THM__Windows Forensics 1 [Introduction to Windows Registry Forensics]

https://tryhackme.com/room/windowsforensics1

Task 1 Introduction to Windows Forensics

TLDR: Mostly a summary of how digital forensics has been used, defining what an "artifact" is, and how Windows keeps tabs on users to provide a more personalized experience.

Answer the questions below

What is the most used Desktop Operating System right now?

Microsoft Windows

What is the term used to define a piece of evidence of human activity?

Artifact

Task 2 Windows Registry and Forensics

TLDR: Windows registry contains config data; consist of keys and values; a **registry hive** is a group of keys, subkeys and values stored in a single file

regedit.exe

The registry on any Windows system contains the following five root keys:

1. HKEY_CURRENT_USER
2. HKEY_HKEY_USERS
3. HKEY_LOCAL_MACHINE
4. HKEY_CLASSES_ROOT--this information is stored under both the HKEY_LOCAL_MACHINE and HKEY_CURRENT_USER keys
5. HKEY_CURRENT_CONFIG

Hives (OFFLINE)
Now, if you are accessing a live system, you will be able to access the registry using regedit.exe, and you will be greeted with all of these standard root keys. However, if you only have access to a disk image, you must know where the registry hives are located on the disk. The majority of these hives are located in the C:\Windows\System32\Config directory and are:

1. **DEFAULT** (mounted on HKEY_USERS\DEFAULT)
2. **SAM** (mounted on HKEY_LOCAL_MACHINE\SAM)
3. **SECURITY** (mounted on HKEY_LOCAL_MACHINE\Security)
4. **SOFTWARE** (mounted on HKEY_LOCAL_MACHINE\Software)
5. **SYSTEM** (mounted on HKEY_LOCAL_MACHINE\System)

Apart from these hives, two other hives containing user information can be found in the User profile directory. For Windows 7 and above, a user's profile directory is located in C:\Users\<username>\ where the hives are:

1. **NTUSER.DAT** (mounted on HKEY_CURRENT_USER when a user logs in)
2. **USRCLASS.DAT** (mounted on HKEY_CURRENT_USER\Software\CLASSES)

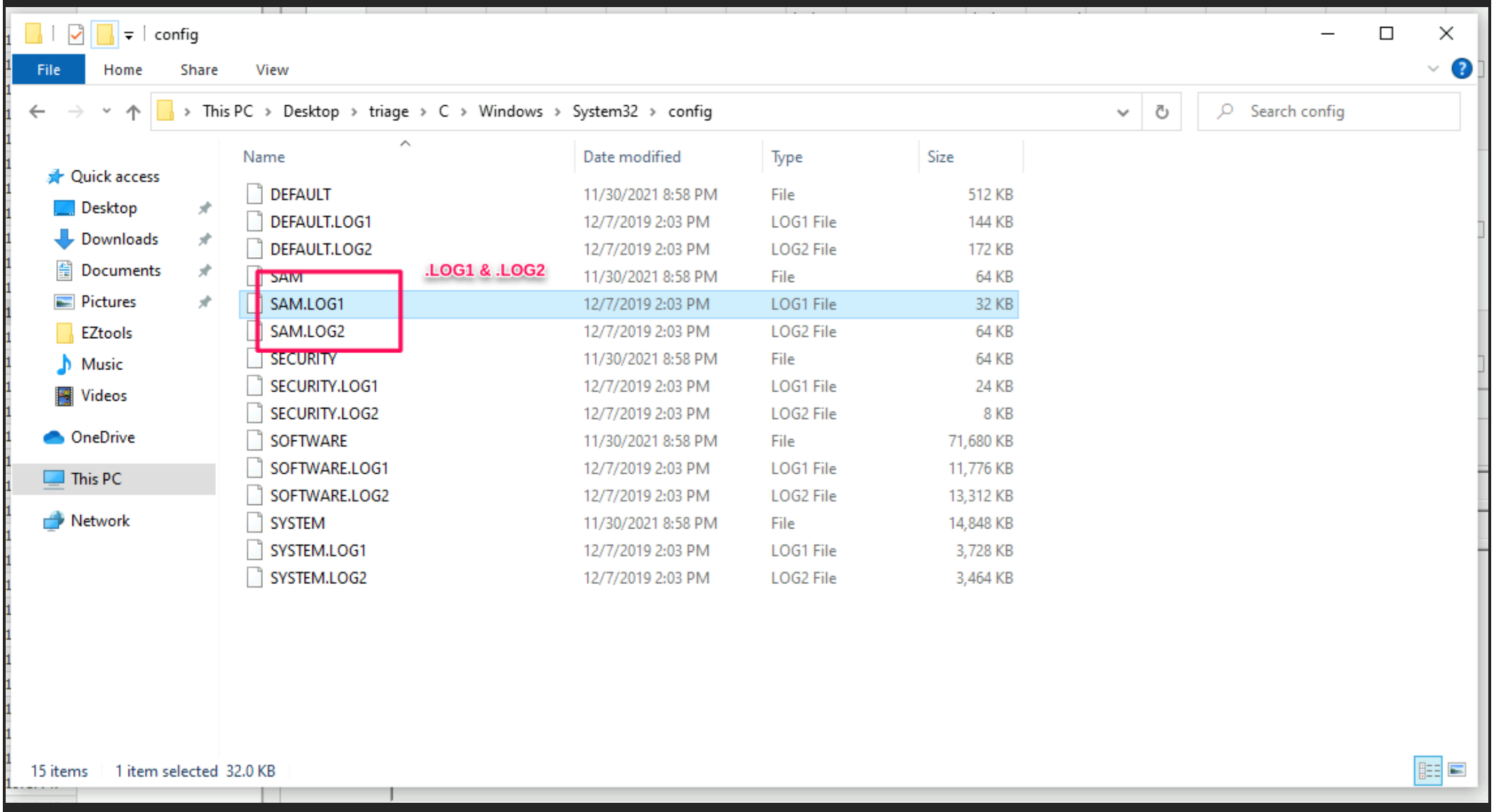
The USRCLASS.DAT hive is located in the directory C:\Users\<username>\AppData\Local\Microsoft\Windows.
The NTUSER.DAT hive is located in the directory C:\Users\<username>\.
Remember that NTUSER.DAT and USRCLASS.DAT are hidden files.

The Amcache Hive:

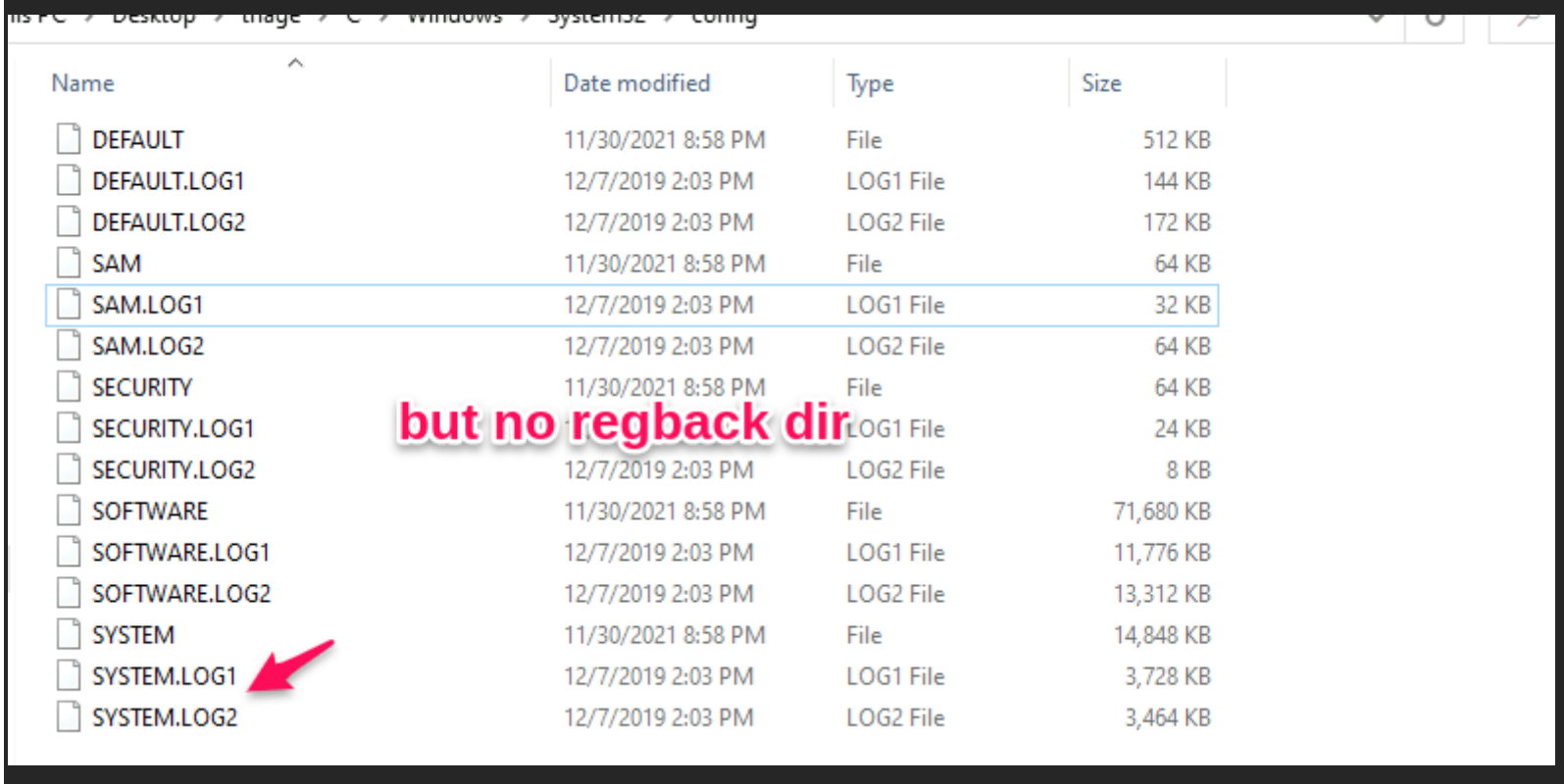
Apart from these files, there is another very important hive called the AmCache hive. This hive is located in C:\Windows\AppCompat\Programs\Amcache.hve. Windows creates this hive to save information on programs that were recently run on the system.

Transaction Logs and Backups:

Some other very vital sources of forensic data are the registry transaction logs and backups. The transaction logs can be considered as the journal of the changelog of the registry hive. Windows often uses transaction logs when writing data to registry hives. This means that the transaction logs can often have the latest changes in the registry that haven't made their way to the registry hives themselves. The transaction log for each hive is stored as a .LOG file in the same directory as the hive itself. It has the same name as the registry hive, but the extension is .LOG. For example, the transaction log for the SAM hive will be located in C:\Windows\System32\Config in the filename SAM.LOG. Sometimes there can be multiple transaction logs as well. In that case, they will have .LOG1, .LOG2 etc., as their extension. It is prudent to look at the transaction logs as well when performing registry forensics.



Registry backups are the opposite of Transaction logs. These are the backups of the registry hives located in the C:\Windows\System32\Config directory. These hives are copied to the C:\Windows\System32\Config\RegBack directory every ten days. It might be an excellent place to look if you suspect that some registry keys might have been deleted/modified recently.



Answer the questions below

What is the short form for HKEY_LOCAL_MACHINE?

HKLM

What is the path for the five main registry hives, DEFAULT, SAM, SECURITY, SOFTWARE, and SYSTEM?

C:\Windows\System32\Config

What is the path for the AmCache hive?

C:\Windows\AppCompat\Programs\Amcache.hve

Task 3 Exploring Windows Registry

Data Acquisition:

Though we can view the registry through the registry editor, the forensically correct method is to acquire a copy of this data and perform analysis on that. However, when we go to copy the registry hives from %WINDIR%\System32\Config, we cannot because it is a restricted file. So, what to do now?

For acquiring these files, we can use one of the following tools:

KAPE:
https://www.kroll.com/en/services/cyber-risk/incident-response-litigation-support/kroll-artifact-parser-extractor-kape/training

KAPE is a live data acquisition and analysis tool which can be used to acquire registry data. It is primarily a command-line tool but also comes with a GUI. The below screenshot shows what the KAPE GUI looks like. We have already selected all the settings to extract the registry data using KAPE in this screenshot.

Tried to download for free, link in email did not work. I'll look into this later.

Autopsy:
Autopsy gives you the option to acquire data from both live systems or from a disk image. After adding your data source, navigate to the location of the files you want to extract, then right-click and select the Extract File(s) option. It will look similar to what you see in the screenshot below.

Honestly, there are too many hoops to install autopsy on Linux
Used this to install it

```
sudo dpkg -i --force-overwrite [filename]
```

Then run:

```
sudo apt -f install
```

to fix if any broken packages.

FTK Imager:

FTK Imager is similar to Autopsy and allows you to extract files from a disk image or a live system by mounting the said disk image or drive in FTK Imager. Below you can see the option to Export files as highlighted in the screenshot.

Windows only, it seems!

Another way you can extract Registry files from FTK Imager is through the Obtain Protected Files option. This option is only available for live systems and is highlighted in the screenshot below. This option allows you to extract all the registry hives to a location of your choosing. However, it will not copy the Amcache.hve file, which is often necessary to investigate evidence of programs that were last executed.

Exploring the extracted files:

Once we have extracted the registry hives, we need a tool to view these files as we would in the registry editor. Since the registry editor only works with live systems and can't load exported hives, we can use the following tools:

Registry Viewer:

As we can see in the screenshot below, AccessData's Registry Viewer has a similar user interface to the Windows Registry Editor. There are a couple of limitations, though. It only loads one hive at a time, and it can't take the transaction logs into account.

Zimmerman's Registry Explorer:

Get-ZimmermanTools.zip 15 kB

Eric Zimmerman has developed a handful of tools that are very useful for performing Digital Forensics and Incident Response. One of them is the Registry Explorer. It looks like the below screenshot. It can load multiple hives simultaneously and add data from transaction logs into the hive to make a more 'cleaner' hive with more up-to-date data. It also has a handy 'Bookmarks' option containing forensically important registry keys often sought by forensics investigators. Investigators can go straight to the interesting registry keys and values with the bookmarks menu item. We will explore these in more detail in the upcoming tasks.

RegRipper:

RegRipper is a utility that takes a registry hive as input and outputs a report that extracts data from some of the forensically important keys and values in that hive. The output report is in a text file and shows all the results in sequential order.

RegRipper is available in both a CLI and GUI form which is shown in the screenshot below.

One shortcoming of RegRipper is that it does not take the transaction logs into account. We must use Registry Explorer to merge transaction logs with the respective registry hives before sending the output to RegRipper for a more accurate result.

Even though we have discussed these different tools, for the purpose of this room, we will only be using Registry Explorer and some of Eric Zimmerman's tools. The other tools mentioned here will be covered in separate rooms.

NO QUESTIONS

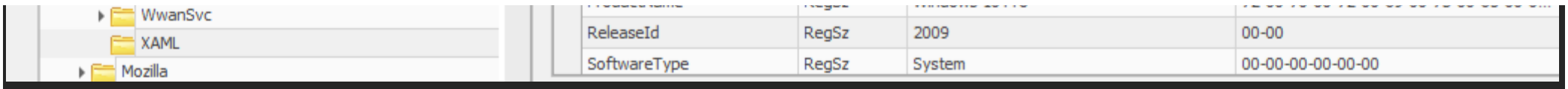
Task 4 System Information and System Accounts

Step 1: gather system information and account info

To find the OS version, we can use the following registry key:

SOFTWARE\Microsoft\Windows NT\CurrentVersion

This is how Registry Explorer shows this registry key. Take a look and answer Question # 1.



Current control set:

The hives containing the machine's configuration data used for controlling system startup are called Control Sets. Commonly, we will see two Control Sets, ControlSet001 and ControlSet002, in the SYSTEM hive on a machine. In most cases, ControlSet001 will point to the Control Set that the machine booted with, and ControlSet002 will be the last known good configuration. Their locations will be:

SYSTEM\ControlSet001

SYSTEM\ControlSet002

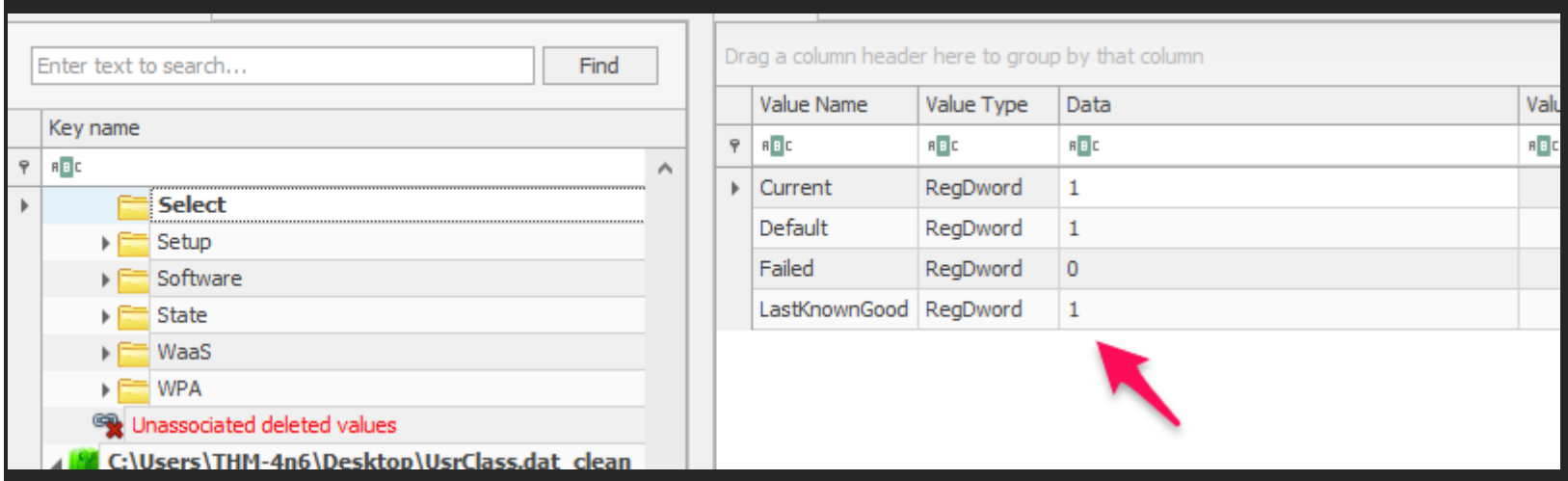
Windows creates a volatile Control Set when the machine is live, called the CurrentControlSet (HKLM\SYSTEM\CurrentControlSet). For getting the most accurate system information, this is the hive that we will refer to. We can find out which Control Set is being used as the CurrentControlSet by looking at the following registry value:

SYSTEM\Select\Current

Similarly, the last known good configuration can be found using the following registry value:

SYSTEM\Select\LastKnownGood

This is how it looks like in Registry Explorer. Take a look and answer Question # 2.



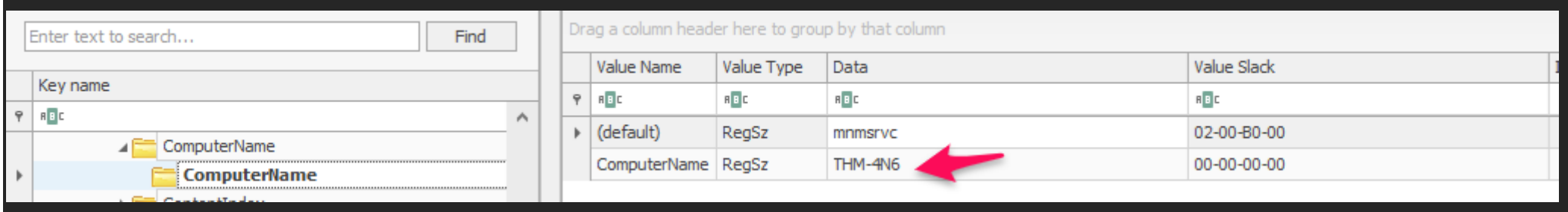
It is vital to establish this information before moving forward with the analysis. As we will see, many forensic artifacts we collect will be collected from the Control Sets.

Computer Name:

It is crucial to establish the Computer Name while performing forensic analysis to ensure that we are working on the machine we are supposed to work on. We can find the Computer Name from the following location:

SYSTEM\CurrentControlSet\Control\ComputerName\ComputerName

Registry Explorer shows it like this. Take a look and answer Question # 3:

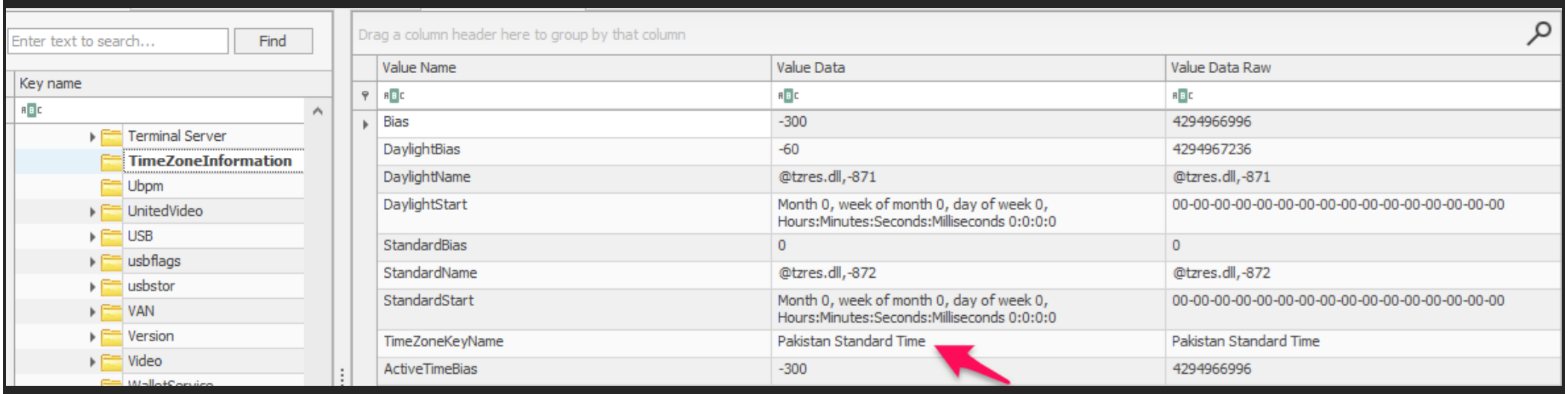


Time Zone Information:

For accuracy, it is important to establish what time zone the computer is located in. This will help us understand the chronology of the events as they happened. For finding the Time Zone Information, we can look at the following location:

SYSTEM\CurrentControlSet\Control\TimeZoneInformation

Here's how it looks in Registry Explorer. Take a look and answer Question # 4.



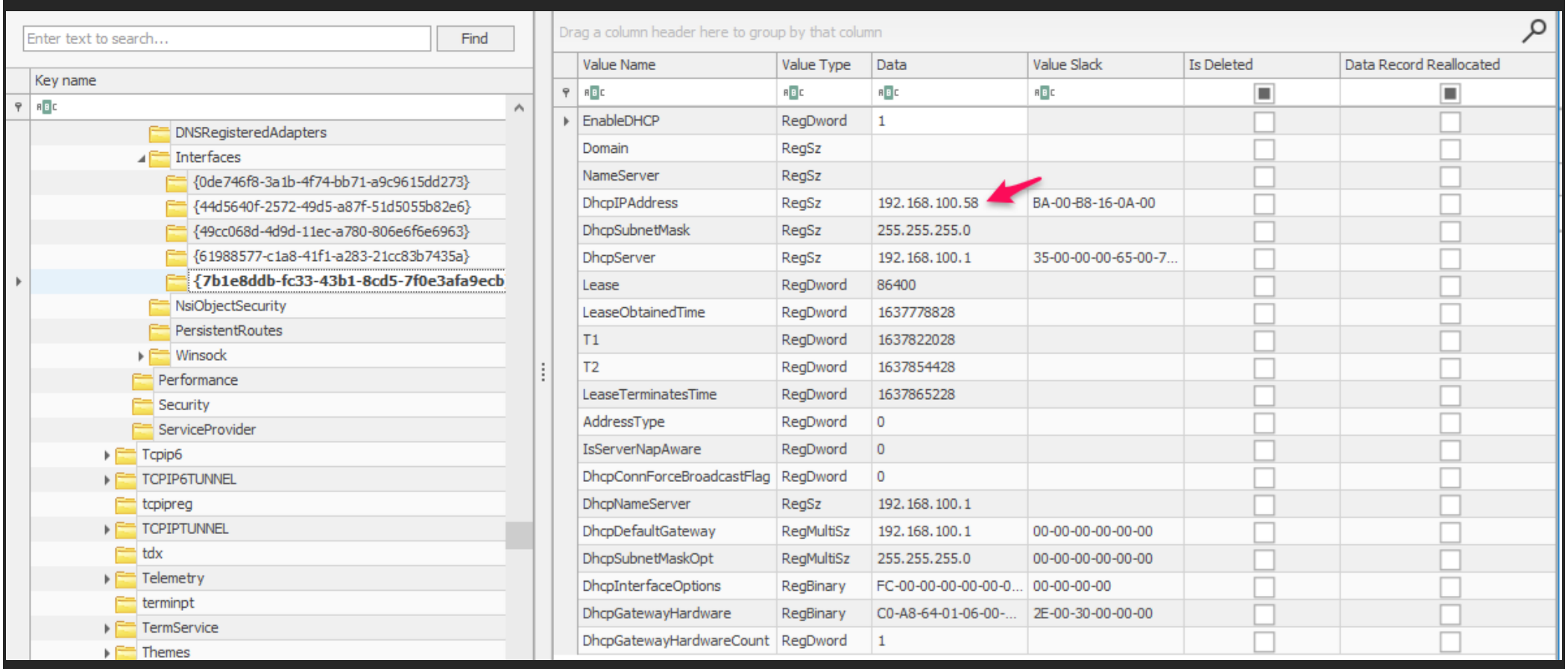
Time Zone Information is important because some data in the computer will have their timestamps in UTC/GMT and others in the local time zone. Knowledge of the local time zone helps in establishing a timeline when merging data from all the sources.

Network Interfaces and Past Networks:

The following registry key will give a list of network interfaces on the machine we are investigating:

SYSTEM\CurrentControlSet\Services\Tcpip\Parameters\Interfaces

Take a look at this registry key as shown in Registry Explorer and answer Question # 5.

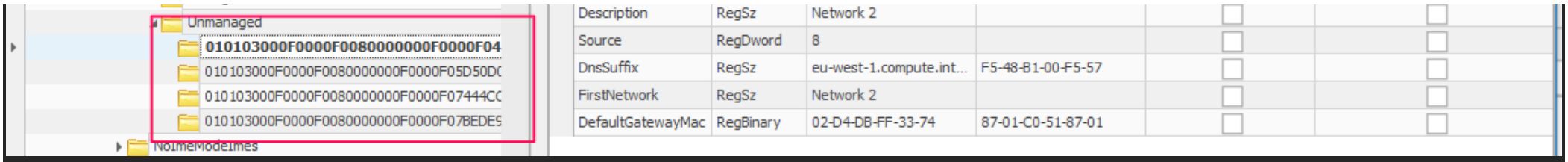


Each Interface is represented with a unique identifier (GUID) subkey, which contains values relating to the interface's TCP/IP configuration. This key will provide us with information like IP addresses, DHCP IP address and Subnet Mask, DNS Servers, and more. **This information is significant because it helps you make sure that you are performing forensics on the machine that you are supposed to perform it on.**

The past networks a given machine was connected to can be found in the following locations:

SOFTWARE\Microsoft\Windows NT\CurrentVersion\NetworkList\Signatures\Unmanaged

SOFTWARE\Microsoft\Windows NT\CurrentVersion\NetworkList\Signatures\Managed



These registry keys contain past networks as well as the last time they were connected. The last write time of the registry key points to the last time these networks were connected.

Autostart Programs (Autoruns):

The following registry keys include information about programs or commands that run when a user logs on.

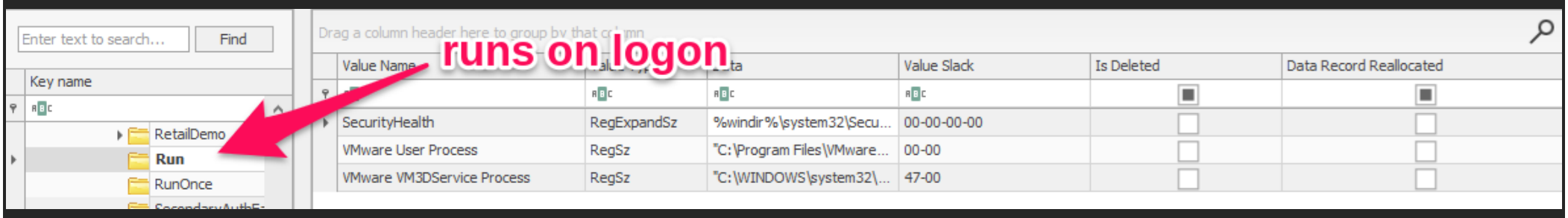
NTUSER.DAT\Software\Microsoft\Windows\CurrentVersion\Run

NTUSER.DAT\Software\Microsoft\Windows\CurrentVersion\RunOnce

SOFTWARE\Microsoft\Windows\CurrentVersion\RunOnce

SOFTWARE\Microsoft\Windows\CurrentVersion\policies\Explorer\Run

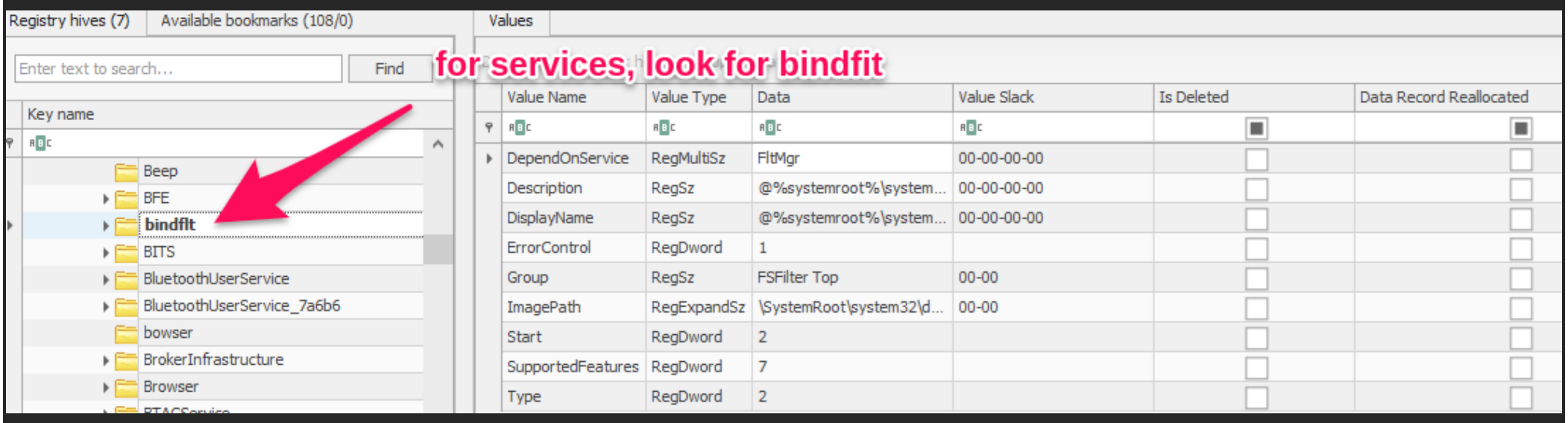
SOFTWARE\Microsoft\Windows\CurrentVersion\Run



The following registry key contains information about services:

SYSTEM\CurrentControlSet\Services

Notice the Value of the Start key in the screenshot below.



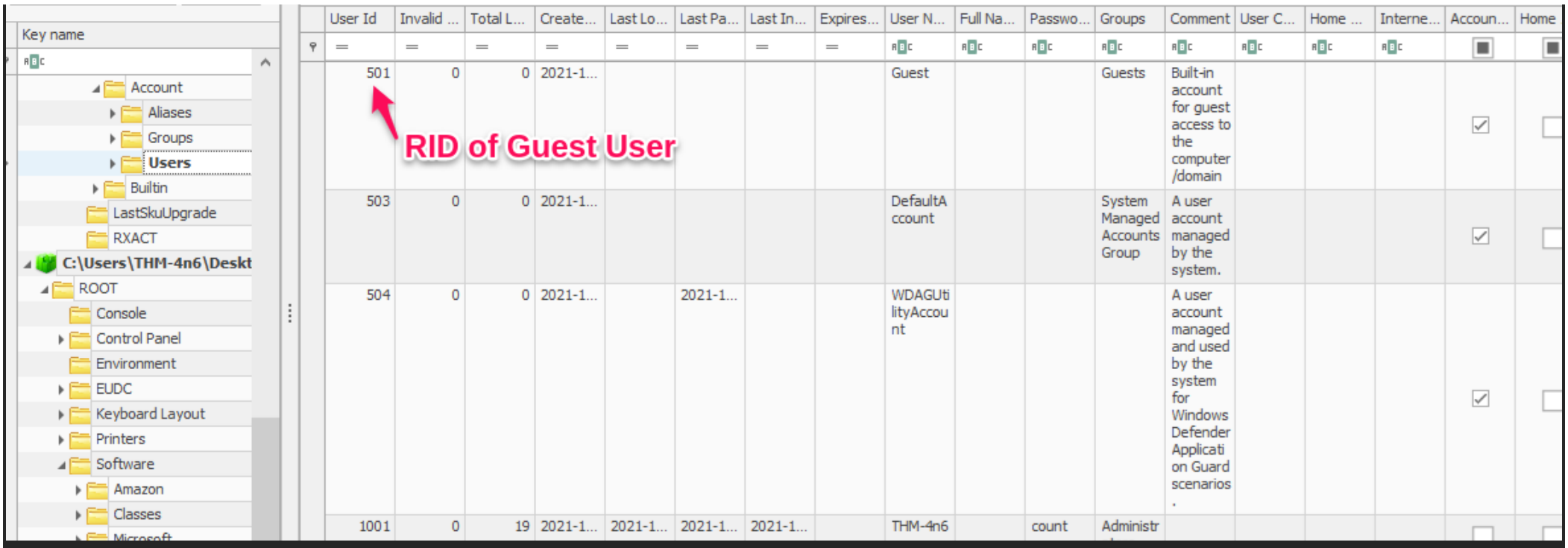
In this registry key, if the start key is set to 0x02, this means that this service will start at boot.

SAM hive and user information:

The SAM hive contains user account information, login information, and group information. This information is mainly located in the following location:

SAM\Domains\Account\Users

Take a look at the below screenshot and answer Question # 6.



The information contained here includes the relative identifier (RID) of the user, number of times the user logged in, last login time, last failed login, last password change, password expiry, password policy and password hint, and any groups that the user is a part of.

Answer the questions below

What is the Current Build Number of the machine whose data is being investigated?

19044

Which ControlSet contains the last known good configuration?

1

What is the Computer Name of the computer?

THM-4N6

What is the value of the TimeZoneKeyName?

Pakistan Standard Time

What is the DHCP IP address

192.168.100.58

What is the RID of the Guest User account?

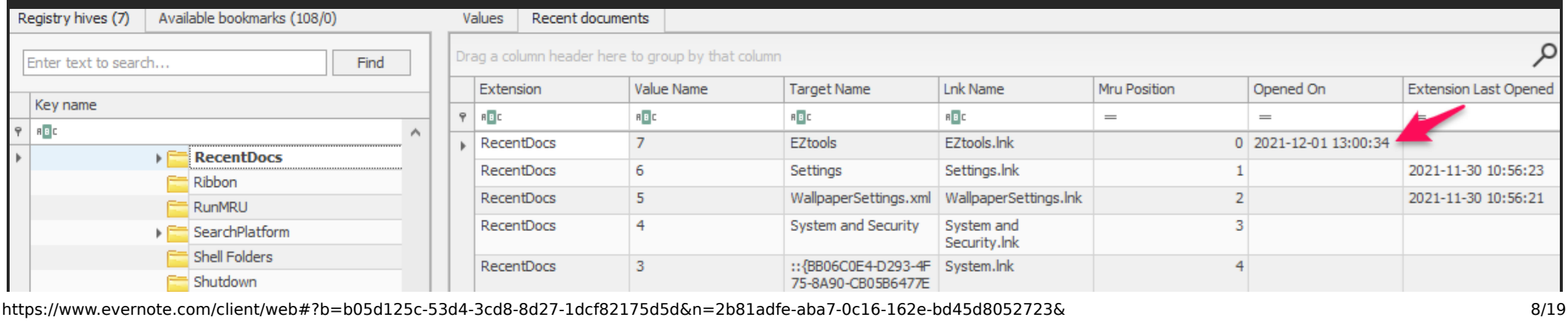
501

Task 5 Usage or knowledge of files/folders

Recent Files:

Windows maintains a list of recently opened files for each user. As we might have seen when using Windows Explorer, it shows us a list of recently used files. This information is stored in the NTUSER hive and can be found on the following location:

NTUSER.DAT\Software\Microsoft\Windows\CurrentVersion\Explorer\RecentDocs



		EE}				
RecentDocs	1	KAPE	KAPE.lnk	5		
RecentDocs	0	Get-KAPEUpdate.ps1	Get-KAPEUpdate.lnk	6		2021-11-24 18:18:48
RecentDocs	2	ChangeLog.txt	ChangeLog.lnk	7		2021-11-24 18:18:48
Folder	2	Settings	Settings.lnk	0	2021-11-30 10:56:23	
Folder	1	System and Security	System and Security.lnk	1		
Folder	0	KAPE	KAPE.lnk	2		
.xml	0	WallpaperSettings.xml	WallpaperSettings.lnk	0	2021-11-30 10:56:21	
.txt	0	ChangeLog.txt	ChangeLog.lnk	0	2021-11-24 18:18:48	
.ps1	0	Get-KAPEUpdate.ps1	Get-KAPEUpdate.lnk	0	2021-11-24 18:18:48	

Registry Explorer allows us to sort data contained in registry keys quickly. For example, the Recent documents tab arranges the Most Recently Used (MRU) file at the top of the list. Registry Explorer also arranges them so that the Most Recently Used (MRU) file is shown at the top of the list and the older ones later.

Another interesting piece of information in this registry key is that there are different keys with file extensions, such as .pdf, .jpg, .docx etc. These keys provide us with information about the last used files of a specific file extension. So if we are looking specifically for the last used PDF files, we can look at the following registry key:

NTUSER.DAT\Software\Microsoft\Windows\CurrentVersion\Explorer\RecentDocs\.pdf

Registry Explorer also lists the Last Opened time of the files. Answer Question # 1 by looking at the above screenshot.

Office Recent Files:

Similar to the Recent Docs maintained by Windows Explorer, Microsoft Office also maintains a list of recently opened documents. This list is also located in the NTUSER hive. It can be found in the following location:

NTUSER.DAT\Software\Microsoft\Office\VERSION

The version number for each Microsoft Office release is different. An example registry key will look like this:

NTUSER.DAT\Software\Microsoft\Office\15.0\Word

Here, the 15.0 refers to Office 2013. A list of different Office releases and their version numbers can be found on this link.

Starting from Office 365, Microsoft now ties the location to the user's live ID. In such a scenario, the recent files can be found at the following location.

NTUSER.DAT\Software\Microsoft\Office\VERSION\UserMRU\LiveID_####\FileMRU

In such a scenario, the recent files can be found at the following location. This location also saves the complete path of the most recently used files.

ShellBags:

When any user opens a folder, it opens in a specific layout. Users can change this layout according to their preferences. These layouts can be different for different folders. This information about the Windows *'shell'* is stored and can identify the Most Recently Used files and folders. Since this setting is different for each user, it is located in the user hives. We can find this information on the following locations:

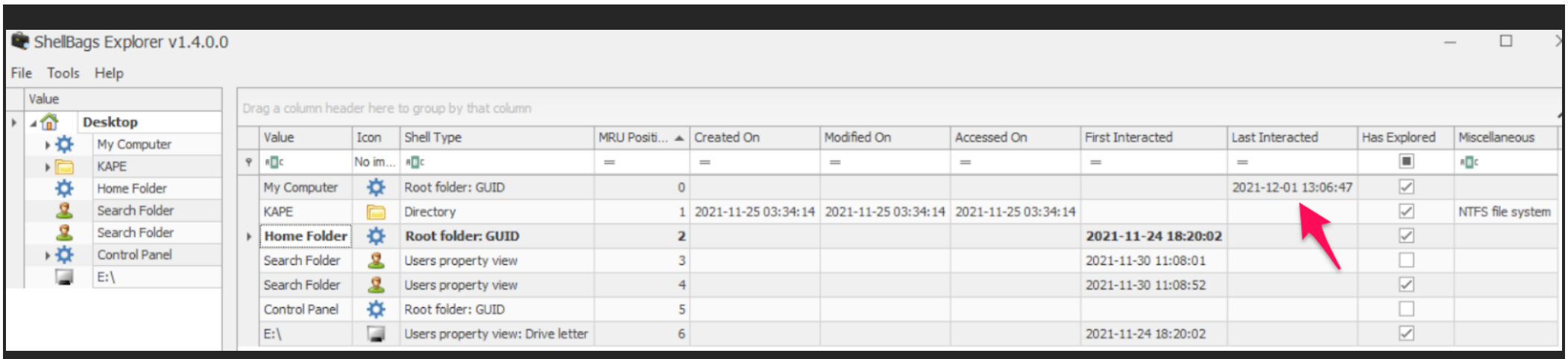
USRCLASS.DAT\Local Settings\Software\Microsoft\Windows\Shell\Bags

USRCLASS.DAT\Local Settings\Software\Microsoft\Windows\Shell\BagMRU

NTUSER.DAT\Software\Microsoft\Windows\Shell\BagMRU

NTUSER.DAT\Software\Microsoft\Windows\Shell\Bags

Registry Explorer doesn't give us much information about ShellBags. However, another tool from **Eric Zimmerman's tools called the ShellBag Explorer** shows us the information in an easy-to-use format. We just have to point to the hive file we have extracted, and it parses the data and shows us the results. An example is shown below. Take a look and answer Question # 2.



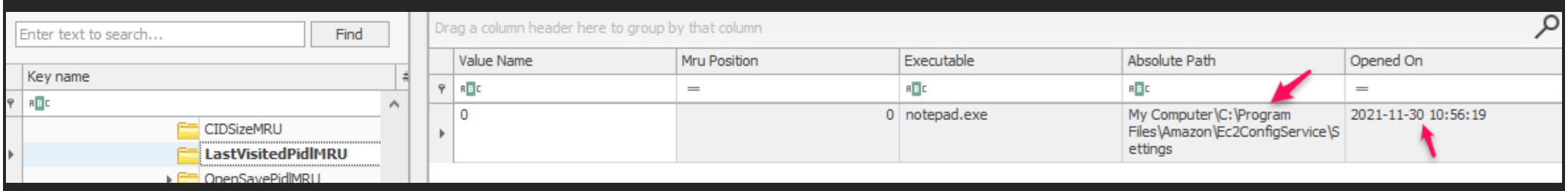
Open/Save and LastVisited Dialog MRUs:

When we open or save a file, a dialog box appears asking us where to save or open that file from. It might be noticed that once we open/save a file at a specific location, Windows remembers that location. This implies that we can find out recently used files if we get our hands on this information. We can do so by examining the following registry keys

NTUSER.DAT\Software\Microsoft\Windows\CurrentVersion\Explorer\ComDlg32\OpenSavePIDlMRU

NTUSER.DAT\Software\Microsoft\Windows\CurrentVersion\Explorer\ComDlg32\LastVisitedPidlMRU

This is how Registry Explorer shows this registry key. Take a look to answer Question # 3 and 4.



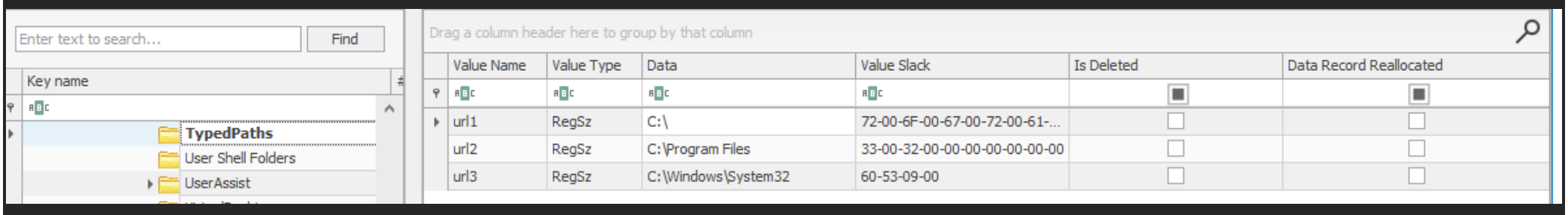
Windows Explorer Address/Search Bars:

Another way to identify a user's recent activity is by looking at the paths typed in the Windows Explorer address bar or searches performed using the following registry keys, respectively.

NTUSER.DAT\Software\Microsoft\Windows\CurrentVersion\Explorer\TypedPaths

NTUSER.DAT\Software\Microsoft\Windows\CurrentVersion\Explorer\WordWheelQuery

Here is how the TypedPaths key looks like in Registry Explorer:



Answer the questions below

When was EZtools opened?

2021-12-01 13:00:34

At what time was My Computer last interacted with?

2021-12-01 13:06:47

What is the Absolute Path of the file opened using notepad.exe?

C:\Program Files\Amazon\Ec2ConfigService\Settings

When was this file opened?

2021-11-30 10:56:19

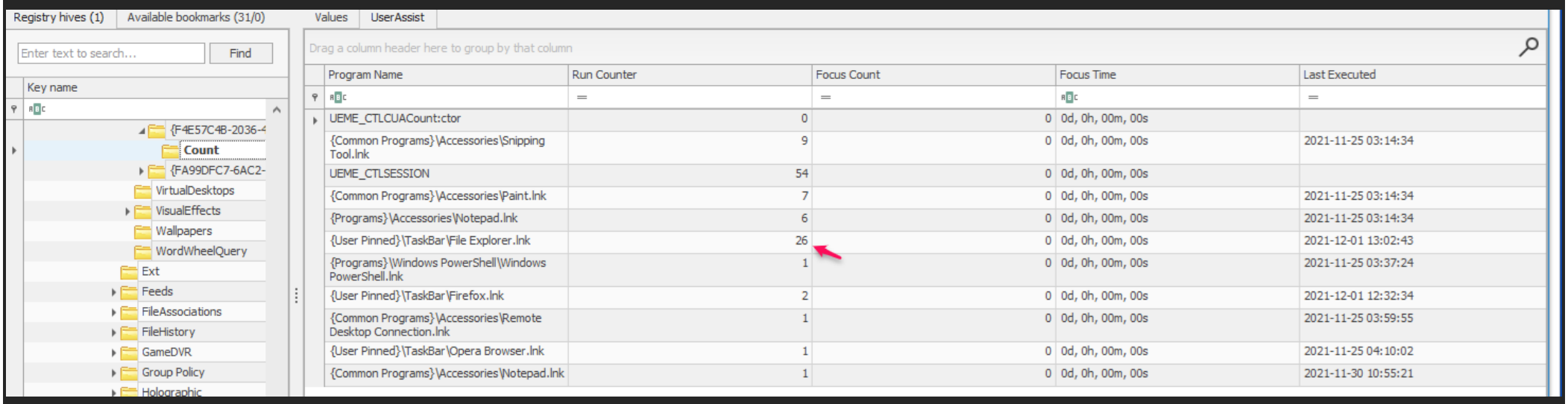
Task 6 Evidence of Execution

UserAssist:

Windows keeps track of applications launched by the user using Windows Explorer for statistical purposes in the User Assist registry keys. These keys contain information about the programs launched, the time of their launch, and the number of times they were executed. However, **programs that were run using the command line can't be found in the User Assist keys.** The User Assist key is present in the NTUSER hive, mapped to each user's GUID. We can find it at the following location:

NTUSER.DAT\Software\Microsoft\Windows\Currentversion\Explorer\UserAssist\{GUID}\Count

Take a look at the below screenshot from Registry Explorer and answer Question #1.



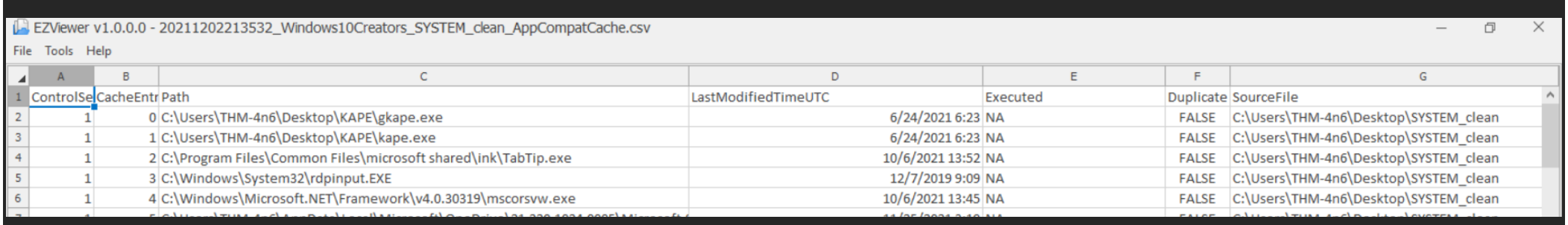
ShimCache:

ShimCache is a mechanism used to keep track of application compatibility with the OS and tracks all applications launched on the machine. **Its main purpose in Windows is to ensure backward compatibility of applications.** It is also called Application Compatibility Cache (AppCompatCache). It is located in the following location in the SYSTEM hive:

SYSTEM\CurrentControlSet\Control\Session Manager\AppCompatCache

ShimCache stores file name, file size, and last modified time of the executables.

Our goto tool, the Registry Explorer, doesn't parse ShimCache data in a human-readable format, so we go to another tool called **AppCompatCache Parser, also a part of Eric Zimmerman's tools.** It takes the SYSTEM hive as input, parses the data, and outputs a CSV file that looks like this:



We can use the following command to run the AppCompatCache Parser Utility:

AppCompatCacheParser.exe --csv <path to save output> -f <path to SYSTEM hive for data parsing> -c <control set to parse>

The output can be viewed using **EZviewer**, another one of Eric Zimmerman's tools.

AmCache:

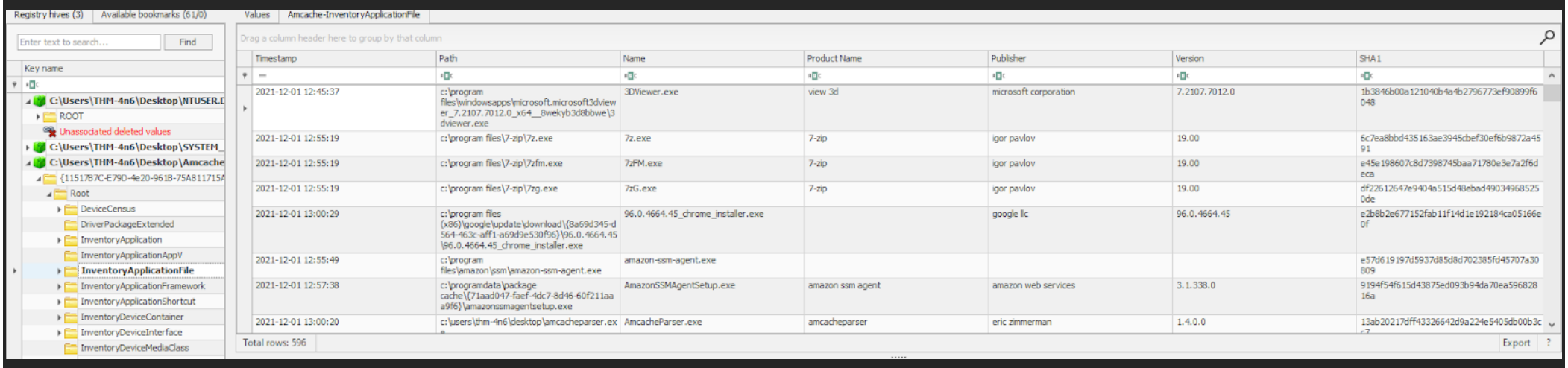
The AmCache hive is an artifact related to ShimCache. This performs a similar function to ShimCache, and stores additional data related to program executions. This data includes execution path, installation, execution and deletion times, and SHA1 hashes of the executed programs. This hive is located in the file system at:

C:\Windows\appcompat\Programs\Amcache.hve

Information about the last executed programs can be found at the following location in the hive:

Amcache.hve\Root\File\{Volume GUID}\

This is how Registry Explorer parses the AmCache hive:



BAM/DAM:

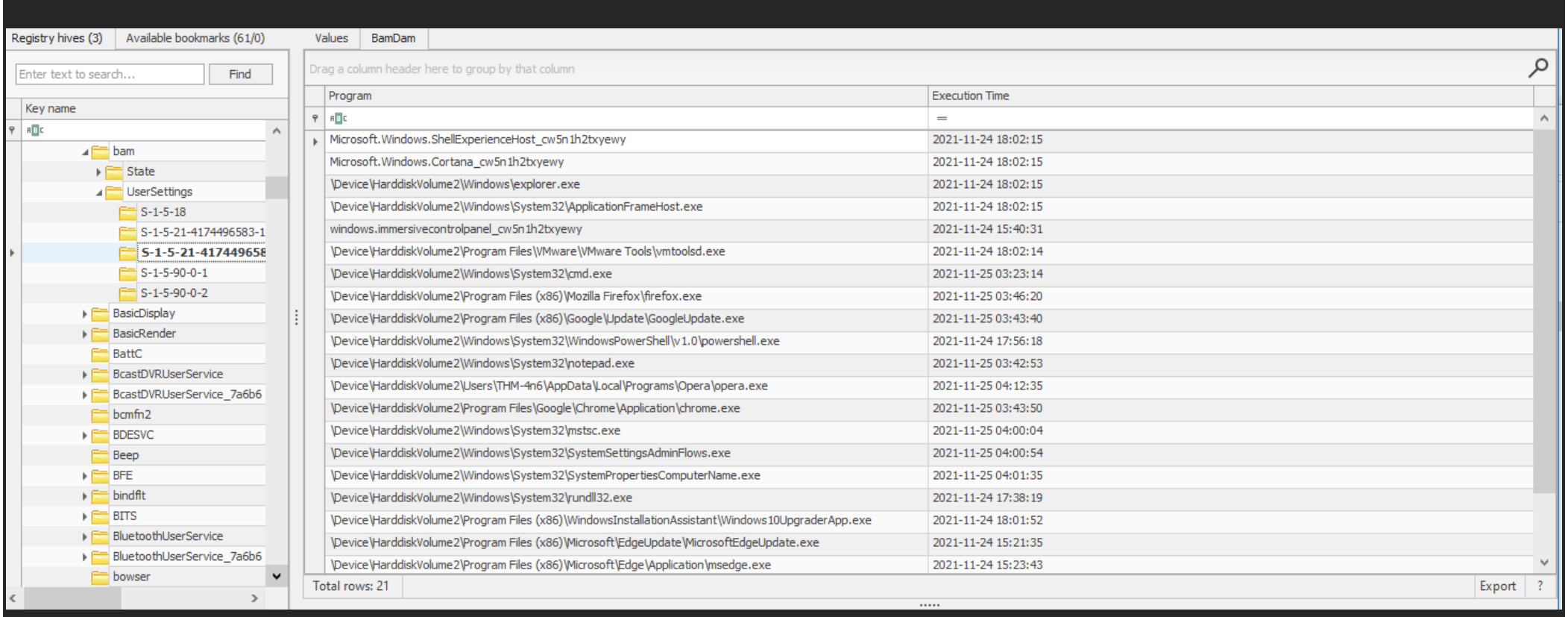
Background Activity Monitor or BAM keeps a tab on the activity of background applications. Similar Desktop Activity Moderator or DAM is a part of Microsoft Windows that optimizes the power consumption of the device. Both of these are a part of the Modern Standby system in Microsoft Windows.

In the Windows registry, the following locations contain information related to BAM and DAM. This location contains information about last run programs, their full paths, and last execution time.

SYSTEM\CurrentControlSet\Services\bam\UserSettings\{SID}

SYSTEM\CurrentControlSet\Services\dam\UserSettings\{SID}

Below you can see how Registry Explorer parses data from BAM:



Answer the questions below

How many times was the File Explorer launched?

26

What is another name for ShimCache?

AppCompatCache

Which of the artifacts also saves SHA1 hashes of the executed programs?

AmCache

Which of the artifacts saves the full path of the executed programs?

BAM/DAM

Task 7 External Devices/USB device forensics

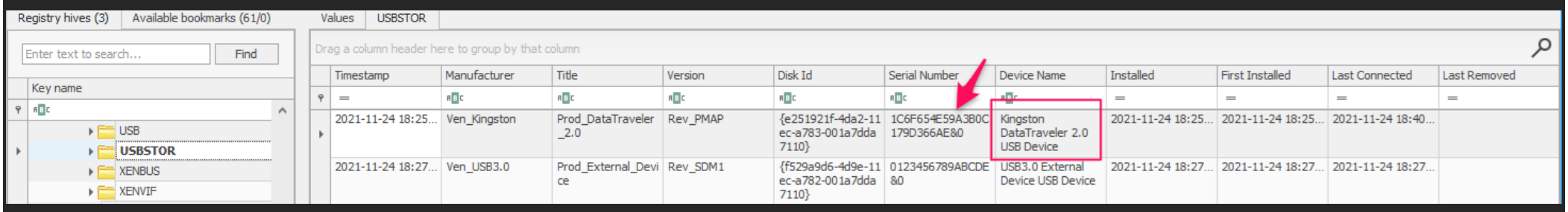
Device identification:

The following locations keep track of USB keys plugged into a system. These locations store the vendor id, product id, and version of the USB device plugged in and can be used to identify unique devices. These locations also store the time the devices were plugged into the system.

SYSTEM\CurrentControlSet\Enum\USBSTOR

SYSTEM\CurrentControlSet\Enum\USB

Registry Explorer shows this information in a nice and easy-to-understand way. Take a look at this and answer Questions # 1 and 2.



First/Last Times:

Similarly, the following registry key tracks the first time the device was connected, the last time it was connected and the last time the device was removed from the system.

SYSTEM\CurrentControlSet\Enum\USBSTOR\Ven_Prod_Version\USBSerial#\Properties\{83da6326-97a6-4088-9453-a19231573b29}\####

In this key, the #### sign can be replaced by the following digits to get the required information:

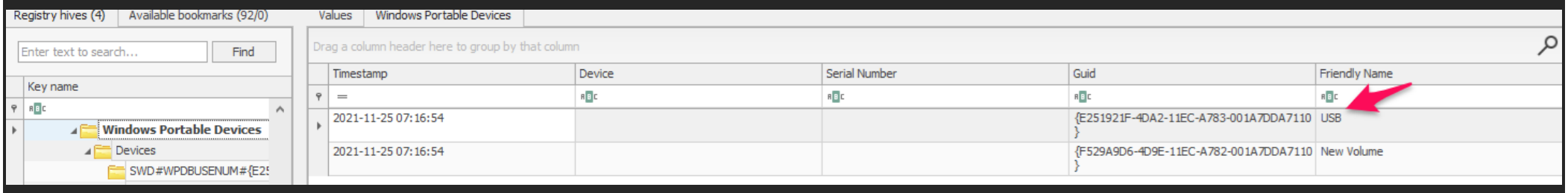
Value	Information
0064	First Connection time
0066	Last Connection time
0067	Last removal time

Although we can check this value manually, as we have seen above, Registry Explorer already parses this data and shows us if we select the USBSTOR key.

USB device Volume Name:

The device name of the connected drive can be found at the following location:

SOFTWARE\Microsoft\Windows Portable Devices\Devices



We can compare the GUID we see here in this registry key and compare it with the Disk ID we see on keys mentioned in device identification to correlate the names with unique devices. Take a look at these two screenshots and answer Question # 3.

Combining all of this information, we can create a fair picture of any USB devices that were connected to the machine we're investigating.

Answer the questions below

What is the serial number of the device from the manufacturer 'Kingston'?

1C6F654E59A3B0C179D366AE&0

What is the name of this device?

Kingston DataTraveler 2.0 USB Device

What is the friendly name of the device from the manufacturer 'Kingston'?

USB

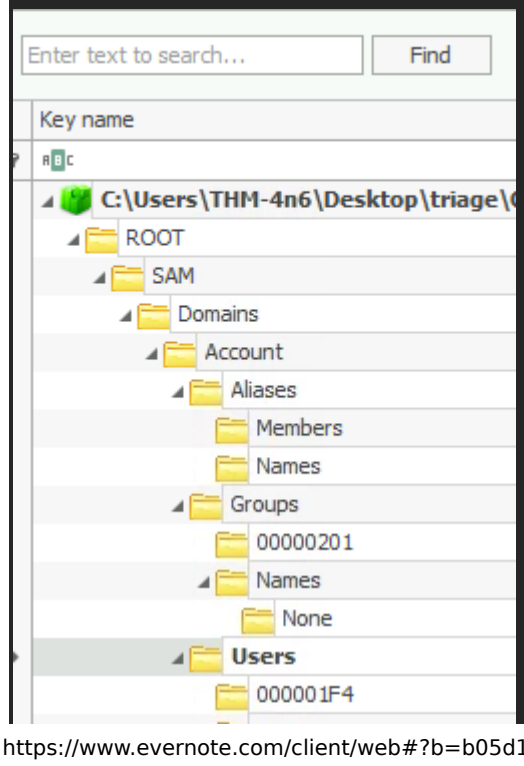
Task 8 Hands-on Challenge

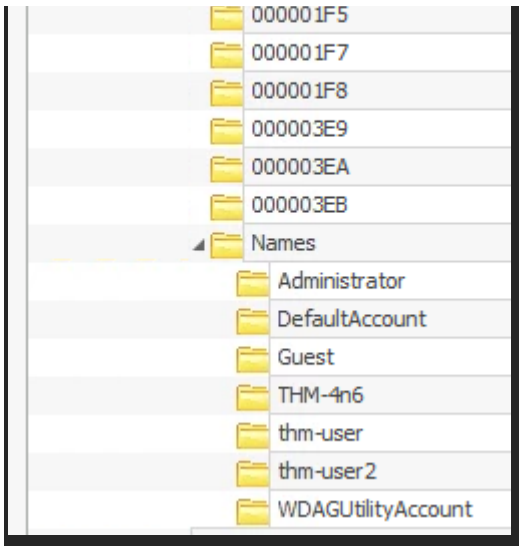
Answer the questions below

How many user created accounts are present on the system?

Hint: Check the SAM hive. Accounts with RIDs starting with 10xx are user created accounts

Here I opened RegistryExplorer and opened up the SAM hive, C:\Windows\System32\Config \SAM





In the details I find

User Id	Invalid L...	Total Lo...	Created...	Last Log...	Last Pas...	Last Inc...	Expires ...	User Na...	Full Name	Passwor...	Groups	Comment	User C
503	0	0	2021-11...					DefaultAccount			System Managed Accounts Group	A user account managed by the system.	
504	0	0	2021-11...		2021-11...			WDAGUtilityAccount				A user account managed and used by the system for Windows Defender Application Guard scenarios.	
1001	0	19	2021-11...	2021-12...	2021-11...	2021-11...		THM-4n6		count	Administrators		
1002	0	2	2021-11...	2021-11...				thm-user		null	Users		
1003	0	0	2021-11...					thm-user2		null	Users		

otal rows: 7

What is the username of the account that has never been logged in?

Hint: Check the account that does not have a last logged in time

User Id	Invalid L...	Total Lo...	Created...	Last Log...	Last Pas...	Last Inc...	Expires ...	User Na...	Full Name	Passwor...	Groups	Comment	User C
503	0	0	2021-11...					DefaultAccount			System Managed Accounts Group	A user account managed by the system.	
504	0	0	2021-11...		2021-11...			WDAGUtilityAccount				A user account managed and used by the system for Windows Defender Application Guard scenarios.	
1001	0	19	2021-11...	2021-12...	2021-11...	2021-11...		THM-4n6		count	Administrators		
1002	0	2	2021-11...	2021-11...				thm-user		null	Users		
1003	0	0	2021-11...					thm-user2		null	Users		

otal rows: 7

What's the password hint for the user THM-4n6?

Hint: Check the Password Hint column

...	User Na...	Full Name	Passw...	Groups	Com
	DefaultAccount			System Managed Accounts Group	A us acc man by t syst
	WDAGUtilityAccount				A us acc man and by t syst for Win Defa App

	THM-4n6	count	Administrators	
	thm-user	null	Users	
	thm-user2	null	Users	

When was the file 'Changelog.txt' accessed?

Hint: Format: yyyy-mm-dd hh:mm:ss Check in evidence of file/folder opening

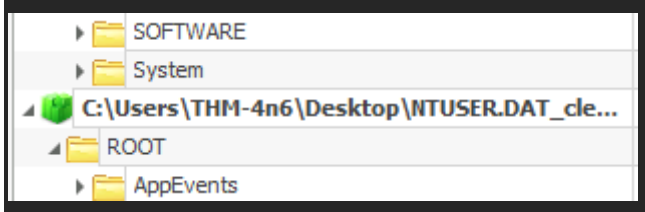
WOW! This one took me nearly 20 minutes to figure out how to look for it and where to find it!!!!

Still using Registry Editor, load up a new hive.

Task 5 teaches us to look here for recent file activity:

NTUSER.DAT\Software\Microsoft\Windows\CurrentVersion\Explorer\RecentDocs

You just need to find which user.



2021-11-24 18:18:48 --And now I realized it is the username for the current user😛

Values | Recent documents

Drag a column header here to group by that column

Extension	Value Name	Target Name	Lnk Name	Mru Position	Opened On	Extension Last Opened
.txt	0	ChangeLog.txt	ChangeLog.lnk	0	2021-11-24 18:18:48	

What is the complete path from where the python 3.8.2 installer was run?

Hint: Check the evidence of execution artifacts

I'm going to assume this was done on command line and will not be found in User Assist registry keys; let's try the ShimCache

SYSTEM\CurrentControlSet\Control\Session Manager\AppCompatCache

But Registry Explore can't help us here; we need AppCompatCache Parser--But I can't seem to get this to work. Looking back, I see I can find the info on AmCache, too.

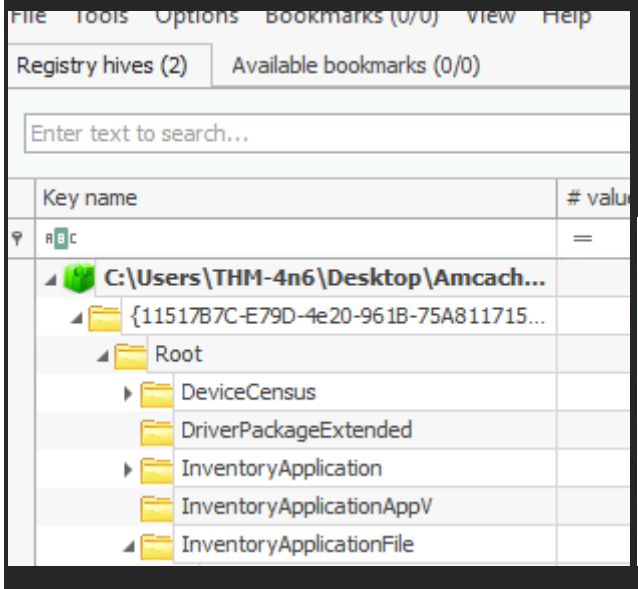
C:\Windows\appcompat\Programs\Amcache.hve

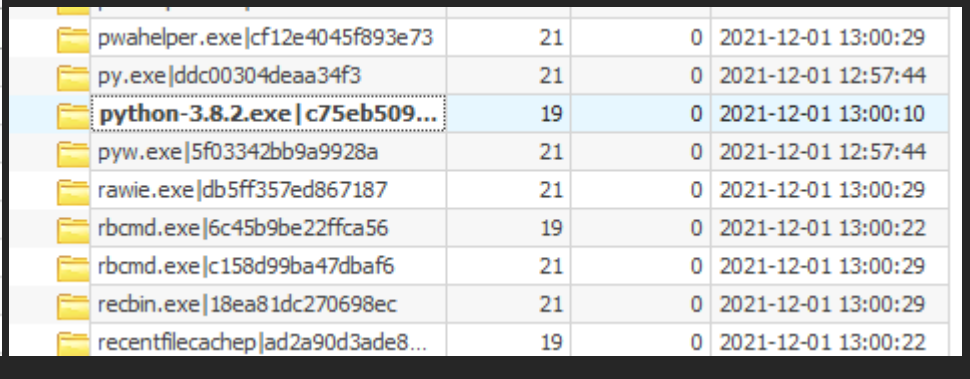
Information about the last executed programs can be found at the following location in the hive:

Amcache.hve\Root\File\{Volume GUID}\

I had too look at the screenshot when it talks about AmCache; it's not "File" but "InventoryApplicationFile\

Amcache.hve\Root\InventrotyApplicationFile\python-3.8.2.exe





c:\users\thm-4n6\appdata\local\package cache\{3182483d-078b-48fa-92c2-798baa1fe27d}\python-3.8.2.exe

Registry file: C:\Users\THM-4n6\Desktop\Amcache.hve_clean

Key: Root\InventoryApplicationFile\python-3.8.2.exe|c75eb5095c91ccff
Last write: 2021-12-01 13:00:10
Value: LowerCaseLongPath (RegSz)
Data: c:\users\thm-4n6\appdata\local\package cache\{3182483d-078b-48fa-92c2-798baa1fe27d}\python-3.8.2.exe
Slack: 00-00

c:\ appdata\python-3.8.2.exe

Values

Drag a column header here to group by that column

Value Name	Value Type	Data	Value Slack	Is Deleted
ProgramId	RegSz	0000698aecae48db708e3c40f46dc402e1c00000ffff	00-00	
FileId	RegSz	00005ac9b7b0f46e289809878c5055978842ba017e7a	6E-00	
LowerCaseLongPath	RegSz	c:\users\thm-4n6\appdata\local\package cache\{3182483d-078b-48fa-92c2-798baa1fe27d}\python-3.8.2.exe	00-00	
LongPathHash	RegSz	python-3.8.2.exe|c75eb5095c91ccff		
Name	RegSz	python-3.8.2.exe	00-00	
OriginalFileName	RegSz	python-3.8.2.exe	00-00	
Publisher	RegSz	python software foundation	00-00-00-00-00-00	
Version	RegSz	3.8.2150.0	00-00-00-00-00-00	
BinFileVersion	RegSz	3.8.2150.0	23-00-08-C6-23-00	
BinaryType	RegSz	pe32_i386		
ProductName	RegSz	python 3.8.2 (32-bit)		
ProductVersion	RegSz	3.8.2150.0	00-00-00-00-00-00	
LinkDate	RegSz	11/18/2017 22:00:38	00-00-00-00	
BinProductVersion	RegSz	3.8.2150.0	00-00-00-00-00-00	
AppxPackageFullName	RegSz			
AppxPackageRelativeId	RegSz			

Type viewer | Slack viewer | Binary viewer

What is the complete path from where the python 3.8.2 installer was run?

Answer format: *******************.*.*.***

8 char remaining

c:\ python-3.8.2.exe

When was the USB device with the friendly name 'USB' last connected?

I honestly can't answer this after 40 minutes of smashing my head in

File Tools Options Bookmarks (0/0) View Help

Registry hives (2) | Available bookmarks (0/0)

3.8.2 | Find

Key name	# values	# subkeys	Last write timestamp
C:\Users\THM-4n6\Desktop\Amcach...			2021-11-25 03:13:59
{11517B7C-E79D-4e20-961B-75A811715...	0	1	2021-11-24 18:23:15
Root	0	25	2021-11-24 18:25:42
InventoryApplicationFile	2	596	2021-12-01 13:04:49
python-3.8.2.exe|c75eb5095c91...	19	0	2021-12-01 13:00:10
python-3.8.2.exe|4d23dde6fea9...	17	0	2021-11-24 18:23:15
Associated deleted records	0	0	
{11517B7C-E79D-4e20-961B-75A8117...	0	0	
Root	0	0	
InventoryApplicationFile	0	0	
python-3.8.2.exe|4d23dde6f...	17	0	2021-11-24 18:23:15
C:\Users\THM-4n6\Desktop\triage\...			2021-11-25 03:13:59
{11517B7C-E79D-4e20-961B-75A811715...	0	1	2021-11-24 18:23:15
Root	0	25	2021-11-24 18:25:42
InventoryApplicationFile	2	596	2021-12-01 13:04:49
python-3.8.2.exe|c75eb5095c91...	19	0	2021-12-01 13:00:10
python-3.8.2.exe|4d23dde6fea9...	17	0	2021-11-24 18:23:15
Associated deleted records	0	0	
{11517B7C-E79D-4e20-961B-75A8117...	0	0	
Root	0	0	
InventoryApplicationFile	0	0	
python-3.8.2.exe|4d23dd...	17	0	2021-11-24 18:23:15

A new day, new tactic

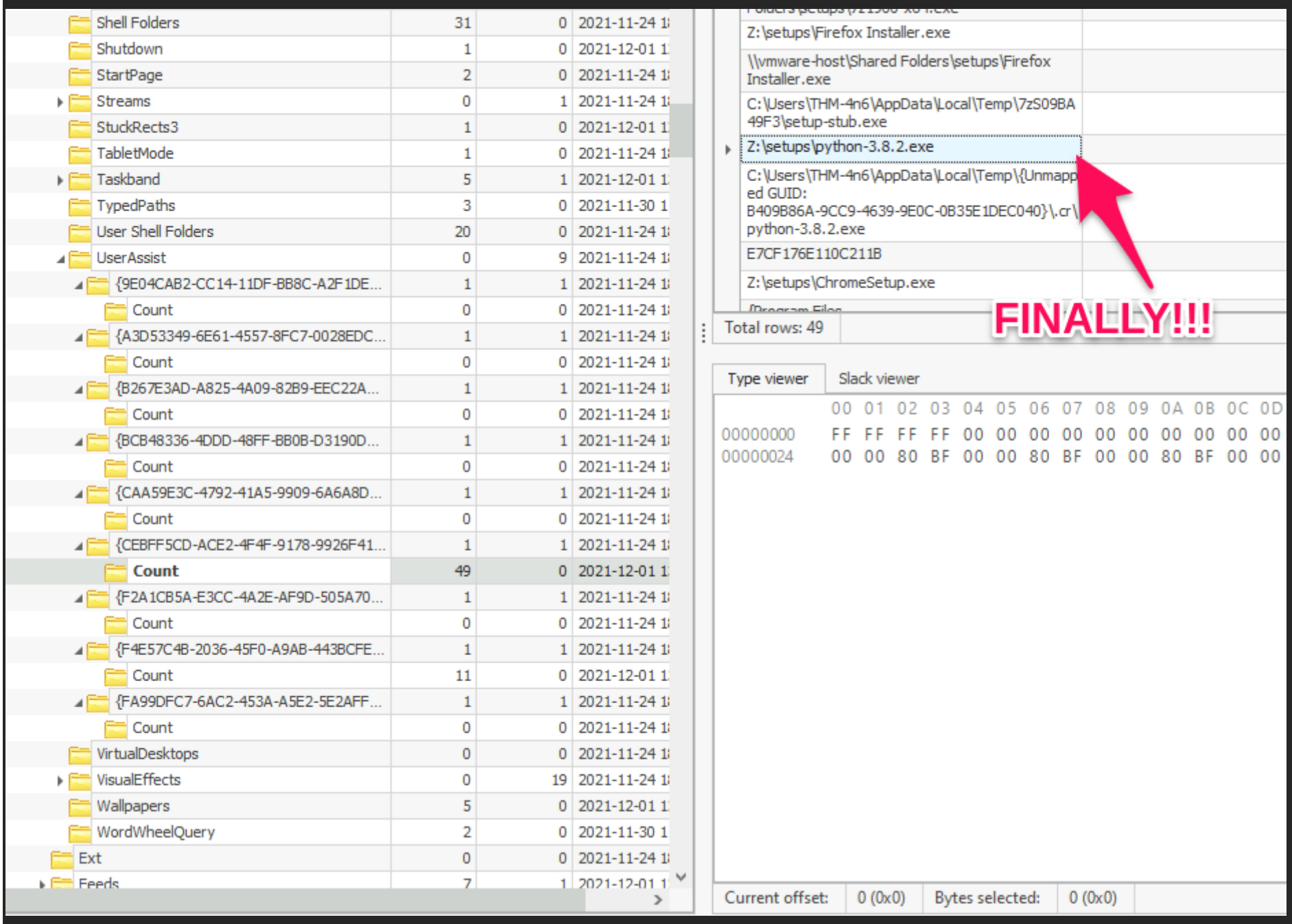
Going to

NTUSER.DAT\Software\Microsoft\Windows\Currentversion\Explorer\UserAssist\{GUID}\Count

I had no idea what the guid would be so I just opened them all to see the "count"

Two entries have values: 11 and 49

Looking under the 49 one--



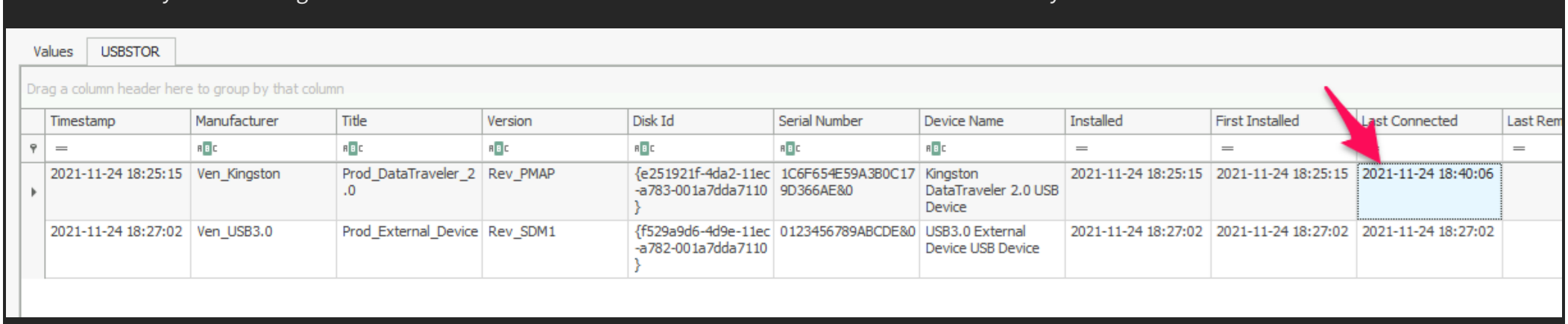
When was the USB device with the friendly name 'USB' last connected?

Hint: Format: yyyy-mm-dd hh:mm:ss

Having op[ened the SYSTEM hive, I see two USB devices, however I do not know how to determine their friendly names

That said, I enter the second date into THM but it is wrong; the first one works

I don't know why that is the right answer which bothers me because I want to link the device to the friendly name.



Task 9 Conclusion

WindowsForensicsCheatsheetTryHackMe.pdf 4 MB


Cheatsheet
System info and accounts
OS Version:
SOFTWARE\Microsoft\Windows NT\CurrentVersion
Current Control set:
HKLM\SYSTEM\CurrentControlSet
SYSTEM\Select\Current
SYSTEM\Select\LastKnownGood
Computer Name:
SYSTEM\CurrentControlSet\Control\ComputerName
\ComputerName
Time Zone Information:
SYSTEM\CurrentControlSet\Control
\TimeZoneInformation
Network Interfaces and Past Networks:
SYSTEM\CurrentControlSet\Services\Tcpip
\Parameters\Interfaces
Autostart Programs (Autoruns):
NTUSER.DAT\Software\Microsoft\Windows
\CurrentVersion\Run
NTUSER.DAT\Software\Microsoft\Windows
\CurrentVersion\RunOnce
SOFTWARE\Microsoft\Windows\CurrentVersion
\RunOnce
SOFTWARE\Microsoft\Windows\CurrentVersion
\policies\Explorer\Run
SOFTWARE\Microsoft\Windows\CurrentVersion\Run
SAM hive and user information:
SAM\Domains\Account\Users
File/folder usage or knowledge
Recent Files:
NTUSER.DAT\Software\Microsoft\Windows
\CurrentVersion\Explorer\RecentDocs
Office Recent Files:
NTUSER.DAT\Software\Microsoft\Office\VERSION
NTUSER.DAT\Software\Microsoft\Office\VERSION
\UserMRU\LiveID_####\FileMRU
ShellBags:
USRCLASS.DAT\Local Settings\Software\Microsoft
\Windows\Shell\Bags
USRCLASS.DAT\Local Settings\Software\Microsoft
\Windows\Shell\BagMRU
NTUSER.DAT\Software\Microsoft\Windows\Shell\BagMRU
NTUSER.DAT\Software\Microsoft\Windows\Shell\Bags
Open/Save and LastVisited Dialog MRUs:
NTUSER.DAT\Software\Microsoft\Windows
\CurrentVersion\Explorer\ComDlg32\OpenSavePIDlMRU
NTUSER.DAT\Software\Microsoft\Windows
\CurrentVersion\Explorer\ComDlg32\LastVisitedPidlMRU
Windows Explorer Address/Search Bars:
NTUSER.DAT\Software\Microsoft\Windows
\CurrentVersion\Explorer\TypedPaths
NTUSER.DAT\Software\Microsoft\Windows
\CurrentVersion\Explorer\WordWheelQuery
External/USB device forensics
Device identification:
SYSTEM\CurrentControlSet\Enum\USBSTOR
SYSTEM\CurrentControlSet\Enum\USB
First/Last Times:
SYSTEM\CurrentControlSet\Enum\USBSTOR
\Ven_Prod_Version\USBSerial#\Properties
\{83da6326-97a6-4088-9453-a19231573b29}\####
Oo64=first connection
0066=last connection
0067=last removal
USB device Volume Name:
SOFTWARE\Microsoft\Windows Portable Devices
\Devices
Evidence of execution
UserAssist:
NTUSER.DAT\Software\Microsoft\Windows
\Currentversion\Explorer\UserAssist\{GUID}\Count
ShimCache:
SYSTEM\CurrentControlSet\Control\Session Manager
\AppCompatCache
AmCache:
Amcache.hve\Root\File\{Volume GUID}\
BAM/DAM:
SYSTEM\CurrentControlSet\Services\bam\UserSettings
\{SID}
SYSTEM\CurrentControlSet\Services\dam\UserSettings
\{SID}