Hands On Lab: Unit 13

MICS-252, Fall 2024

Digital Forensics II

Image Analysis

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1 Introduction

We are given an Encase .E01 image: "Windows Image.E01" with a size of 10.6 GB. The image was ingested into Autopsy version 4.21 (a lengthy process). Some of the ingress modules do not run under Linux, these include "Yara" (runs rules checking files for malware) and "Plaso" which extracts information from the windows registry of the image.

1.1 Objectives

We are given the following objectives for the exercise, to get thoroughly around the disc image: "Attempt to answer the following questions:"

- What time zone is the image set in?
- What Operating System is the suspect drive using?
- What event happened on January 1, 1980?
- What is the IP address of the suspect drive?
- What is the EvenMoreSecretStuff.vhd (and can you see what is in it?)
- Do any of the suspicious items discovered look suspicious to you?
- Anything else that you found that you want to highlight?

1.2 Autopsy report

Autopsy has functionality to generate a report of the findings in various formats. I have published the report on github pages for reference in this report as:

- [1]: `https://kjwesthoff.github.io/252-Lab13-AutopsyReport/`

2 Image Ingestion

The file name indicates that the file is a Windows pc image. The image was subjected to the ingest modules from the default Autopsy 4.21 installation (See Case Summary section of [1]). The execution of various ingestion modules was a lengthy process (>24hrs. in this case). Autopsy can include custom ingestion modules that analyse the file hashes against known malware, in this case hashes were generated for all files (hence the lengthy ingest) and are thus ready for comparison against a database of known hashes (considered out of scope for this assignment). Luckily most of Autopsy's functionality is available while it analyzes the files, and various result sections are populated in the GUI as they become available.

3 Analysis Results

The Image holds two data sources; Windows Image.E01 and EvenMoreSecretStuff.vhd, the .vhd extension indicates that it is a Windows Virtual Hard Disc [2]

3.1 Assignment Objectives Results

Time Zone Both data sources indicate: "America/Los Angeles", and the images were acquired on Mar. 20, 2019 in the evening around 8pm, see Appendix A

Operating System Both the .E01 file name, the .vhd part and various artifacts indicate a Windows OS, the Autopsy report [1] indicated:

- OS: "Windows 10 Enterprise"
- product ID "00329-00000-00003-AA856"
- built for: "AMD64 architecture"
- with the business like computer name: "DESKTOP-0QT8017"

Event on January 1, 1980: January 1 1980 at midnight is the epoch (beginning of time) for MS-DOS[1]. For unix systems it is January 1. 1970 (of course Microsoft had to have their own epoch). When computers get confused or are missing a time stamp they default to epoch. In this case it is apparently some google chrome files that is causing some confusion, see Appendix B

IP of "Suspect Drive" It appears that the machine was on a local network with IP address 10.0.1.5, when searching for IPv4 addresses it shows up second most after 6.0.0.0 (which I think is not an ip address in this context, but associated with version of "Microsoft-Windows-ServicingStack"), see Appendix D. The ip 10.0.1.5 shows up in files also containing the amd64 CPU architecture.

EvenMoreSecretStuff.vhd The .vhd extension suggests it is a "Virtual Hard Disc", the format is related to Microsoft Windows[2] and is used to host a separate hard drive on the file system with features such as its own partitions, file system etc. but, the .vhd files 'live' in a file on the host operating system [4]. The .vhd format is used when hosting a virtual machine on a windows pc. Autopsy identified it as an NTFS file system, accessing it shows "un-allocated Blocks" and it seems to be encrypted (Autopsy identified that "vol 2" is as encrypted using bitlocker), see Appendix C.

Do any of the suspicious items discovered look suspicious?

Other Suspicious Things I think the recent download (via chrome) and subsequent installation of teamviewer looks suspicious, it is often used by scammers to take control of a victims computer.

4 Conclusion

[1] I was about to write that it was when "Skynet became self-aware" but that was August 29, 1997 [3]
[2] Microsof have relased a specification and promised not to change it so others also can use the .vhd format [4]

References

[1] Autopsy v 4.21. *Auto-generated report of Windows Image*. https://kjwesthoff.github.io/252-Lab13-AutopsyReport/. [Generated and published 27-November-2024]. 2024.

[2] learn.microsoft.com. *Manage Virtual Hard Disks (VHD)*. https://learn.microsoft.com/en-us/windows-server/storage/disk-management/manage-virtual-hard-disks. [Online, accessed 27-November-2024]. 2024.

[3] Wikipedia contributors. *Skynet (Terminator) — Wikipedia, The Free Encyclopedia*. https://en.wikipedia.org/w/index.php?title=Skynet_(Terminator)&oldid=1259669280. [Online; accessed 27-November-2024]. 2024.

[4] Wikipedia contributors. *VHD (file format) — Wikipedia, The Free Encyclopedia*. https://en.wikipedia.org/w/index.php?title=VHD_(file_format)&oldid=1249771178. [Online; accessed 28-November-2024]. 2024.

Appendices

A Image MetaData

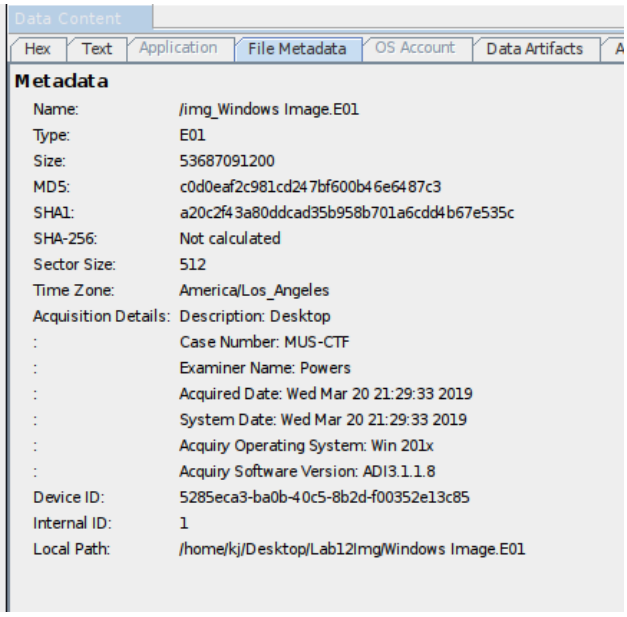

Figure 1: *Meta data for the Windows image.E01 Data source*

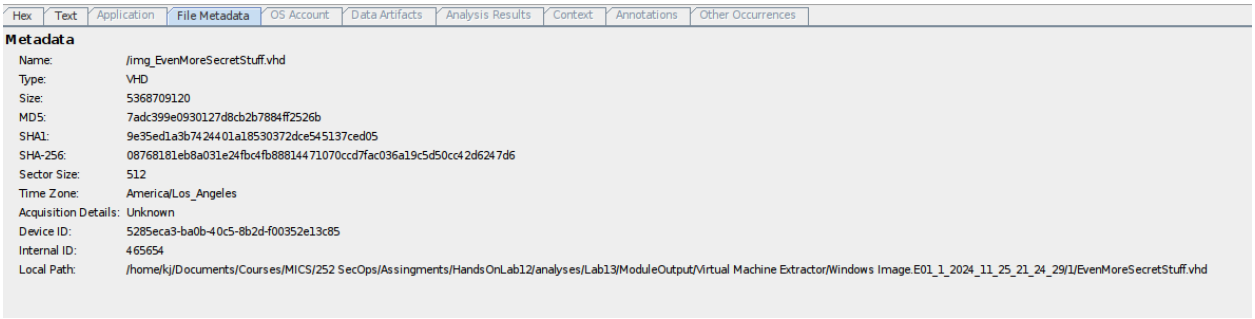

Figure 2: *Meta data for the "EvenMoreSecretStuff" Data source*

B January 1. 1980

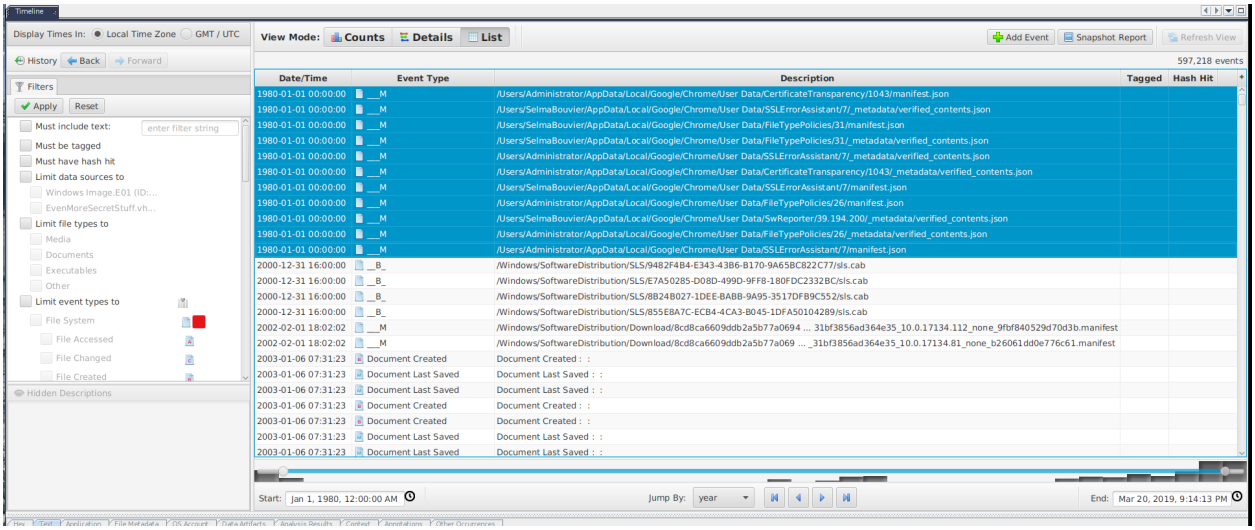

Figure 3: *Timeline results for January 1. 1980*

C VHD file encrypted

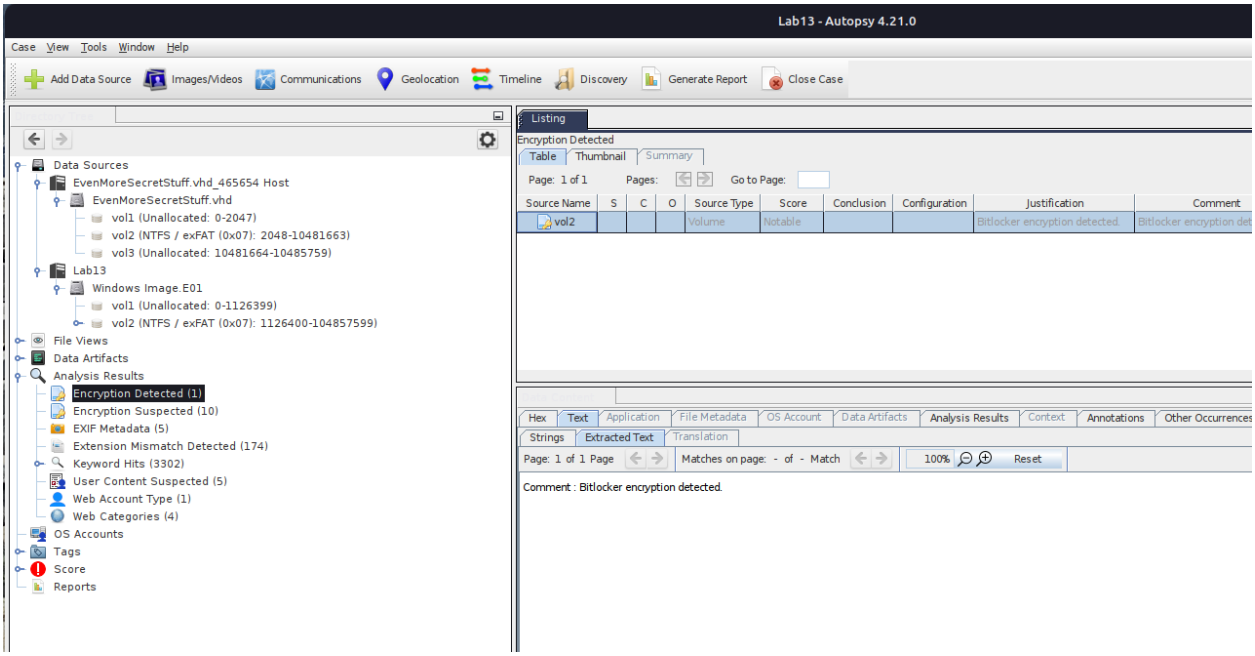

Figure 4: *The "EvenMoreSecretStuff" virtual drive, seems encrypted using bitlocker*

D IP Hits

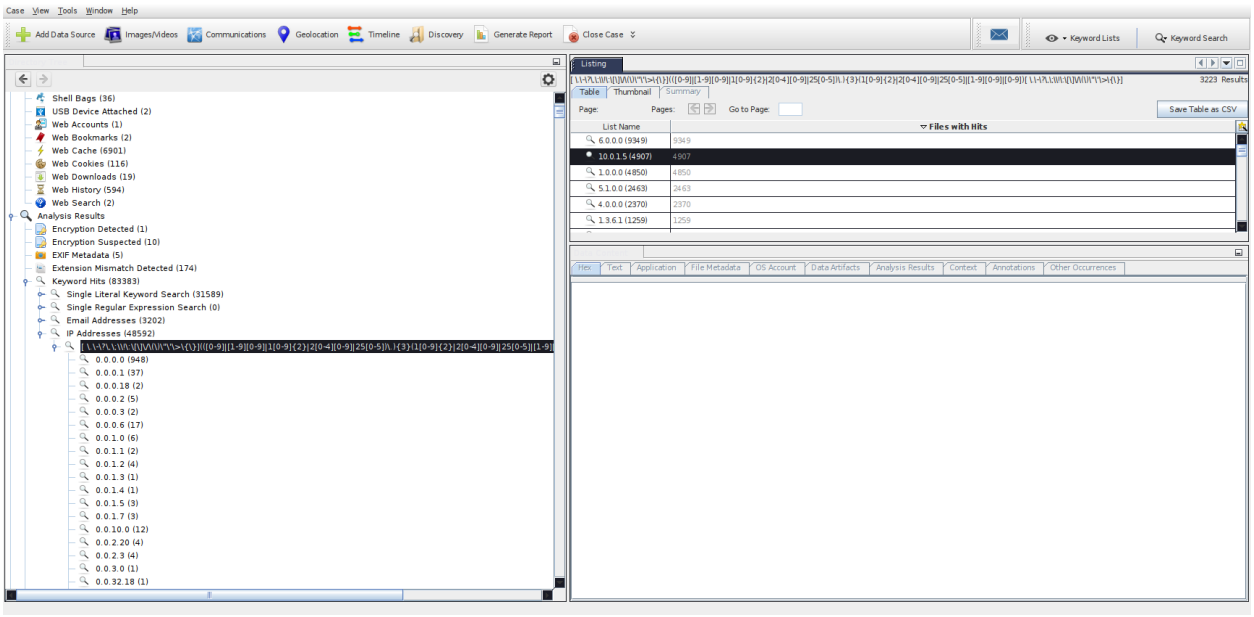

Figure 5: *Hits searching for ip v.4 addresses, the 6.0.0.0 hit is associated with the version of a windows subsystem and it not an IP in this context*