Fedora Workstation in a virtual environment, we showcased its key features, including the GNOME desktop environment, software management, and customization options. Fedora Workstation proves to be a viable open-source choice for individuals and organizations seeking a reliable and feature-rich operating system.

Future Scope:

1. Advanced customization: Explore advanced customization options within Fedora Workstation, such as desktop theming, extensions, and application integration.
2. Software development environment: Utilize Fedora Workstation for software development purposes, leveraging its tools, libraries, and package management system.
3. Security features: Investigate the security features and tools available in Fedora Workstation, such as SELinux (Security-Enhanced Linux) and firewall configuration.
4. Integration with enterprise solutions: Explore the integration of Fedora Workstation with enterprise solutions and services, such as cloud platforms or centralized user management systems.
5. Stay updated with Fedora: Regularly update Fedora Workstation to benefit from the latest software updates, security patches, and new features, ensuring a stable and secure computing environment.

Experiment: 14

Title: Use USB drive as data source and Belkasoft X to demonstrate data / file carving

Objective:

The objective of this experiment is to utilize Belkasoft X, a digital forensics tool, to demonstrate data/file carving from a USB drive.

Requirements:

Belkasoft installer

Procedure/Experiment Steps:

1. Prepare the Environment: Ensure that the computer meets the system requirements for running Belkasoft X. Install Belkasoft X on the computer.
2. Connect USB Drive: Connect the USB drive containing the data for carving to the computer.
3. Launch Belkasoft X: Start Belkasoft X from the installed location or desktop shortcut.
4. Add USB Drive as Evidence Source: Within Belkasoft X, add the connected USB drive as an evidence source. Follow the provided instructions in the software to add and mount the USB drive.
5. Start Carving Process: Initiate the carving process within Belkasoft X to search for and recover deleted or hidden files from the USB drive. Configure the carving settings according to your requirements.
6. Monitor Carving Progress: Let Belkasoft X perform the carving process on the USB drive. Monitor the progress of the carving operation within the software.
7. Examine Carved Files: Once the carving process is complete, explore the carved files within Belkasoft X. Review the recovered files and metadata, such as file types, timestamps, and file paths.
8. Recover Selected Files: Select the desired carved files within Belkasoft X and recover them to a designated location on the computer's storage.
9. Document Findings: Record the details of the carving process, including notable findings, recovered files, timestamps, or any other relevant observations.

Result:

By using Belkasoft X, we successfully demonstrated data/file carving from a USB drive. The USB drive containing the data was added as an evidence source within Belkasoft X. The carving process was initiated, and deleted or hidden files were recovered from the USB drive. The carved files were examined within Belkasoft X, and selected files were successfully recovered to a designated location for further analysis.

Conclusion:

Belkasoft X proved to be an effective digital forensic tool for data/file carving from a USB drive. Through its intuitive interface and carving capabilities, we were able to search for and extract recoverable files from the USB drive. Carving can be a valuable technique in forensic investigations, data recovery processes, and extracting valuable artifacts from various data sources.

Future Scope:

1. Advanced carving techniques: Explore Belkasoft X's advanced carving features, such as custom file signatures, data pattern analysis, or deep carving for fragmented files.
2. File system-specific carving: Investigate Belkasoft X's support for specific file systems (e.g., FAT, NTFS, HFS+) and perform carving based on file system-specific structures.
3. Carving from other data sources: Extend carving capabilities to other data sources, such as disk images, memory dumps, or network captures, using Belkasoft X.
4. Integration with other forensic tools: Explore the integration of Belkasoft X with other digital forensic tools to enhance analysis and cross-validation of carved files.
5. Stay updated with Belkasoft X: Regularly update Belkasoft X to benefit from the latest features, improvements, and support for new file formats or carving techniques, ensuring efficient and accurate file carving.

Experiment: 15

Title: Use PhotoRec to recover lost files, audio or video content from the HDD/USB Drive using file carving

Objective:

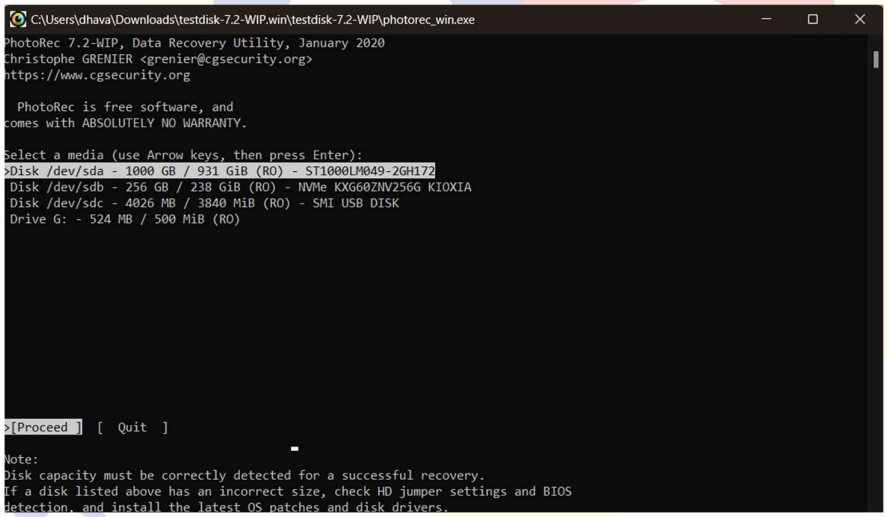
The objective of this experiment is to utilize PhotoRec, a file recovery tool, to recover lost files, including audio and video content, from an HDD or USB drive using file carving techniques.

Requirements:

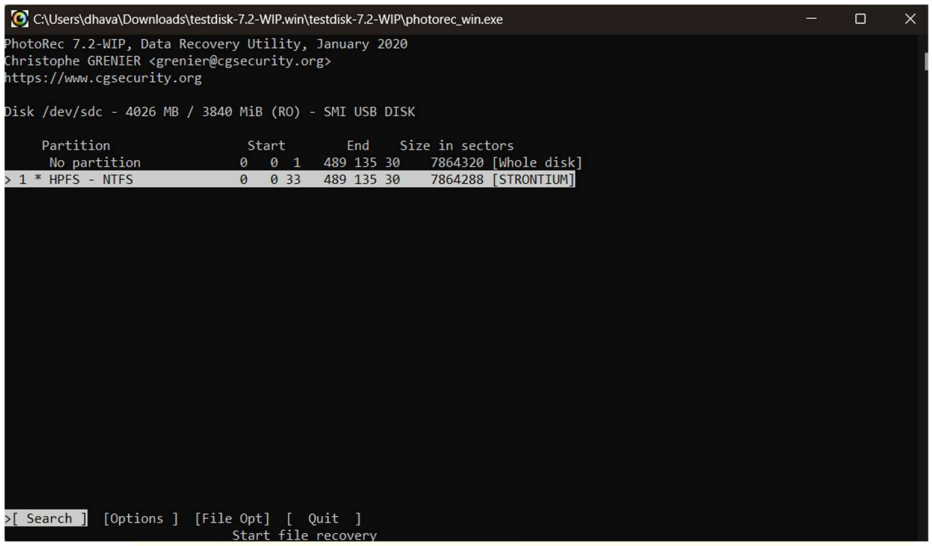
PhotoRec
Disk or drive contain lost file for recovery

Procedure/Experiment Steps:

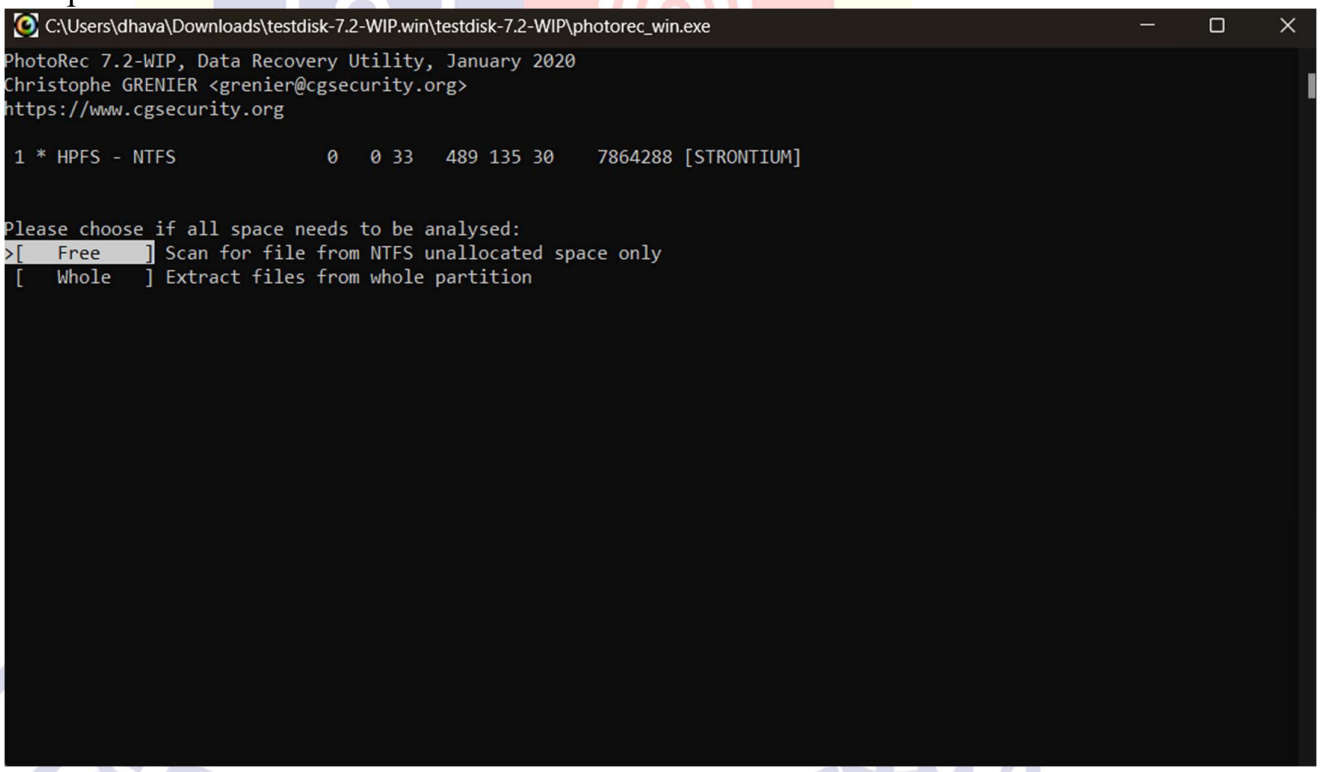
1. Prepare the Environment: Ensure that the computer meets the system requirements for running PhotoRec. Install PhotoRec on the computer.
2. Connect HDD/USB Drive: Connect the HDD or USB drive containing the lost files to be recovered to the computer.
3. Launch PhotoRec: Start PhotoRec from the installed location or command-line interface.



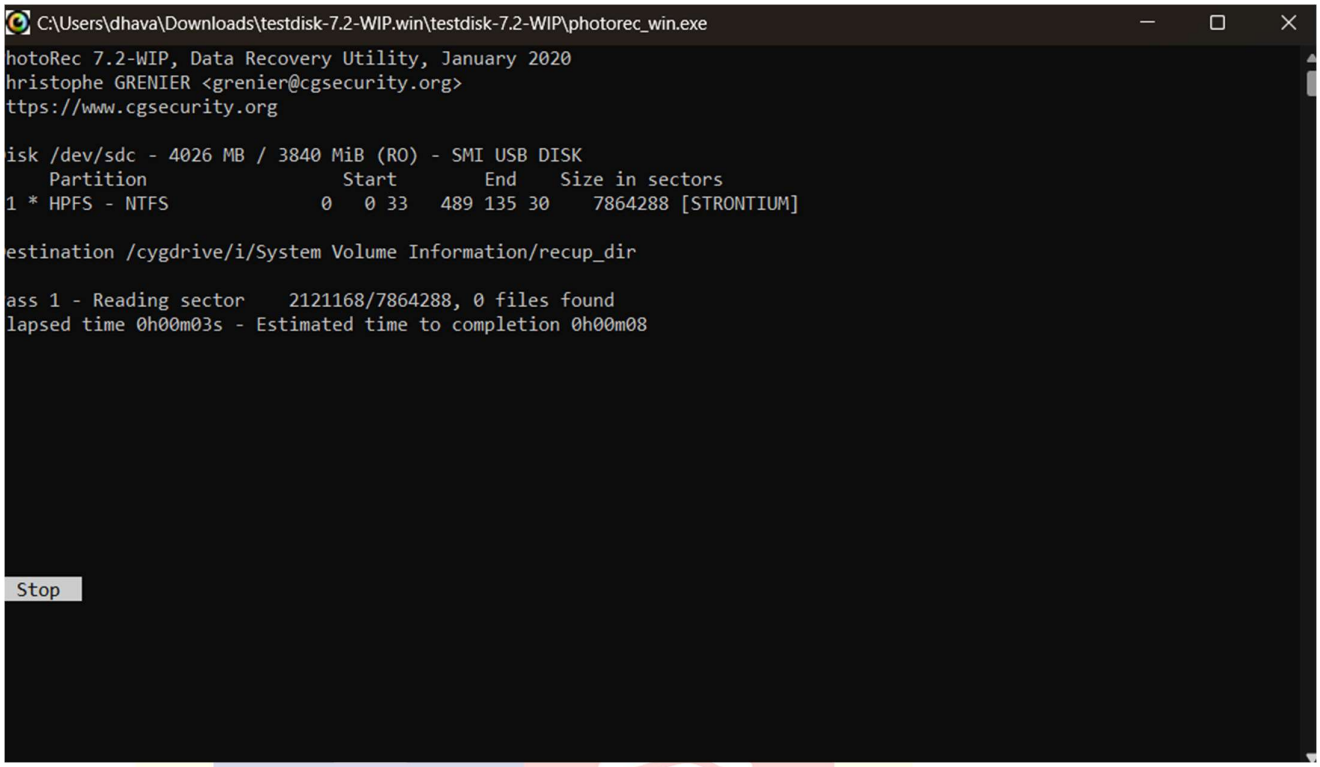
4. Select Target Drive: Choose the target drive (HDD or USB drive) from which the lost files need to be recovered using PhotoRec.



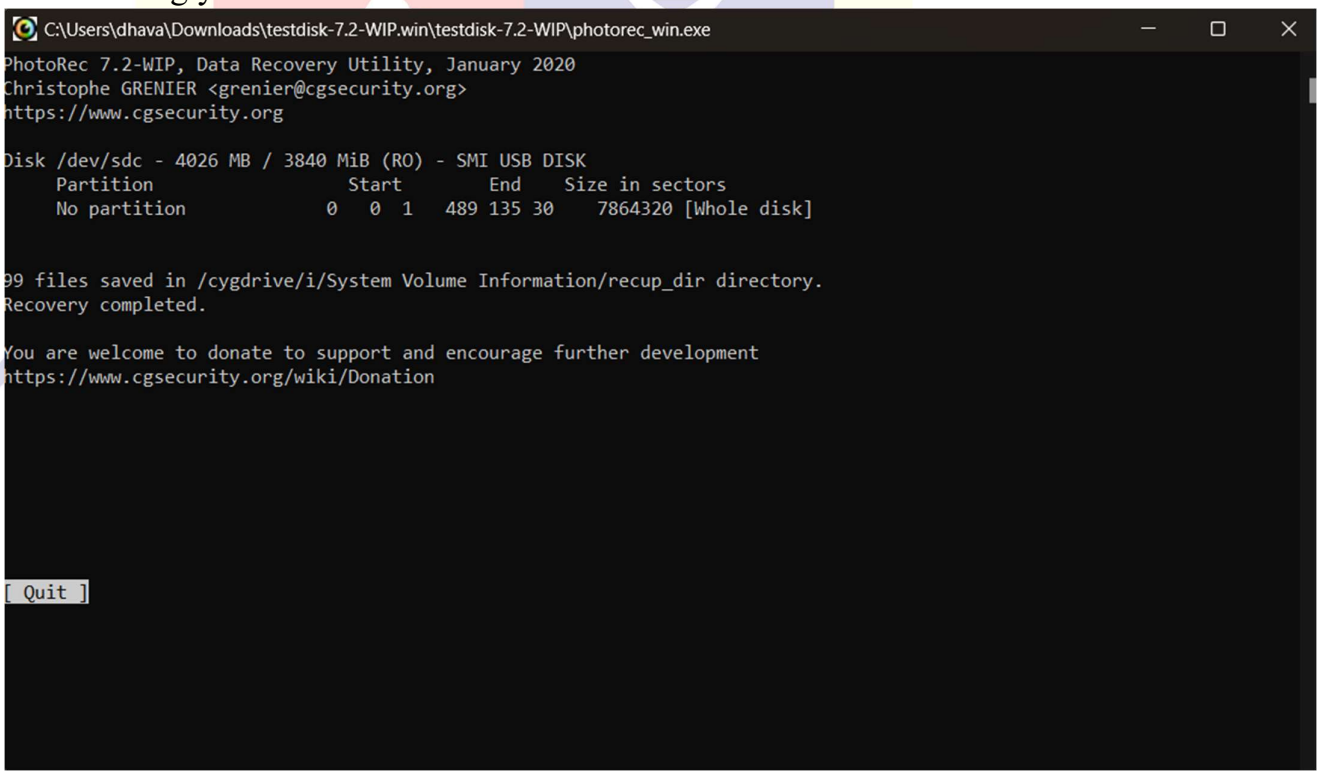
5. Configure File Carving Settings: Configure the file carving settings within PhotoRec, such as the file types to recover (e.g., audio, video), block size, and other advanced options as needed.



6. Start Recovery Process: Initiate the file recovery process in PhotoRec to scan the target drive for lost files and employ file carving techniques to recover them.



7. Monitor Recovery Progress: Monitor the recovery progress within PhotoRec, allowing the tool to scan and analyze the target drive for recoverable files.
8. Review Recovered Files: Once the recovery process is complete, review the recovered files within PhotoRec. Verify the integrity of the recovered files and organize them accordingly.



9. Document Findings: Record the details of the recovery process, including notable recovered files, their original locations (if available), and any other relevant observations.

Result:

Using PhotoRec, we successfully recovered lost files, including audio and video content, from the HDD/USB drive. By selecting the target drive and configuring the file carving settings, we initiated the recovery process in PhotoRec. Upon completion, we reviewed the recovered files, verified their integrity, and organized them for further analysis. Notable findings, including recovered files and relevant observations, were documented for future reference.

Conclusion:

PhotoRec proved to be an effective file recovery tool for retrieving lost files, including audio and video content, from an HDD or USB drive using file carving techniques. Through its usage, we were able to scan and recover files that were no longer accessible through conventional means. File carving plays a crucial role in forensic investigations, data recovery processes, and restoring important data from various storage devices.

Future Scope:

1. Advanced file carving techniques: Explore PhotoRec's advanced options and techniques for specific file types, fragmented files, or customized file signatures.
2. Disk imaging integration: Integrate PhotoRec with disk imaging tools to recover files from disk images, improving the efficiency and flexibility of file recovery processes.
3. Automated recovery workflows: Investigate the automation capabilities of PhotoRec, enabling the creation of custom recovery workflows and scripts to streamline the recovery process.
4. Integration with other forensic tools: Explore the integration of PhotoRec with other digital forensic tools to enhance analysis, cross-validation of findings, and a more comprehensive recovery process.
5. Stay updated with PhotoRec: Regularly update PhotoRec to benefit from the latest features, improvements, and support for new file formats or carving techniques, ensuring efficient and accurate file recovery.