Shaheed Zulfikar Ali Bhutto Institute of Science and Technology (SZABIST) Karachi

Digital Forensic

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Assignment: USB Write Protection, Disk Imaging, and Forensic Analysis Using Autopsy

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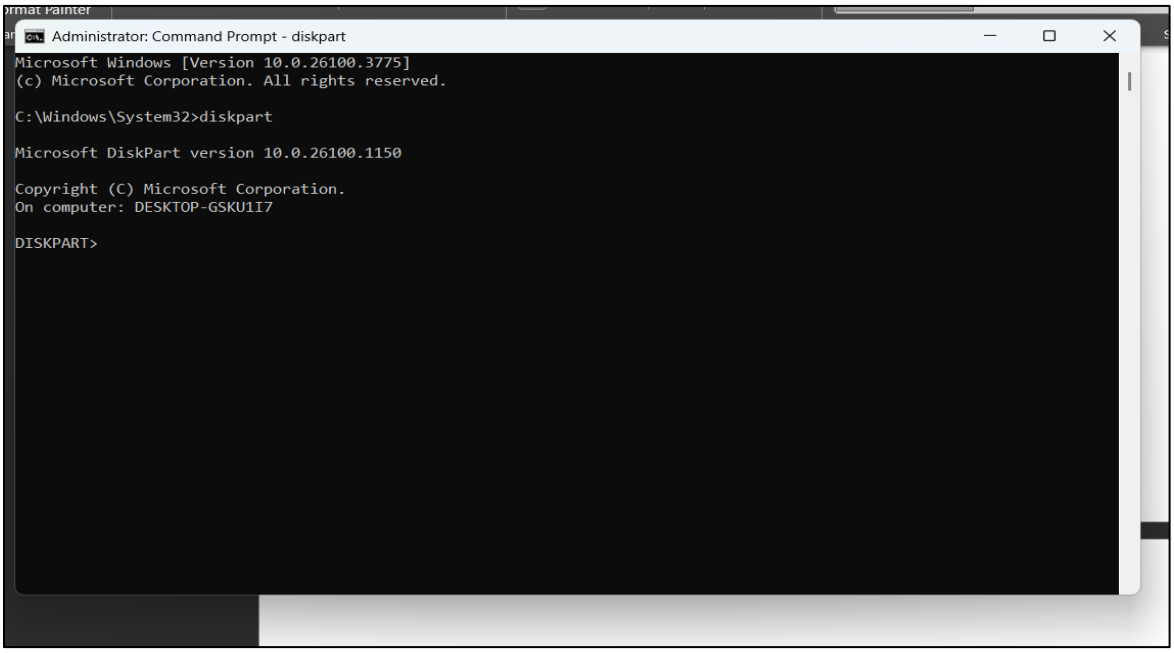
Contents

Setting a USB to Read-Only

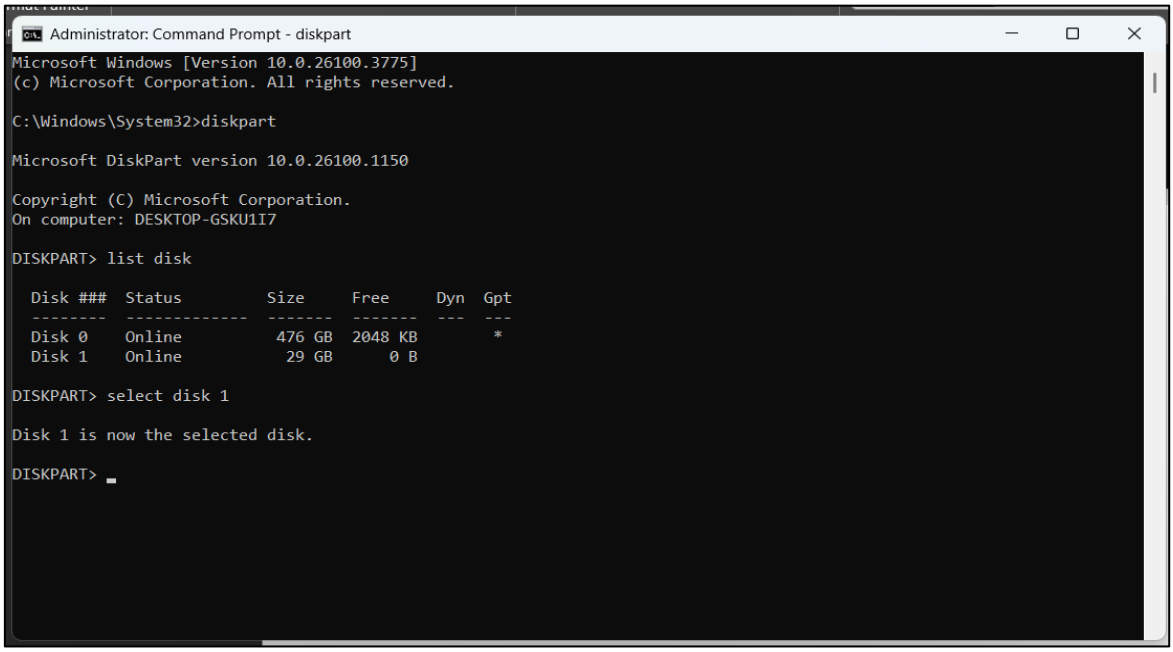
Step 1: Run Command Prompt as Administrator and Open Diskpart Tool

- Press **Windows + S** key together.
- Type **cmd** in the search bar.
- **Right-click** on "**Command Prompt**" → Select "**Run as administrator**".
- In the Command Prompt window, type: diskpart
- Press **Enter**.



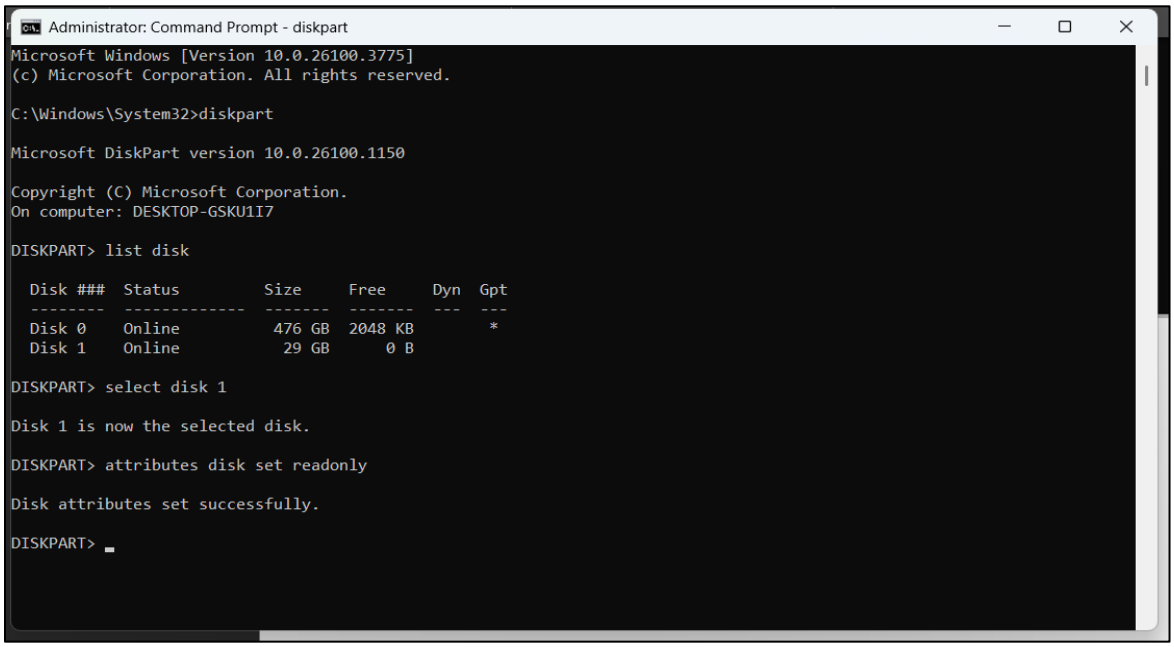
Step 2: List all disks and select your USB drive

- type: list disk; it will show all the disks connected to your computer
- Press Enter.
- Find your USB drive with size
- Type: select disk X (Replace X with your USB's disk number.)
- Press **Enter**



Step 3: Set the USB as Read-Only

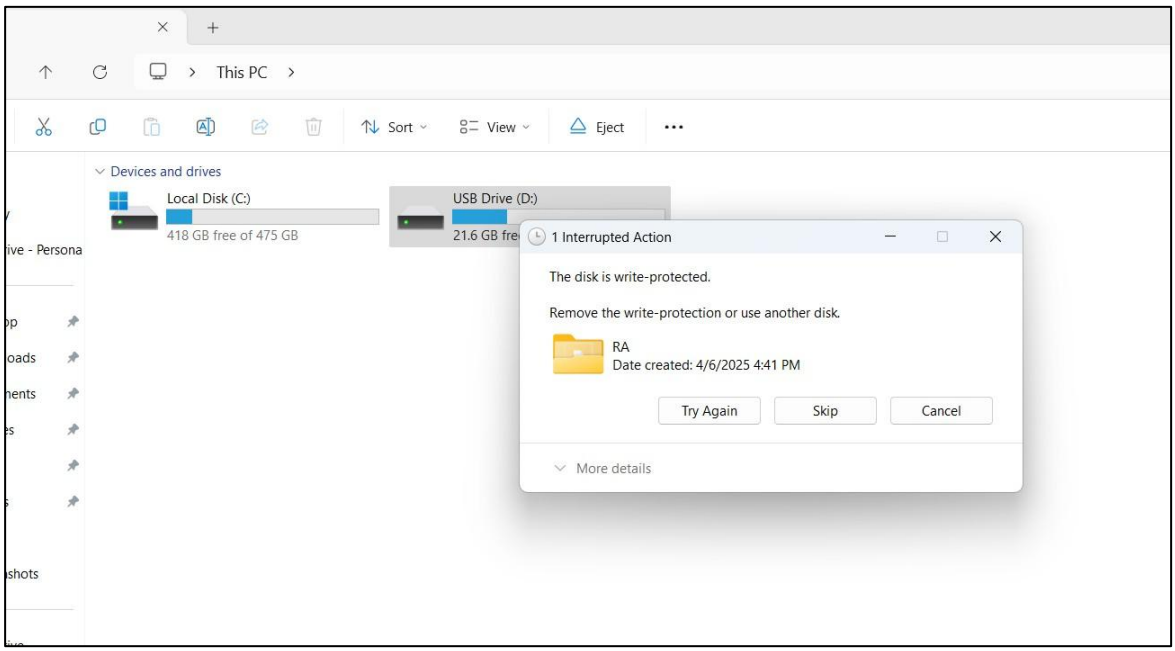
- **type**: attributes disk set readonly
- Press **Enter**, a message will be displayed: **"Disk attributes set successfully**."



Confirm if the USB has been set to read-only

Method 1: Try copying a file

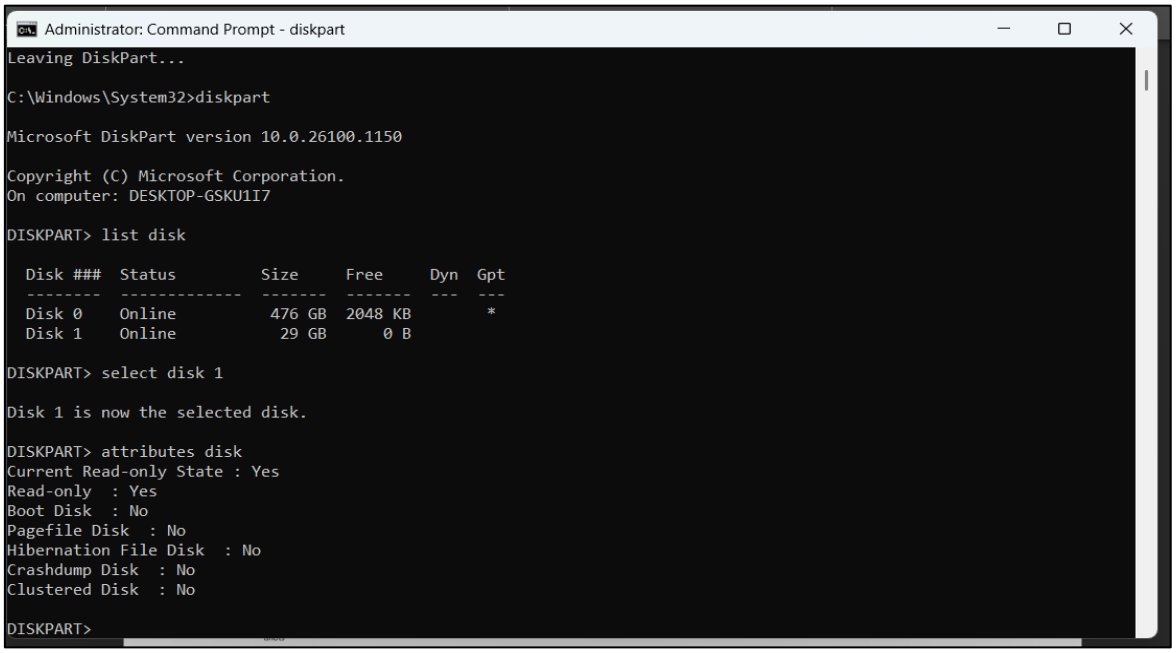
- Open **File Explorer**.
- Try **copying a new file** to the USB.
- Windows will show an **error message** like: "**The disk is write-protected. Remove the write protection or use another disk.**"This error confirms that the USB is read-only.



Method 2: Check using diskpart

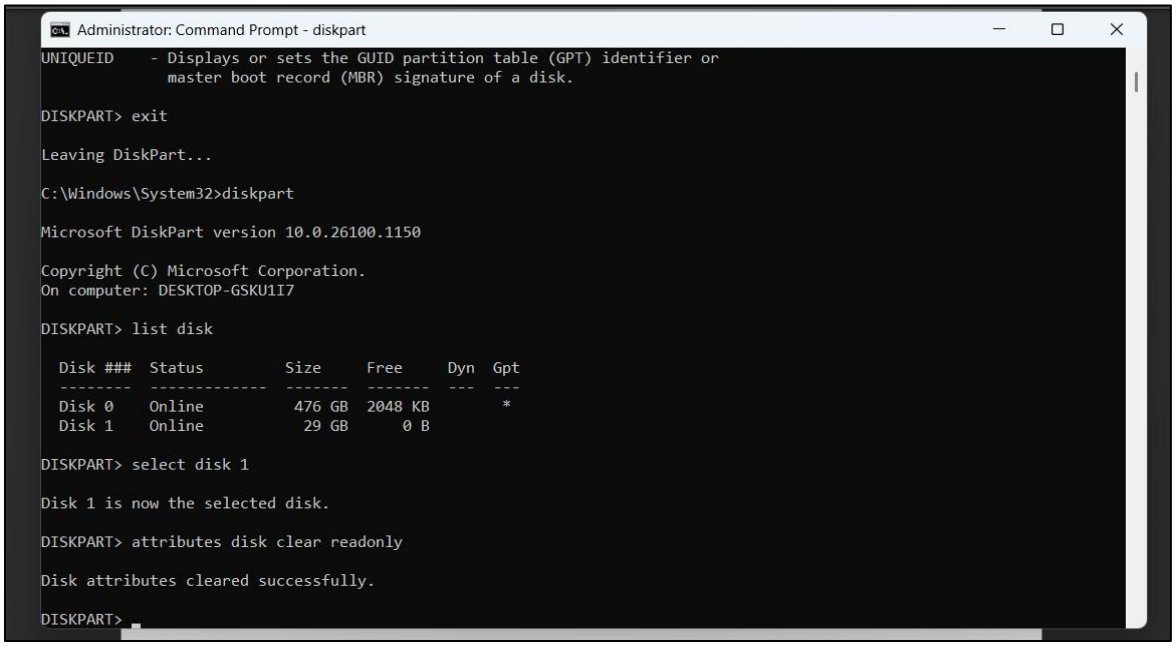
- Open Command Prompt as Administrator
- Type: diskpart → list disk → select disk X (Replace X with USB disk number) → attributes disk

If disk current status is shown as "Current Read-only State": Yes, "Read-only": Yes, then your USB is successfully set as Read-Only.



Remove Write-Protection from USB

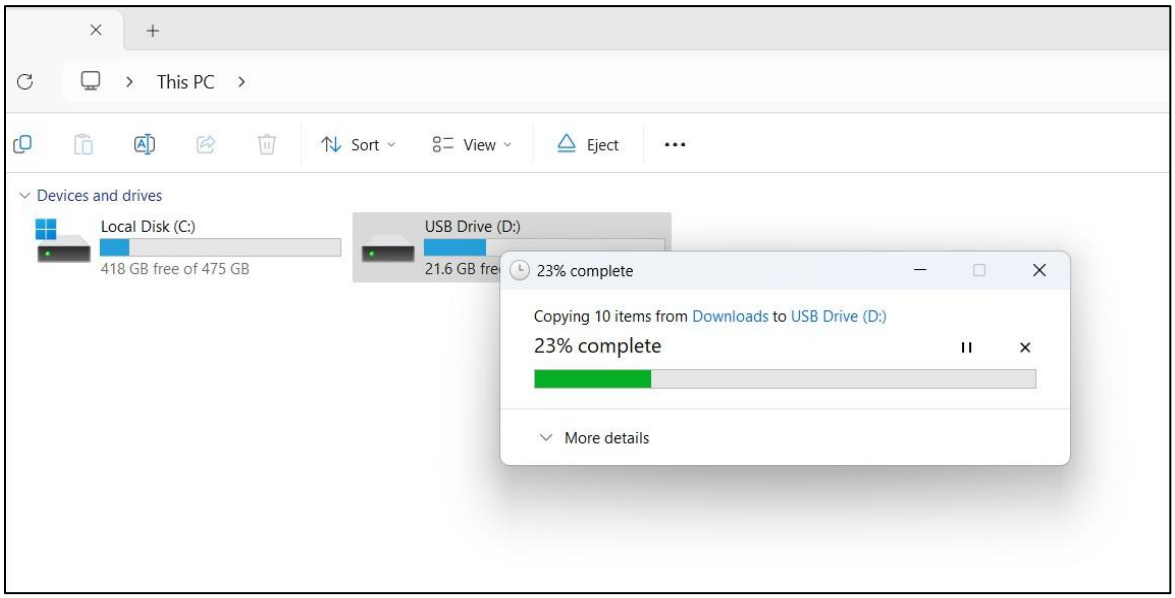
- Open Command Prompt as Administrator
- Type: diskpart → list disk → select disk X (Replace X with USB disk number)
- Type: attributes disk clear readonly.



Confirm USB is No Longer Write-Protected

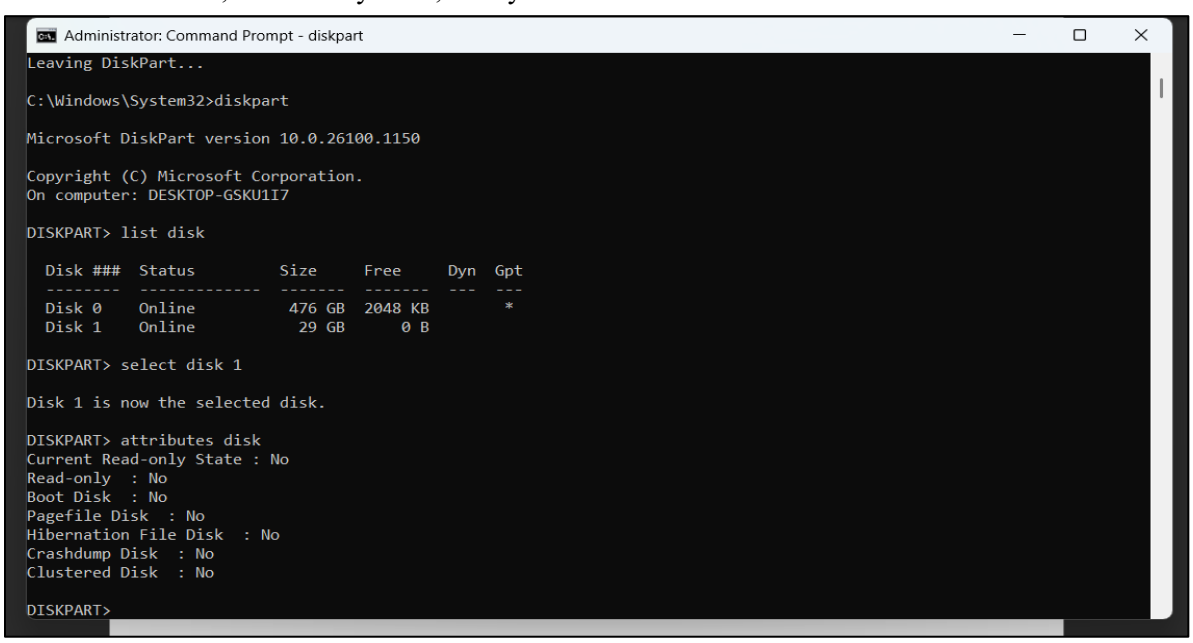
Method 1: Try copying a file

- Open **File Explorer**.
- Try **copying a new file** to the USB.
- If the file copies successfully, your USB is writable again



Method 2: Check using diskpart

- Open Command Prompt as Administrator and type: diskpart → list disk → select disk X (Replace X with USB disk number) → attributes disk. If disk current status is shown as "Current Read-only State": No, "Read-only": No, then your USB is now writable.



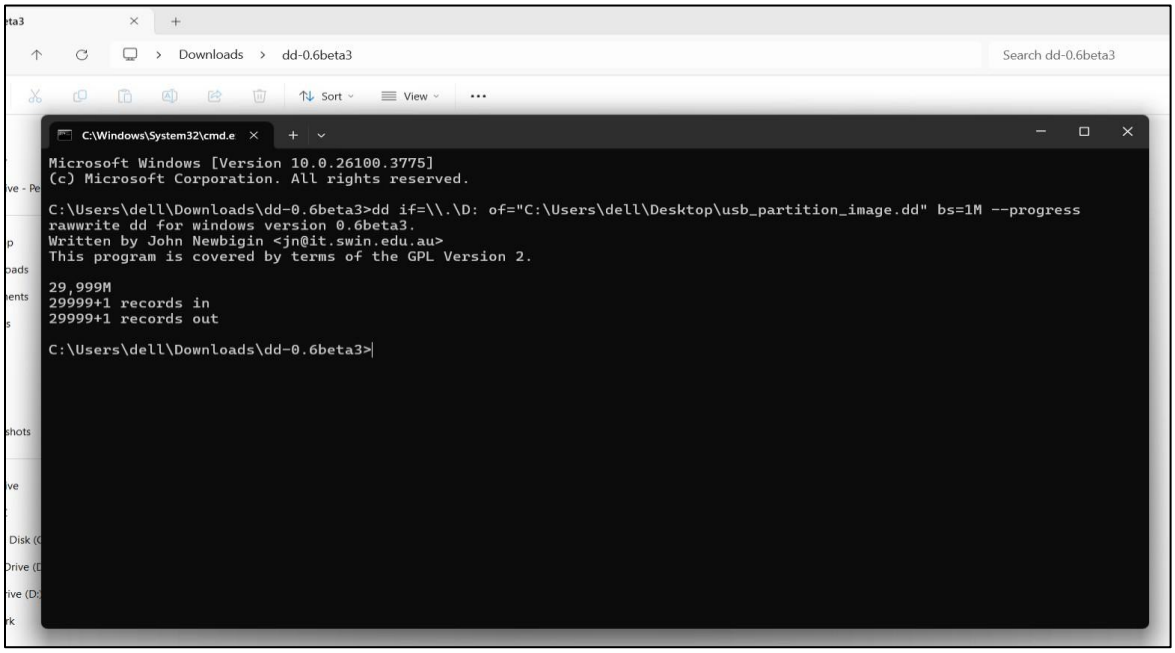
DD Imaging

To create a forensic image of the USB drive, the dd command-line tool is used through **Command Prompt** on a Windows system.

The ‘dd-0.6beta3’ tool is first downloaded and extracted then the following command is entered on the command prompt to begin imaging:

dd if=\\.\D: of="C:\Users\dell\Desktop\usb_partition_image.dd" bs=1M –progress

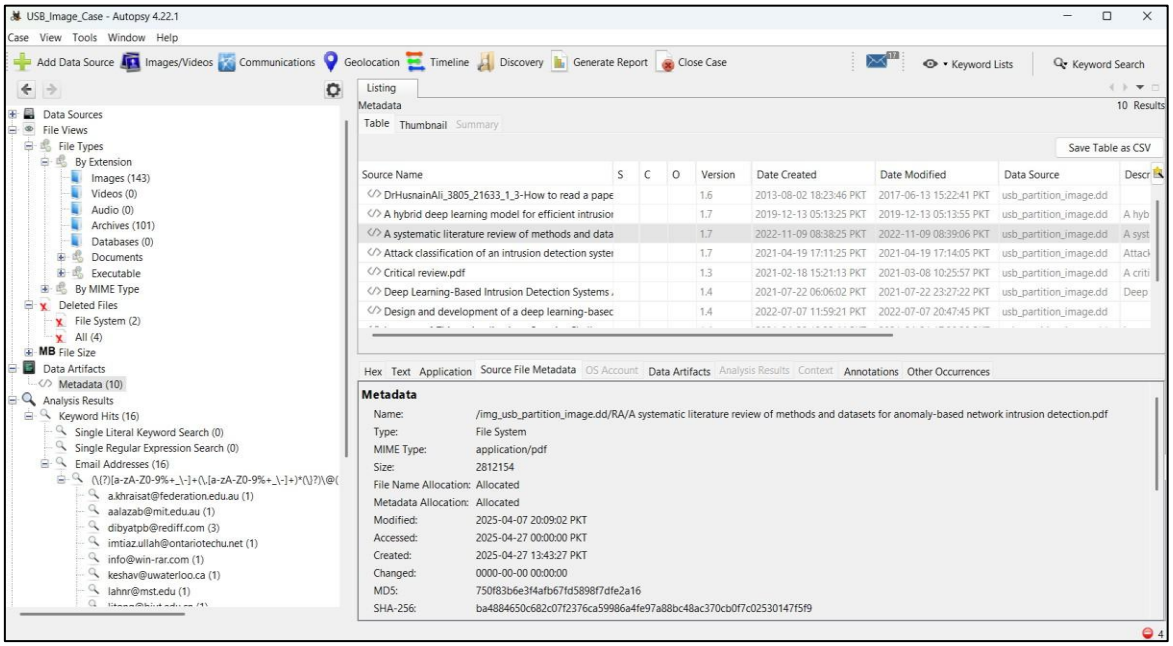
The image below shows the successful creation of the USB disk image.

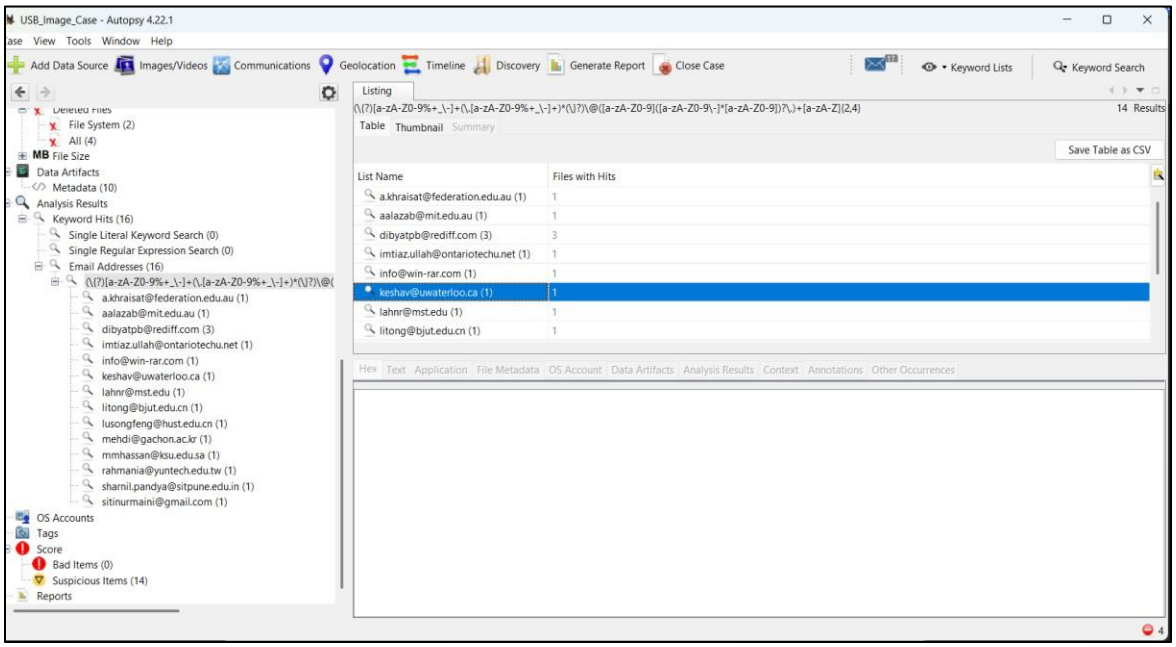


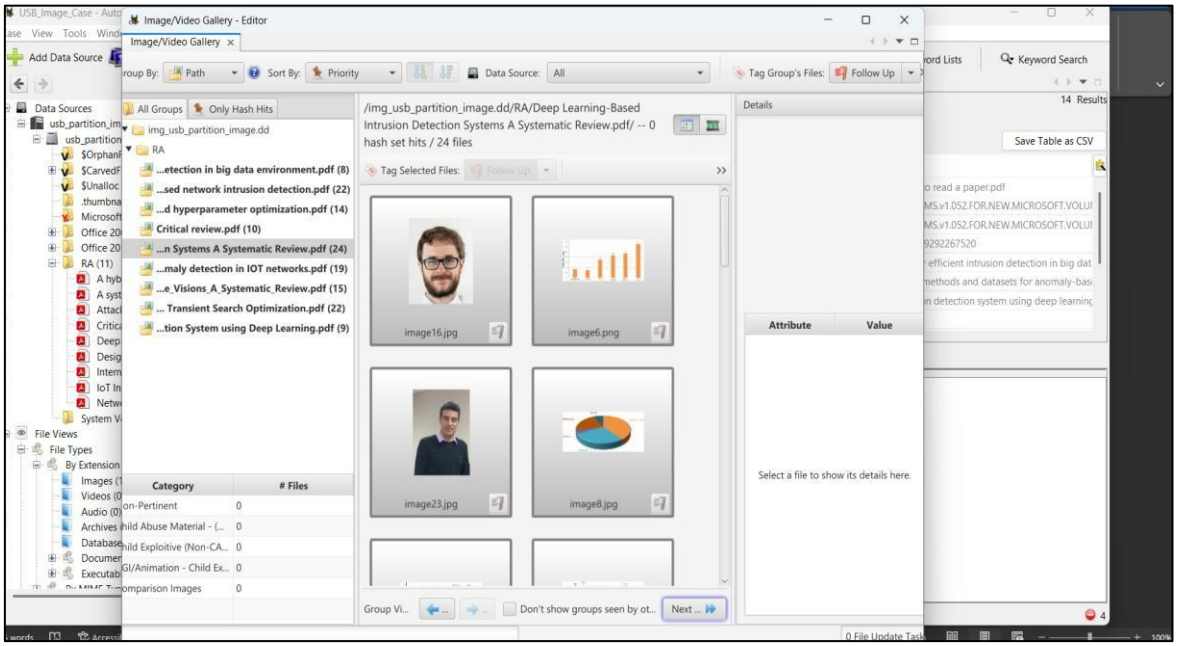
Using Autopsy to Analyze the .dd Image

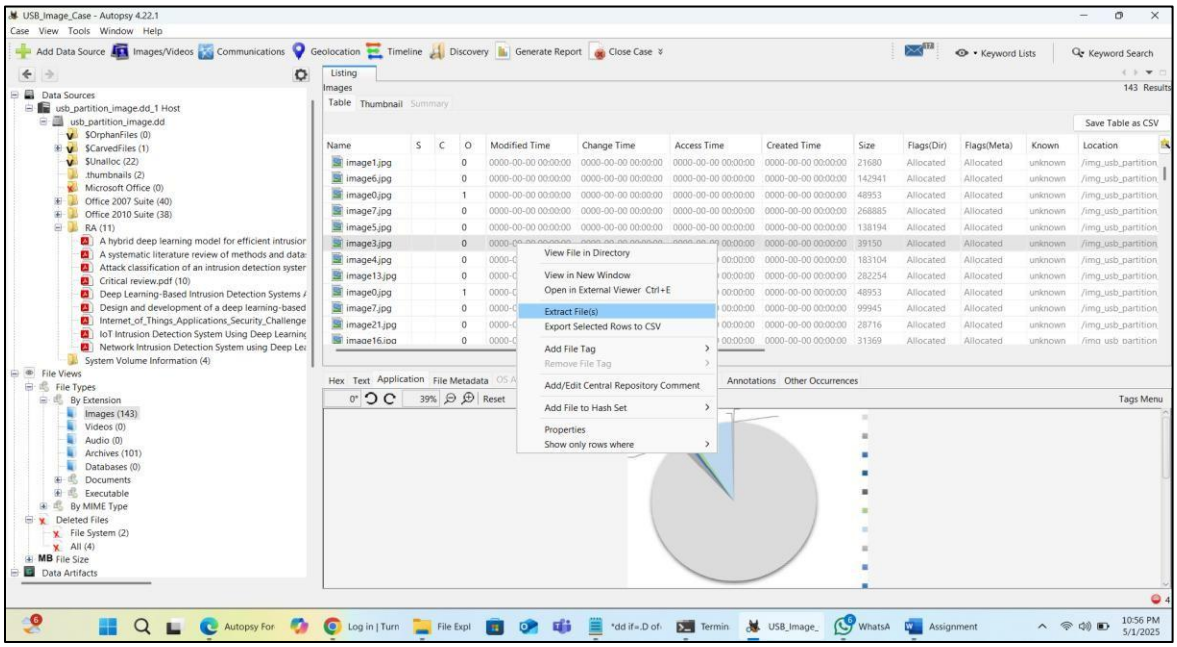
- Launch Autopsy
- Create a New Case
- Add the .dd Image as a Data Source
- Configure Ingest Modules
- Ingestion Progress will start, once completed we can extract files.

Below are the snapshots of the image extracted.

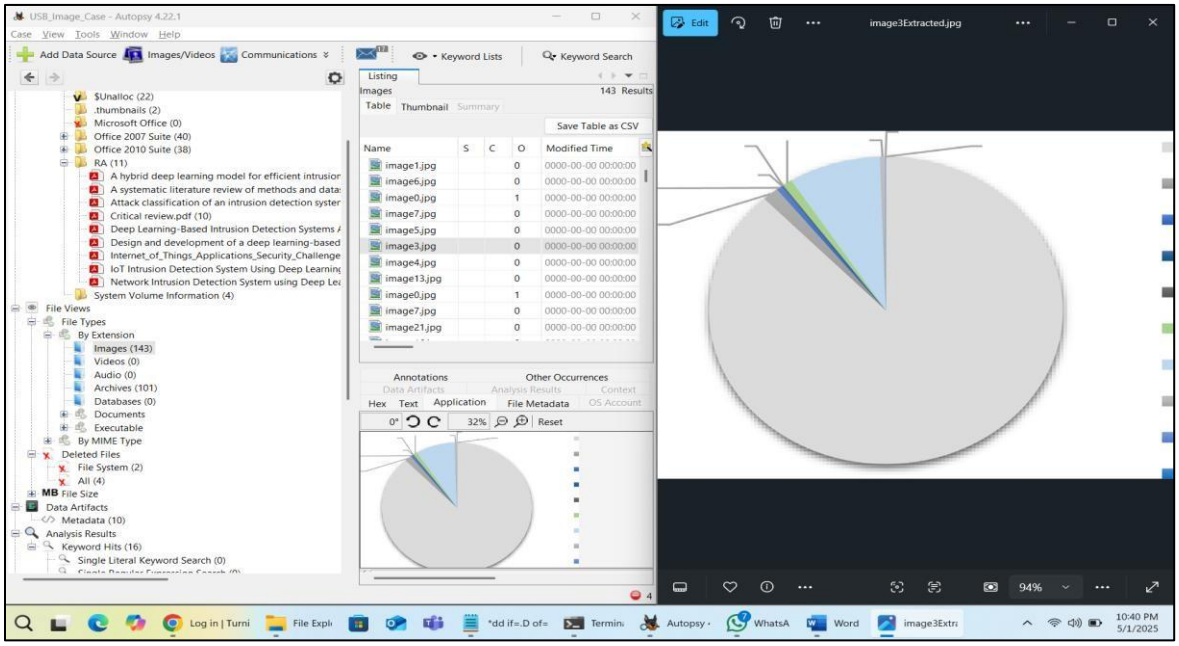

USB_Image_Case - Autopsy 4.22.1
Case View Tools Window Help
Add Data Source Images/Videos Communications Geolocation Timeline Discovery Generate Report Close Case
Keyword Lists Keyword Search
Listing
Metadata
10 Results
Table Thumbnail Summary
Save Table as CSV
Source Name S C O Version Date Created Date Modified Data Source
DrHusnainAli_3805_21633_1_3-How to read a pape 1.6 2013-08-02 18:23:46 PKT 2017-06-13 15:22:41 PKT usb_partition_image.dd
A hybrid deep learning model for efficient intrusion 1.7 2019-12-13 05:13:25 PKT 2019-12-13 05:13:55 PKT usb_partition_image.dd
A systematic literature review of methods and data 1.7 2022-11-09 08:38:25 PKT 2022-11-09 08:39:06 PKT usb_partition_image.dd
Attack classification of an intrusion detection syste 1.7 2021-04-19 17:11:25 PKT 2021-04-19 17:14:05 PKT usb_partition_image.dd
Critical review.pdf 1.3 2021-02-18 15:21:13 PKT 2021-03-08 10:25:57 PKT usb_partition_image.dd
Deep Learning-Based Intrusion Detection Systems 1.4 2021-07-22 06:06:02 PKT 2021-07-22 23:27:22 PKT usb_partition_image.dd
Design and development of a deep learning-basec 1.4 2022-07-07 11:59:21 PKT 2022-07-07 20:47:45 PKT usb_partition_image.dd
Hex Text Application Source File Metadata OS Account Data Artifacts Analysis Results Context Annotations Other Occurrences
Metadata
Name: /img_usb_partition_image.dd/RA/A systematic literature review of methods and datasets for anomaly-based network intrusion detection.pdf
Type: File System
MIME Type: application/pdf
Size: 2812154
File Name Allocation: Allocated
Metadata Allocation: Allocated
Modified: 2025-04-07 20:09:02 PKT
Accessed: 2025-04-27 00:00:00 PKT
Created: 2025-04-27 13:43:27 PKT
Changed: 0000-00-00 00:00:00
MD5: 750f83b6e3f4afb67fd5898f7dfe2a16
SHA-256: ba4884650c682c07f2376ca59986a4fe97a88bc48ac370cb0f7c02530147f5f9


USB_Image_Case - Autopsy 4.22.1
Add Data Source Images/Videos Communications Geolocation Timeline Discovery Generate Report Close Case
Keyword Lists Keyword Search
Listing
14 Results
Table Thumbnail Summary
Save Table as CSV
List Name Files with Hits
a.khraisat@federation.edu.au (1) 1
aalazab@mit.edu.au (1) 1
dibyatpb@rediff.com (3) 3
imtiaz.ullah@ontariotechu.net (1) 1
info@win-rar.com (1) 1
keshav@uwaterloo.ca (1) 1
lahnr@mst.edu (1) 1
litong@bjut.edu.cn (1) 1
Hex Text Application File Metadata OS Account Data Artifacts Analysis Results Context Annotations Other Occurrences

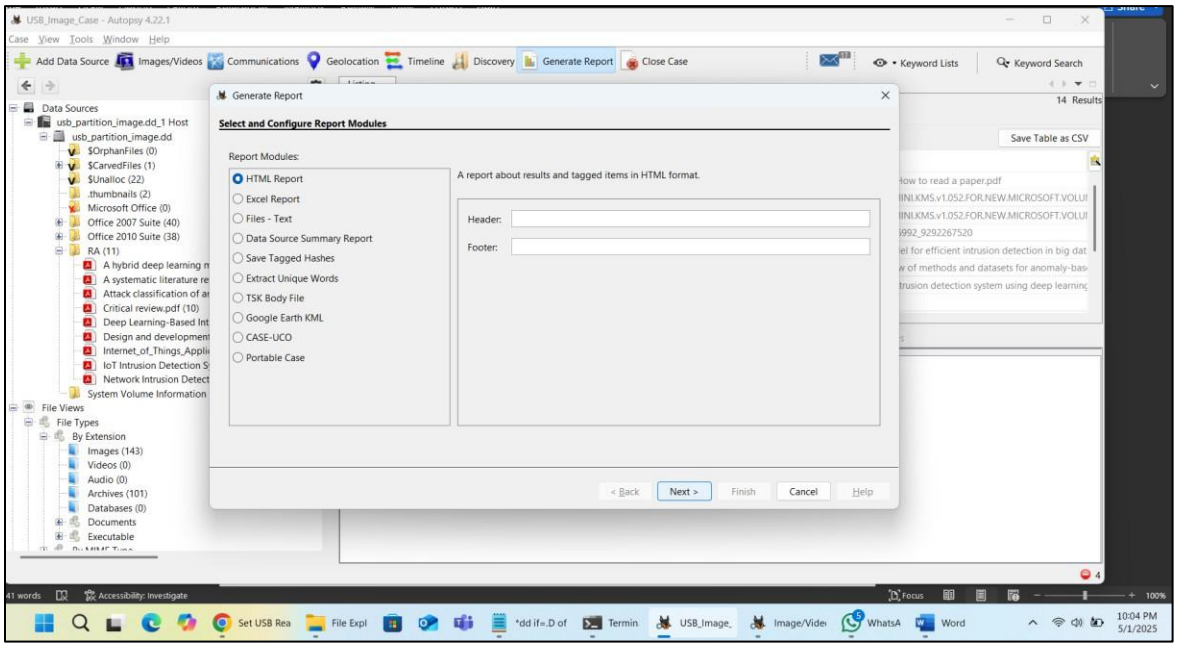

Image/Video Gallery - Editor
Image/Video Gallery
Group By: Path
Sort By: Priority
Data Source: All
Tag Group's Files: Follow Up
All Groups
Only Hash Hits
img_usb_partition_image.dd
RA
...etection in big data environment.pdf (8)
...sed network intrusion detection.pdf (22)
...d hyperparameter optimization.pdf (14)
Critical review.pdf (10)
...n Systems A Systematic Review.pdf (24)
...maly detection in IOT networks.pdf (19)
...e_Visions_A_Systematic_Review.pdf (15)
... Transient Search Optimization.pdf (22)
...tion System using Deep Learning.pdf (9)
/img_usb_partition_image.dd/RA/Deep Learning-Based Intrusion Detection Systems A Systematic Review.pdf/ -- 0 hash set hits / 24 files
Tag Selected Files:
image16.jpg
image6.png
image23.jpg
image8.jpg
Category
Files
Group Vi...
Don't show groups seen by ot...
Next ...
Details
Attribute
Value
Select a file to show its details here.
Data Sources
File Views
File Types
By Extension
Images
Videos
Audio
Archives
Databases
Documents
Executables
By MIME Type
Keyword Lists
Keyword Search
14 Results
Save Table as CSV


USB_Image_Case - Autopsy 4.22.1
Case View Tools Window Help
Add Data Source
Images/Videos
Communications
Geolocation
Timeline
Discovery
Generate Report
Close Case
Keyword Lists
Keyword Search
Listing
Images
Table
Thumbnail
Summary
143 Results
Save Table as CSV
Name
S
C
O
Modified Time
Change Time
Access Time
Created Time
Size
Flags(Dir)
Flags(Meta)
Known
Location
image1.jpg
image6.jpg
image0.jpg
image7.jpg
image5.jpg
image3.jpg
image4.jpg
image13.jpg
image0.jpg
image7.jpg
image21.jpg
image16.jpg
View File in Directory
View in New Window
Open in External Viewer Ctrl+E
Extract File(s)
Export Selected Rows to CSV
Add File Tag
Remove File Tag
Add/Edit Central Repository Comment
Add File to Hash Set
Properties
Show only rows where
Hex
Text
Application
File Metadata
Annotations
Other Occurrences
Tags Menu
Data Sources
usb_partition_image.dd_1 Host
usb_partition_image.dd
$OrphanFiles (0)
$CarvedFiles (1)
$Unalloc (22)
.thumbnails (2)
Microsoft Office (0)
Office 2007 Suite (40)
Office 2010 Suite (38)
RA (11)
System Volume Information (4)
File Views
File Types
By Extension
Images (143)
Videos (0)
Audio (0)
Archives (101)
Databases (0)
Documents
Executable
By MIME Type
Deleted Files
File System (2)
All (4)
File Size
Data Artifacts

Extracted Image



We can export the report in any format, as shown below;



HTML Report for Forensic Case Summary