Forensic Analysis Notes:

Case Information:

Case: Analyzing Firefox Browser History

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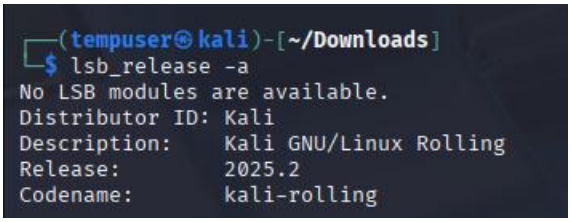
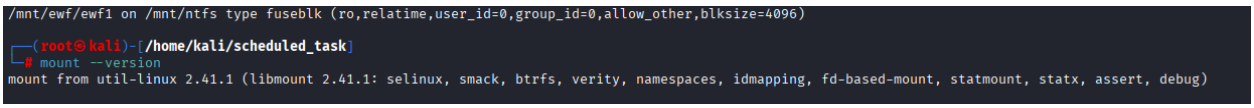
Id	File name	Hash(None)	Notes
1	Disk image	Zipped windows image	Suspicious browser activity

Tools and Environment

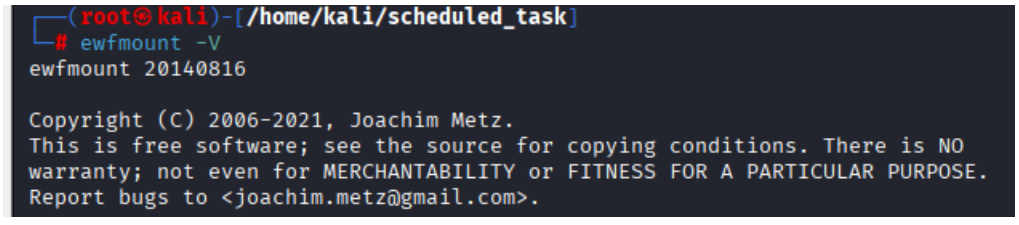
Kali Linux v2025.2



mount v2.41.1 to attach filesystem like(USB, partition, hard drive, and ISO image) to existing directory structure



Ewfmount : Mount expert witness format (ewf) as a raw disk for analysis



/mnt/hgfs/: created a shard folder to allow the virtual machine to access the folder on my external SanDisk driver

```
┌──(root㉿kali)-[/home/kali/scheduled_task]
└─# ls -lah /mnt/hgfs/
total 21K
dr-xr-xr-x 1 root root 4.1K Sep 27 23:09 .
drwxr-xr-x 5 root root 4.0K Sep 27 21:05 ..
drwxrwxrwx 1 root root    0 Sep 27 19:17 BackUps
drwxrwxrwx 1 root root  12K Sep 27 19:20 certificates
```

```
┌──(root㉿kali)-[/home/kali/scheduled_task]
└─# mount | grep hgfs
vmhgfs-fuse on /mnt/hgfs type fuse.vmhgfs-fuse (rw,nosuid,nodev,relatime,user_id=0,group_id=0,allow_other)

┌──(root㉿kali)-[/home/kali/scheduled_task]
```

Grep v3.11

```
┌──(tempuser㉿kali)-[~/Downloads]
└─$ grep -V
grep (GNU grep) 3.11
Copyright (C) 2023 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html
>.
```

Cat:

```
┌──(root㉿kali)-[/home/kali/scheduled_tasks]
└─# cat --version
cat (GNU coreutils) 9.7
Packaged by Debian (9.7-3)
Copyright (C) 2025 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Written by Torbjörn Granlund and Richard M. Stallman.
```

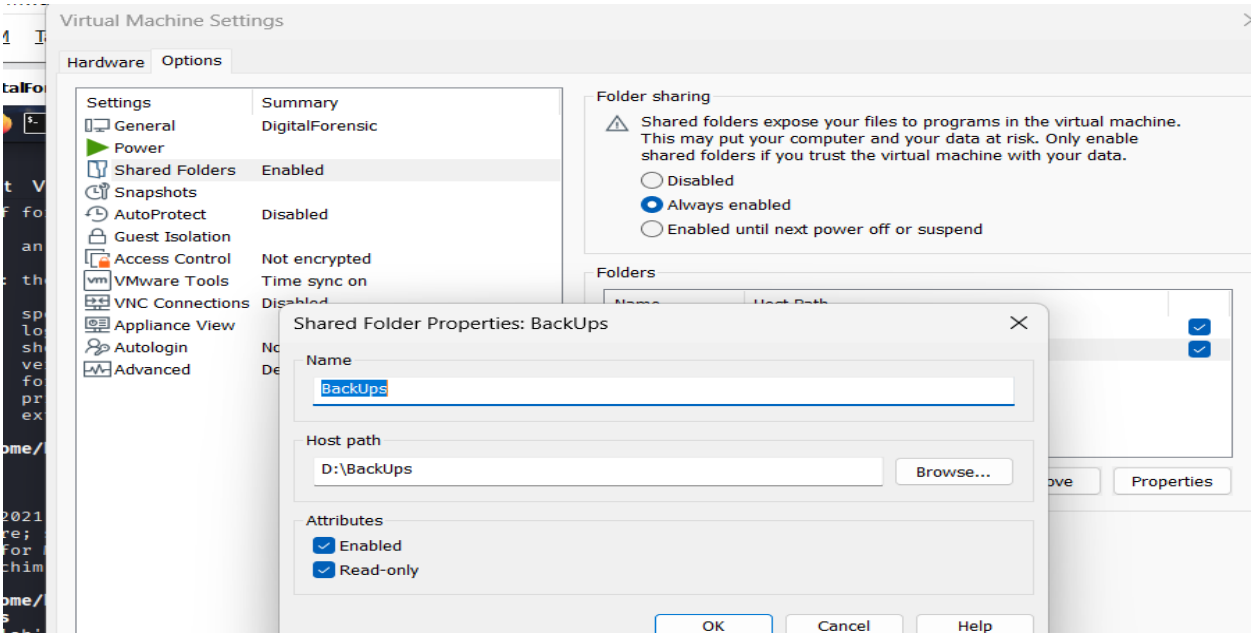
cop v9.7 for copying files and directories

```
┌──(root㉿kali)-[/mnt/ntfs]
└─# cp --version
cp (GNU coreutils) 9.7
Packaged by Debian (9.7-3)
Copyright (C) 2025 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Written by Torbjörn Granlund, David MacKenzie, and Jim Meyering.
```

SQLite3 v3.46.1 that stores structured data for interaction with applications

```
┌──(kali㉿kali)-[/mnt/ntfs]
└─$ sqlite3 --version
3.46.1 2024-08-13 09:16:08 c9c2ab54ba1f5f46360f1b4f35d849cd3f080e6fc2b6c60e91b16c63f69aalt1 (64-bit)

┌──(kali㉿kali)-[/mnt/ntfs]
```

Step 1: Created a shared folder to allow the virtual machine (VM) to access the **backup** folder located at *D:\holders* on the external drive. This folder contains the disk image.



Step 2: Mount manually to allow vm to share the shared folder

```
┌──(root㉿kali)-[/home/kali]
└─# vmhgfs-fuse .host:/ /mnt/hgfs -o allow_other
```

copied from chatGPT

Fix on Kali

Try remounting manually:

bash Copy code

```
sudo vmhgfs-fuse .host:/ /mnt/hgfs -o allow_other
```

Analysis Steps :

Step3 : Created the directory where the image should be mounted and used the **ewfmount** command to mount the image

Command:

```
┌──(root㉿kali)-[~]
└─# mkdir /mnt/ewf/
```

Result: Directory was created

Status: Worked

Step4 : Mount the image to directory created

Command

```
┌──(root㉿kali)-[/home/kali]
└─# ewfmount /mnt/hgfs/BackUps/CS436/CS436_Windows11_PWNED.E01  /mnt/ewf/
ewfmount 20140816
```

Result: The entire image was mounted in the /mnt/ewf/ directory

Status: worked

Step 5: List the characteristics of the mounted drive

```
┌──(root㉿kali)-[/home/kali]
└─# fdisk -l /mnt/ewf/ewf1
Disk /mnt/ewf/ewf1: 70 GiB, 75161927680 bytes, 146800640 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: gpt
Disk identifier: 530B465D-65A0-41F3-9A2F-D76BBD90DE2C

Device                Start       End   Sectors  Size Type
/mnt/ewf/ewf1p1        2048    206847    204800  100M EFI System
/mnt/ewf/ewf1p2      206848    239615     32768   16M Microsoft reserved
/mnt/ewf/ewf1p3      239616 145481727 145242112 69.3G Microsoft basic data
/mnt/ewf/ewf1p4 145481728 146796543   1314816  642M Windows recovery environment
```

Result: Partitions captured were listed, with the sector starting **at 239616**

Status: Worked

Step 5: Mount the NTFS partitions

Command:

```
┌──(root㉿kali)-[/home/kali]
└─# mount -t ntfs-3g -o ro,loop,offset=122683392,show_sys_files,streams_interface=windows /mnt/ewf/ewf1 /mnt/ntfs
```

Result: The disk image was mounted as read-only at /mnt/ntfs

Status: Worked

Step 6: listed all contents from the disk image mounted at /mnt/ntfs

```
┌──(root㉿kali)-[/mnt/ntfs]
└─# ls -la
total 1757044
drwxrwxrwx 1 root root       4096 Jul 19 20:11  .
drwxr-xr-x 5 root root       4096 Sep 27 23:35  ..
-rwxrwxrwx 1 root root       2560 Jul 19 07:32 '$AttrDef'
-rwxrwxrwx 1 root root          0 Jul 19 07:32 '$BadClus'
-rwxrwxrwx 1 root root    2269408 Jul 19 07:32 '$Bitmap'
-rwxrwxrwx 1 root root       8192 Jul 19 07:32 '$Boot'
drwxrwxrwx 1 root root          0 Jul 19 07:32 '$Extend'
-rwxrwxrwx 1 root root   67108864 Jul 19 07:32 '$LogFile'
-rwxrwxrwx 1 root root  236453888 Jul 19 07:32 '$MFT'
-rwxrwxrwx 1 root root       4096 Jul 19 07:32 '$MFTMirr'
drwxrwxrwx 1 root root          0 Jul 19 10:39 '$Recycle.Bin'
-rwxrwxrwx 1 root root          0 Jul 19 07:32 '$Secure'
-rwxrwxrwx 1 root root     131072 Jul 19 07:32 '$UpCase'
-rwxrwxrwx 1 root root          0 Jul 19 07:32 '$Volume'
lrwxrwxrwx 2 root root         15 Jul 19 06:42 'Documents and Settings' → /mnt/ntfs/Users
-rwxrwxrwx 2 root root      12288 Jul 19 19:50  DumpStack.log.tmp
drwxrwxrwx 1 root root          0 Jul 19 05:13  inetpub
drwxrwxrwx 1 root root          0 Jul 19 05:41  OneDriveTemp
-rwxrwxrwx 1 root root 1476395008 Jul 19 19:50  pagefile.sys
drwxrwxrwx 1 root root          0 Apr  1  2024  PerfLogs
drwxrwxrwx 1 root root       4096 Jul 19 10:42  ProgramData
drwxrwxrwx 1 root root       4096 Jul 19 20:10 'Program Files'
drwxrwxrwx 1 root root       4096 Jul 19 10:42 'Program Files (x86)'
drwxrwxrwx 1 root root          0 Jul 19 05:01  Recovery
-rwxrwxrwx 1 root root   16777216 Jul 19 19:50  swapfile.sys
drwxrwxrwx 1 root root       4096 Jul 19 05:29 'System Volume Information'
drwxrwxrwx 1 root root       4096 Jul 19 10:40  Users
drwxrwxrwx 1 root root      16384 Jul 19 05:42  Windows
drwxrwxrwx 1 root root          0 Jul 19 07:38  Windows.old
```

Step 7: Created a directory to hold all Firefox artifacts collected from partitions

```
┌──(kali㉿kali)-[/mnt/ntfs]
└─$ mkdir /home/kali/Firefox_artifacts

┌──(kali㉿kali)-[/mnt/ntfs]
└─$
```

Step 8: 1Traverse to the Firefox user profile on the system using the NTFS file system. This will provide information about bookmarks, cookies, history, extensions, and other user-related activities in the browser

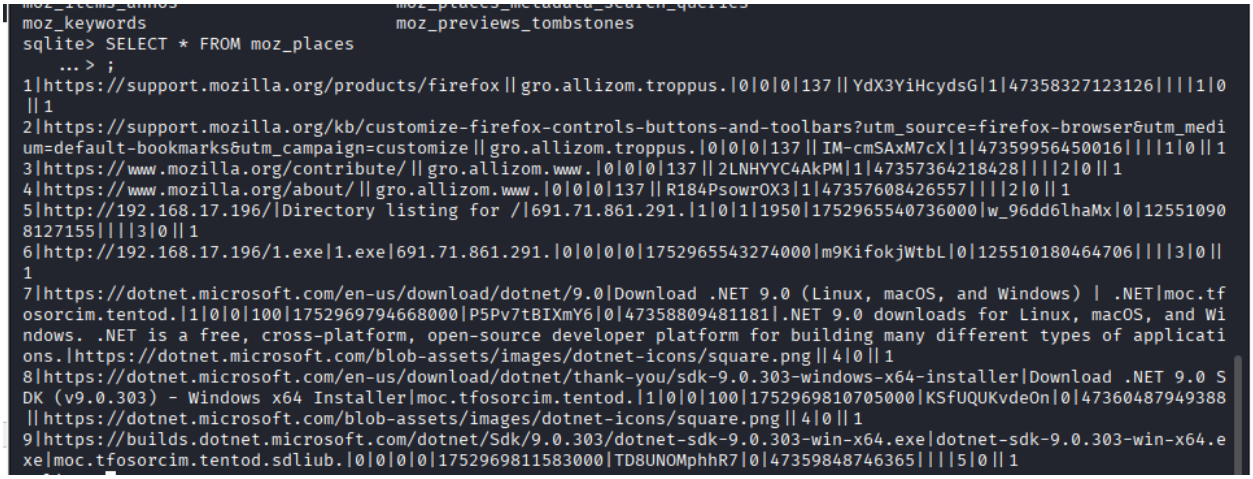
```
┌──(root㉿kali)-[/]
└─# cd mnt/ntfs/Users/cs436/AppData/Roaming/Mozilla/Firefox/Profiles/94mc0c08.default-release

┌──(root㉿kali)-[/mnt/…/Mozilla/Firefox/Profiles/94mc0c08.default-release]
└─# ls
addons.json                          extension-store        security_state
addonStartup.json.lz4                favicons.sqlite        sessionCheckpoints.json
AlternateServices.bin                favicons.sqlite-shm    sessionstore-backups
bookmarkbackups                      favicons.sqlite-wal    sessionstore.jsonlz4
bounce-tracking-protection.sqlite    formhistory.sqlite     settings
broadcast-listeners.json             gmp-gmpopenh264        shield-preference-experiments.json
cert9.db                             gmp-widevinecdm        SiteSecurityServiceState.bin
compatibility.ini                    handlers.json          storage
containers.json                      key4.db                storage.sqlite
content-prefs.sqlite                 minidumps              suggest.sqlite
cookies.sqlite                       parent.lock            suggest.sqlite-shm
cookies.sqlite-shm                   permissions.sqlite     suggest.sqlite-wal
cookies.sqlite-wal                   pkcs11.txt             targeting.snapshot.json
crashes                              places.sqlite          times.json
datareporting                        places.sqlite-shm      webappsstore.sqlite
domain_to_categories.sqlite          places.sqlite-wal      webappsstore.sqlite-shm
domain_to_categories.sqlite-journal  prefs.js               webappsstore.sqlite-wal
ExperimentStoreData.json             protections.sqlite     xulstore.json
extension-preferences.json           saved-telemetry-pings
extensions.json                      search.json.mozlz4
```

Step 8: Accessing the Firefox places.sqlite database, which stores the user's browsing history and other activity.

Command: table to access visits counts, history, timestamps, and bookmark.

```
┌──(root㉿kali)-[/mnt/…/Mozilla/Firefox/Profiles/94mc0c08.default-release]
└─# cp -r places.sqlite /home/kali/Firefox_artifacts

┌──(root㉿kali)-[/mnt/…/Mozilla/Firefox/Profiles/94mc0c08.default-release]
└─# cd /home/kali/Firefox_artifacts

┌──(root㉿kali)-[/home/kali/Firefox_artifacts]
└─# sqlite3 places.sqlite
SQLite version 3.46.1 2024-08-13 09:16:08
Enter ".help" for usage hints.
sqlite> .tables
moz_anno_attributes                 moz_meta
moz_annos                           moz_newtab_story_click
moz_bookmarks                       moz_newtab_story_impression
moz_bookmarks_deleted               moz_origins
moz_historyvisits                   moz_places
moz_historyvisits_extra             moz_places_extra
moz_inputhistory                    moz_places_metadata
moz_items_annos                     moz_places_metadata_search_queries
moz_keywords                        moz_previews_tombstones
sqlite>
```

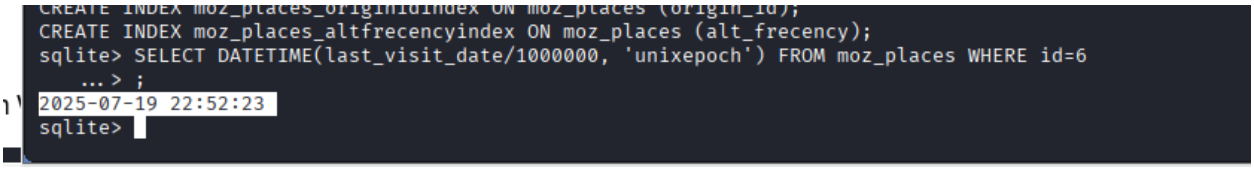
Step 9: Retrieve everything from the database.



The database contains a link to an executable

Step 10: Retrieve the timestamp for the last visit.

Command



Result: As shown in the screenshot, the browser appears to have last been used on 19th /07/2025 at 10:52 PM.

Status: worked

Findings:

The latest visit appears to have occurred on 19/07/2025 at 10:52 PM. Upon analyzing the URL's user interactions, a suspicious IP was found linking to an executable, which could potentially be malware or related to other malicious activity. This executable warrants a thorough investigation for possible compromise, unauthorized access, or misuse.

Conclusion

The presence of executable links and a suspicious IP address indicates potentially malicious activity. The web browser was last accessed on 19th July 2025 at 10:52 PM. Further analysis of downloads, cookies, and the WebAppStore SQLite database is recommended, along with scanning system logs for potential threats.