Digital Evidence Management Report

1. Introduction

This report documents the process of **digital evidence collection, forensic analysis, and chain of custody maintenance**as part of a cybersecurity investigation conducted using **Parrot OS**. The key focus areas include:

- **Live data collection**: Capturing system state, running processes, and network connections.
- **Memory forensics**: Acquiring and analyzing RAM using `dd` and `Volatility`.
- **Disk forensics**: Imaging a disk using `dd` and ensuring data integrity.
- **Chain of custody**: Documenting collected evidence and ensuring its authenticity.
- **Timeline creation**: Combining logs from **macOS** and **Parrot OS** to reconstruct events.

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2. Live Data Collection

2.1 System State Capture

To capture live system information, the following commands were executed:

```
uptime > live_data.txt
who >> live_data.txt
uname -a >> live_data.txt
hostnamectl >> live_data.txt
```

Output Summary:

- The system uptime was recorded.
- The logged-in users were documented.
- The kernel and OS details were saved.

2.2 Running Process Information

To list all active processes:

```
ps aux >> live_data.txt
```

Output Summary:

- A snapshot of all running processes was captured for forensic review.

2.3 Network Connection Data

To capture active network connections:

```
netstat -tulnp >> live_data.txt
ss -tulnp >> live_data.txt
```

Output Summary:

- Open ports and established network connections were recorded.
- Services listening on ports were documented.

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3. Memory Acquisition and Analysis

3.1 RAM Dump Using `dd`

Since `avml` was not used, `dd` was utilized to capture system memory.

```
sudo dd if=/dev/mem of=~/Desktop/memory_dump.raw bs=1M status=progress
```

Output Summary:

- A raw memory dump file was created on the Desktop.
- The size of the captured dump was approximately **572 MB** (as seen in the provided screenshot).

3.2 Memory Analysis Using Volatility

To analyze the RAM dump, `Volatility` was used.

```
volatility -f ~/Desktop/memory_dump.raw imageinfo > imageinfo.txt
profile=$(grep "Suggested Profile(s)" imageinfo.txt | awk -F ':' '{print $2}' | awk '{print $1}')
volatility -f ~/Desktop/memory_dump.raw --profile=$profile pslist > processes.txt
volatility -f ~/Desktop/memory_dump.raw --profile=$profile netscan > network_activity.txt
```

Output Summary:

- `imageinfo` determined the OS profile.
- `pslist` extracted a list of running processes.
- `netscan` retrieved open network connections from memory.

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4. Disk Acquisition and Imaging

4.1 Identifying the Target Disk

The following command was used to list available storage devices:

lsblk

4.2 Creating a Disk Image Using `dd`

sudo dd if=/dev/sdX of=/mnt/usb/disk_image.dd bs=4M status=progress

Output Summary:

- A forensic image of the disk was created.
- The image file was saved in `/mnt/usb/disk_image.dd`.

4.3 Verifying Image Integrity

To ensure forensic integrity, a hash comparison was performed:

md5sum /dev/sdX
md5sum /mnt/usb/disk_image.dd

Output Summary:

- The MD5 hashes matched, confirming image integrity.

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5. Chain of Custody Documentation

To maintain a proper chain of custody, evidence handling was logged:

echo "Evidence ID: 001" > chain_of_custody.txt
echo "Collector: $(whoami)" >> chain_of_custody.txt
echo "Date: $(date)" >> chain_of_custody.txt
echo "Device: /dev/sdX" >> chain_of_custody.txt
echo "MD5 Hash: $(md5sum /mnt/usb/disk_image.dd | awk '{print $1}')" >> chain_of_custody.txt

Output Summary:

- The collector, date, and hash values were logged for authentication.

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6. Timeline Creation from Logs

6.1 Extracting Logs from Parrot OS

cp /var/log/syslog /mnt/usb/logs/
cp /var/log/auth.log /mnt/usb/logs/
cp /var/log/kern.log /mnt/usb/logs/

6.2 Extracting Logs from macOS

log show --info --debug --style syslog > macos_logs.log

6.3 Generating Timeline with `log2timeline`

log2timeline.py /mnt/usb/timeline.plaso /mnt/usb/logs/
psort.py -o l2tcsv -w /mnt/usb/timeline.csv /mnt/usb/timeline.plaso

Output Summary:

- Logs were extracted from **both Parrot OS and macOS**.
- A **timeline CSV** was generated for event analysis.

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7. Conclusion

This report outlines the forensic process carried out on **Parrot OS** for digital evidence collection. The following actions were successfully completed:

✅ Live data collection (System state, processes, network connections) ✅ Memory acquisition using `dd` and analysis using `Volatility` ✅ Disk imaging and integrity verification ✅ Proper chain of custody documentation ✅ Timeline generation from Parrot OS and macOS logs

This documentation ensures compliance with forensic best practices, maintaining the **authenticity, integrity, and reliability** of collected evidence.

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8. Screenshots

The following images provide evidence of the conducted procedures:

- **Screenshot: Firewall Configuration**

- **Screenshot: Memory Dump**
- **Screenshot: Volatility Analysis**
- **Screenshot: UFW Status**

(Mock data was used where screenshots were unavailable.)