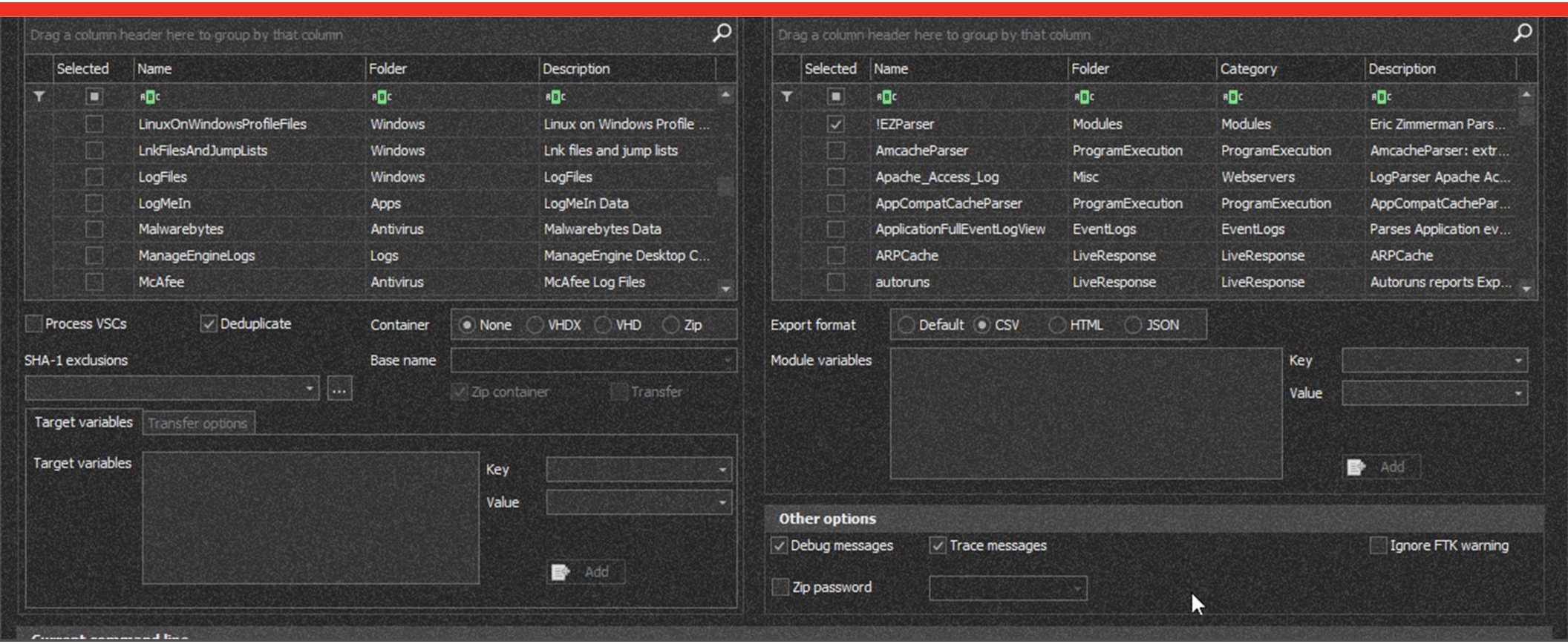


Artifact Analysis and Timelining with **KAPE**

May 2020

Private and Confidential

Kroll | A Division of DUFF & PHELPS

About Mari

- Associate Managing Director at Kroll
- SANS Instructor
- @MariDeGrazia

Overview

Triage Collection

KAPE

Mini Timelines

Analysis

Upcoming KAPE Intensive Training and Certification

- Virtual live sessions
- Max 25 students

bit.ly/kape2020

SCHEDULE	INSTRUCTORS
June 18, 2020 10:00 a.m. – 7:00 p.m. (EST)	Eric Zimmerman Mari DeGrazia Sean Straw
July 7, 2020 9:00 am – 6:00 pm (GMT + 8, Hong Kong/Singapore time)	Eric Zimmerman Paul Jackson Dave Klopp Rob Phillips

Approach

Triage Data

Filesystem

Registry

Event Logs

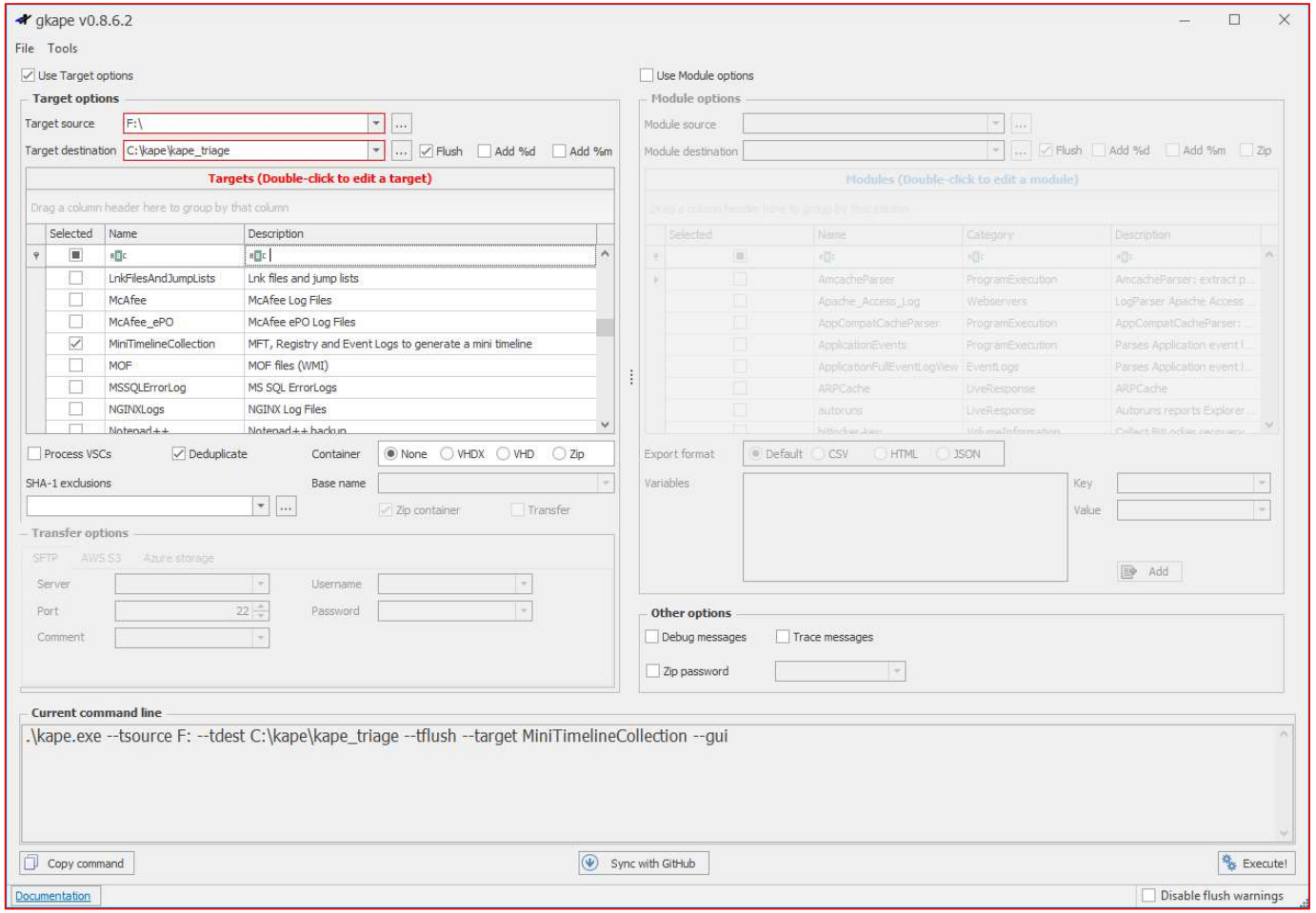
KAPE BASICS

- Targets
- Modules
- Mounted Image
- Live System

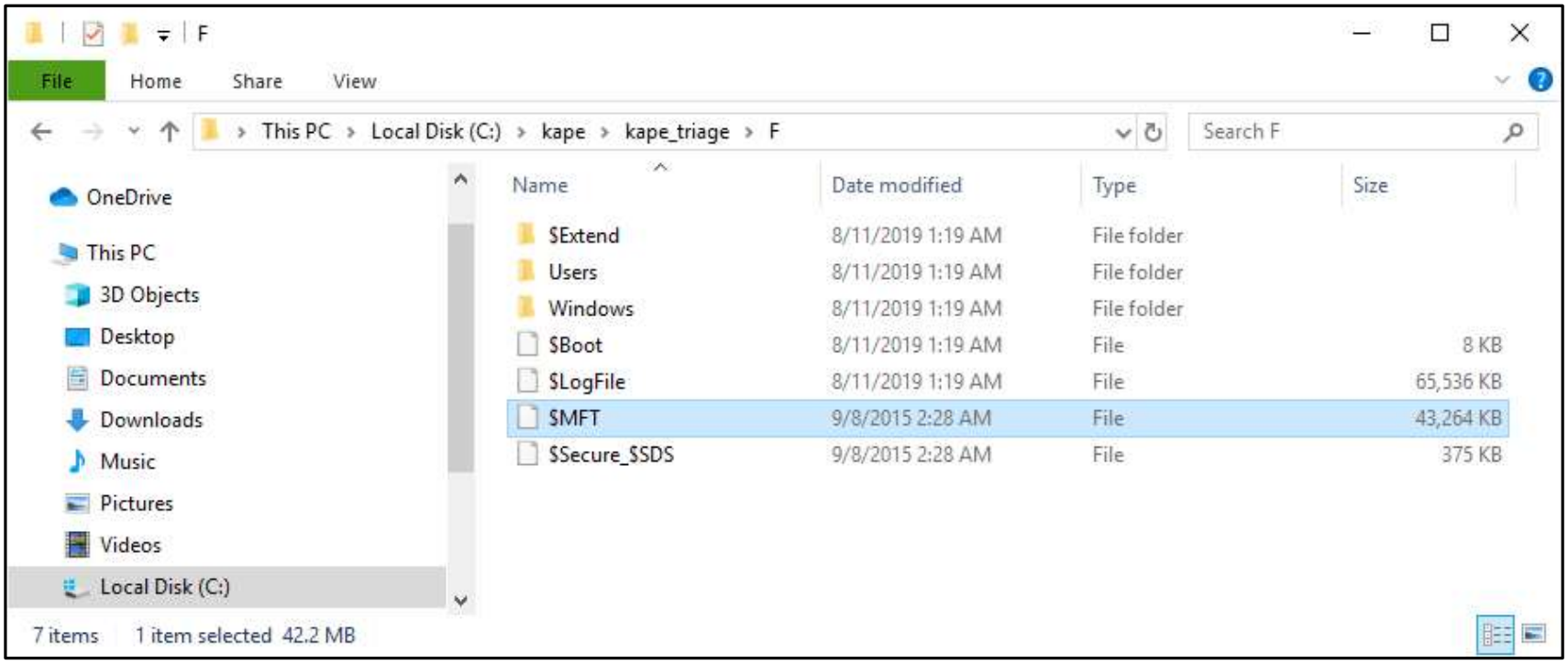
Triage Collection with KAPE

Target:

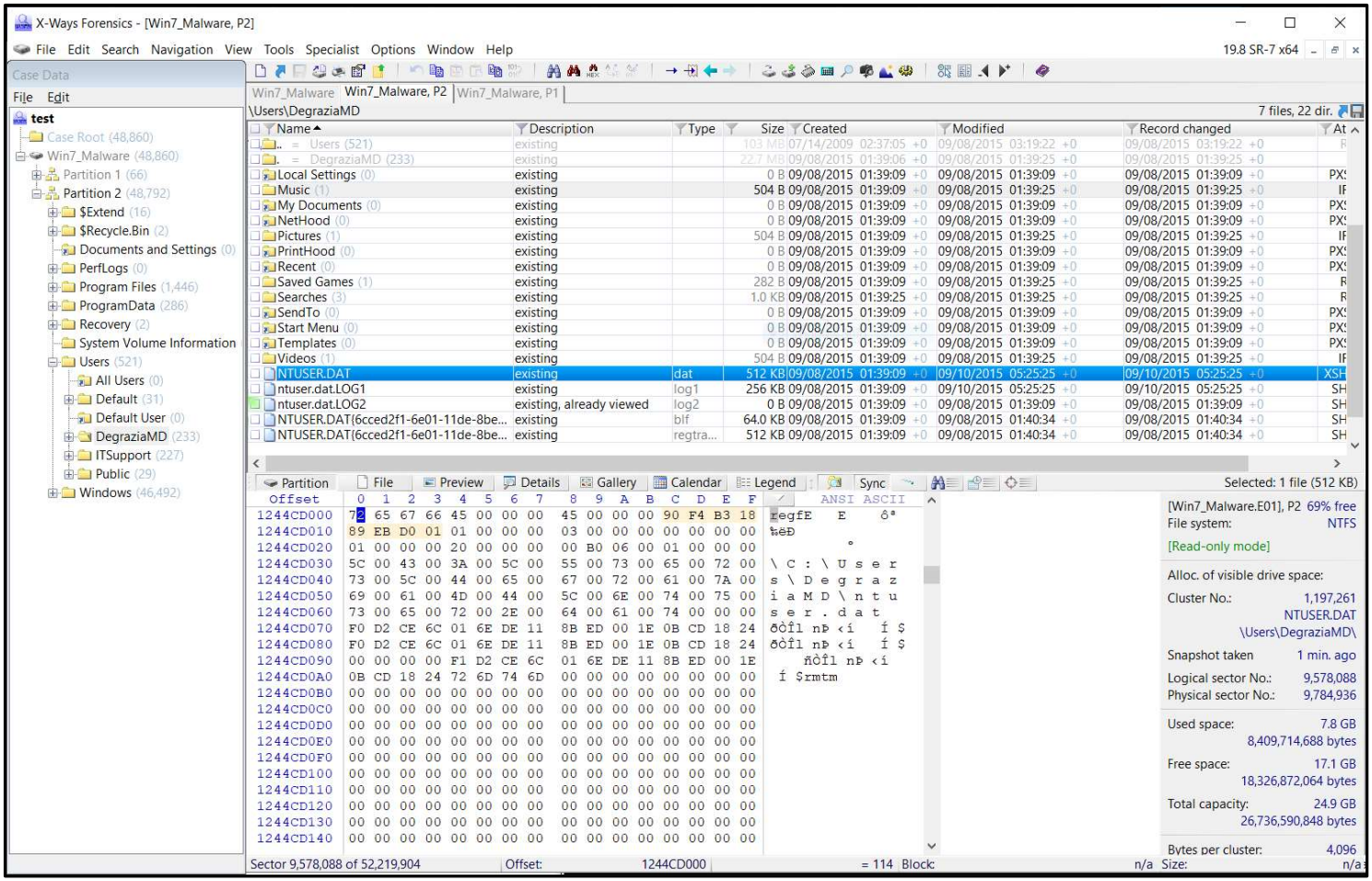
MiniTimelineCollection



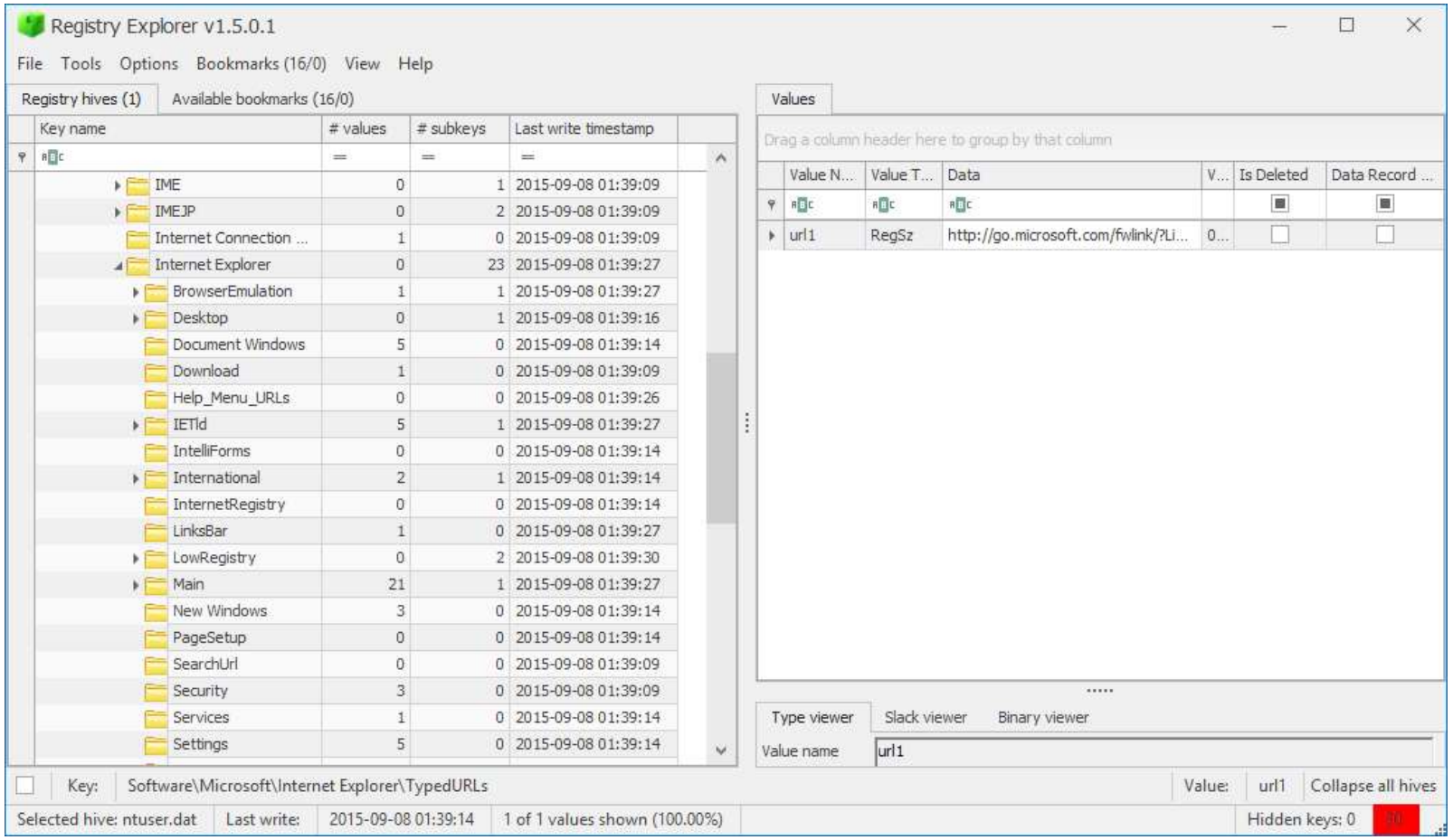
Triage Data Outputs



Data Munging



Data Munging



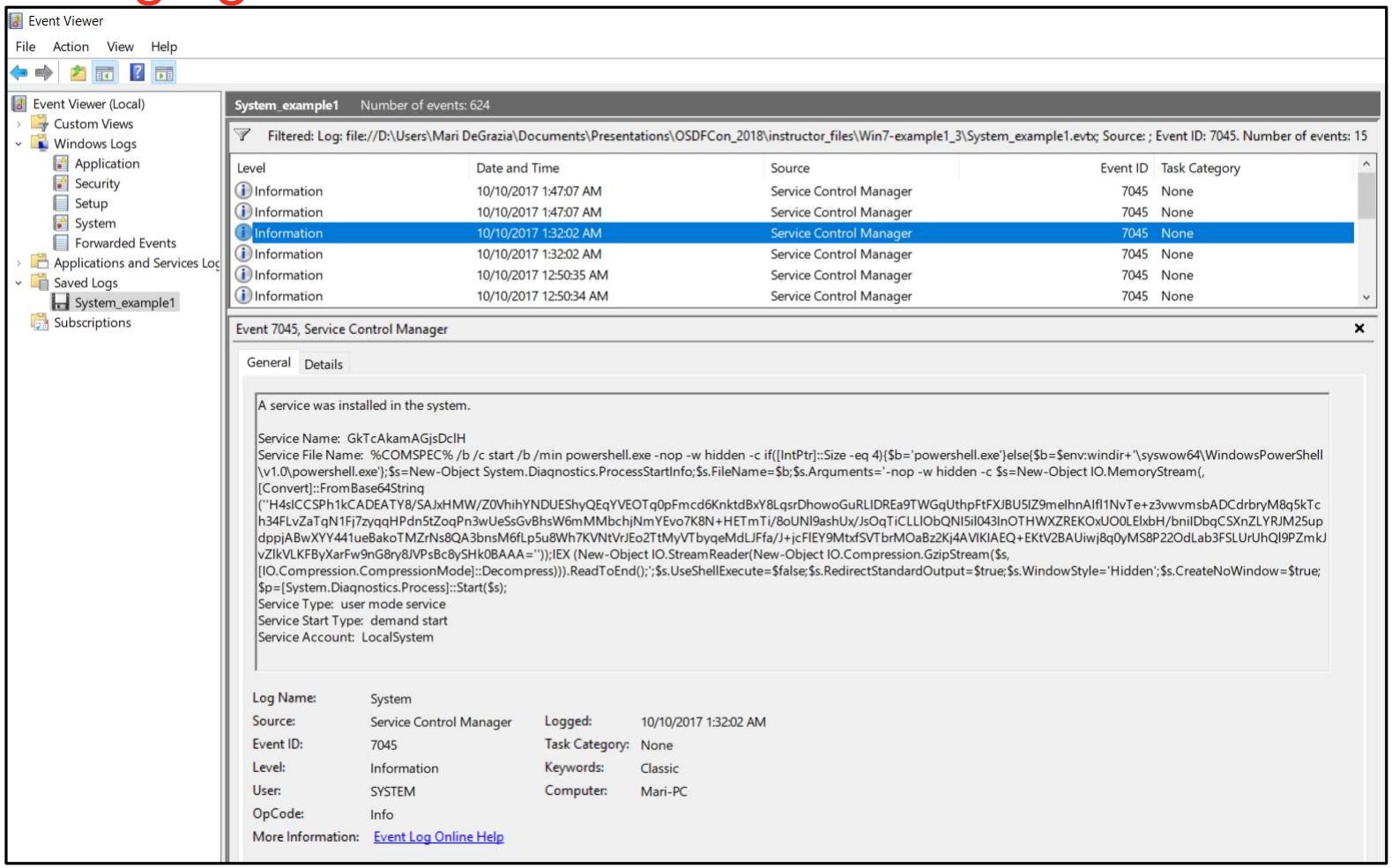
Data Munging

```
----------------------------------------
svc_plus v.20120625
(System) Lists services/drivers in Services key by LastWrite times in a short format with warnings for type mismatche

ControlSet001\Services
Lists services/drivers in Services key by LastWrite times in a short format with warnings for type mismatches; ^^^^ I

Sun Aug 11 00:41:48 2019Z,BITS,@%SystemRoot%\system32\qmgr.dll;-1000,%SystemRoot%\System32\svchost.exe -k netsvcs -p,
Sun Aug 11 00:06:03 2019Z,aimwrfltr,Arsenal Image Mounter Write Filter,System32\drivers\aimwrfltr.sys,,Boot Start,
Sat Aug 10 16:36:26 2019Z,phdskmnt,Arsenal Image Mounter SCSI Miniport,\SystemRoot\System32\drivers\phdskmnt.sys,,Man
Sat Aug 10 02:50:27 2019Z,TrustedInstaller,@%SystemRoot%\servicing\TrustedInstaller.exe;-100,%SystemRoot%\servicing\T
Sat Aug 10 01:37:20 2019Z,HidUsb,@input.inf;%HID.SvcDesc%;Microsoft HID Class Driver,\SystemRoot\System32\drivers\hid
Sat Aug 10 01:37:20 2019Z,kbdhid,@keyboard.inf;%KBDHID.SvcDesc%;Keyboard HID Driver,\SystemRoot\System32\drivers\kbdh
Fri Aug  9 14:50:23 2019Z,GoogleChromeElevationService,Google Chrome Elevation Service,"C:\Program Files (x86)\Google
Thu Aug  8 14:49:16 2019Z,LanmanServer\Parameters,,%SystemRoot%\system32\srvsvc.dll,,,
Thu Aug  8 14:49:16 2019Z,NdisTapi,@%systemroot%\system32\mprmsg.dll;-32001,System32\DRIVERS\ndistapi.sys,,Manual,
Thu Aug  8 14:49:16 2019Z,NdisWan,@%systemroot%\system32\mprmsg.dll;-32002,\SystemRoot\System32\drivers\ndiswan.sys,,
Thu Aug  8 14:49:16 2019Z,PptpMiniport,@%systemroot%\system32\mprmsg.dll;-32006,\SystemRoot\System32\drivers\raspptp.
Thu Aug  8 14:49:16 2019Z,RasAgileVpn,@netavpna.inf;%Svc-Mp-AgileVpn-DispName%;WAN Miniport (IKEv2),\SystemRoot\Syste
Thu Aug  8 14:49:16 2019Z,Rasl2tp,@%systemroot%\system32\mprmsg.dll;-32005,\SystemRoot\System32\drivers\rasl2tp.sys,,
Thu Aug  8 14:49:16 2019Z,RasPppoe,@%systemroot%\system32\mprmsg.dll;-32007,System32\DRIVERS\raspppoe.sys,,Manual,
Thu Aug  8 14:49:16 2019Z,RasSstp,@%systemroot%\system32\sstpsvc.dll;-202,\SystemRoot\System32\drivers\rassstp.sys,,M
Thu Aug  8 14:49:15 2019Z,BcastDVRUserService_35377,BcastDVRUserService_35377,C:\WINDOWS\system32\svchost.exe -k Bcas
Thu Aug  8 14:49:15 2019Z,BluetoothUserService_35377,BluetoothUserService_35377,C:\WINDOWS\system32\svchost.exe -k Bt
Thu Aug  8 14:49:15 2019Z,CaptureService_35377,CaptureService_35377,C:\WINDOWS\system32\svchost.exe -k LocalService -
Thu Aug  8 14:49:15 2019Z,cbdhsvc_35377,cbdhsvc_35377,C:\WINDOWS\system32\svchost.exe -k ClipboardSvcGroup -p,^^^^224
```

Data Munging



Why Timelines

- Combine Artifacts
- Normalize Timestamps
- Build Connections
- Reporting

TLN Timeline Format

Time | Source | Host | User | Description

- Time: 32 Bit Unix Epoch
- Source: EVT, REG, FILE etc.
- Host: Computer Name, IP address, etc.
- User: Username, SID, IM Screen name, etc.
- Description: Description of event

https://forensicswiki.xyz/wiki/index.php?title=TLN

2015-09-10 05:25:18	FILE	DeGraziaMD-PC		MACB [15840] c:/Windows/Prefetch/NOTEPAD.EXE-D8414F97.pf ($FILE_NAME)
2015-09-10 05:25:18	FILE	DeGraziaMD-PC		MACB [15840] c:/Windows/Prefetch/NOTEPAD.EXE-D8414F97.pf
2015-09-10 05:25:18	FILE	DeGraziaMD-PC		MAC. [0] c:/Windows/Prefetch
2015-09-10 05:25:17	EVTX	DegraziaMD-PC		Microsoft-Windows-Security-Auditing/4634;;An account was logged off;Target: DegraziaMD-PC\ITSupport;LogonType: 3;{ EventData":{"D
2015-09-10 05:25:14	FILE	DeGraziaMD-PC		M.C. [1248] c:/ProgramData/Microsoft/Search/Data/Applications/Windows/GatherLogs/SystemIndex/SystemIndex.2.Crwl
2015-09-10 05:25:14	FILE	DeGraziaMD-PC		M.C. [8284] c:/ProgramData/Microsoft/Search/Data/Applications/Windows/GatherLogs/SystemIndex/SystemIndex.2.gthr
2015-09-10 05:25:12	REG	DeGraziaMD-PC		M... HKLM_SOFTWARE/Microsoft/Windows Search/Gather/Windows/SystemIndex/Crawls
2015-09-10 05:25:12	FILE	DeGraziaMD-PC		M.C. [11954] c:/Windows/Prefetch/SEARCHPROTOCOLHOST.EXE-0CB8CADE.pf
2015-09-10 05:25:12	REG	DeGraziaMD-PC		M... HKLM_SOFTWARE/Microsoft/Windows Search/CatalogNames/Windows/SystemIndex
2015-09-10 05:25:08	REG	DeGraziaMD-PC	\DegraziaMD\ntuser.dat	M... HKEY_USER/Software/Microsoft/Windows/CurrentVersion/Explorer/FileExts/.lnk
2015-09-10 05:25:08	REG	DeGraziaMD-PC	\DegraziaMD\ntuser.dat	M... HKEY_USER/Software/Microsoft/Windows/CurrentVersion/Explorer/FileExts/.lnk/OpenWithProgids
2015-09-10 05:25:08	REG	DeGraziaMD-PC	\DegraziaMD\ntuser.dat	[Program Execution] UserAssist - {A77F5D77-2E2B-44C3-A6A2-ABA601054A51}\Accessories\Notepad.lnk (1)
2015-09-10 05:25:08	REG	DeGraziaMD-PC	\DegraziaMD\ntuser.dat	[Program Execution] UserAssist - {D65231B0-B2F1-4857-A4CE-A8E7C6EA7D27}\notepad.exe (1)
2015-09-10 05:25:08	REG	DeGraziaMD-PC	\DegraziaMD\ntuser.dat	M... HKEY_USER/Software/Microsoft/Windows/CurrentVersion/Explorer/FileExts/.lnk/OpenWithList
2015-09-10 05:25:08	REG	DeGraziaMD-PC	\DegraziaMD\ntuser.dat	M... HKEY_USER/Software/Microsoft/Windows/CurrentVersion/Explorer/FileExts

Tools that have the TLN Format

- Harlan Carvey (Free)
- Plaso (Free)
- TZWorks (Commercial)

Tools Used

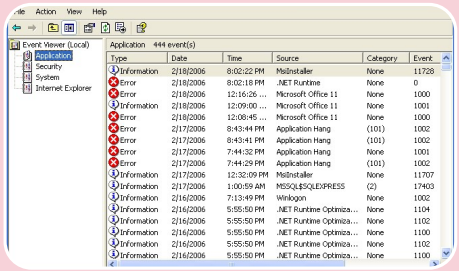
MFTECmd

Bodyfile

Regtime

Rip.exe

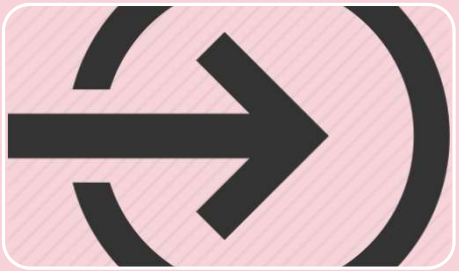
(RegRipper)



Evtparse.exe

EvtxEcmd.exe

evtxECmd_2_tln



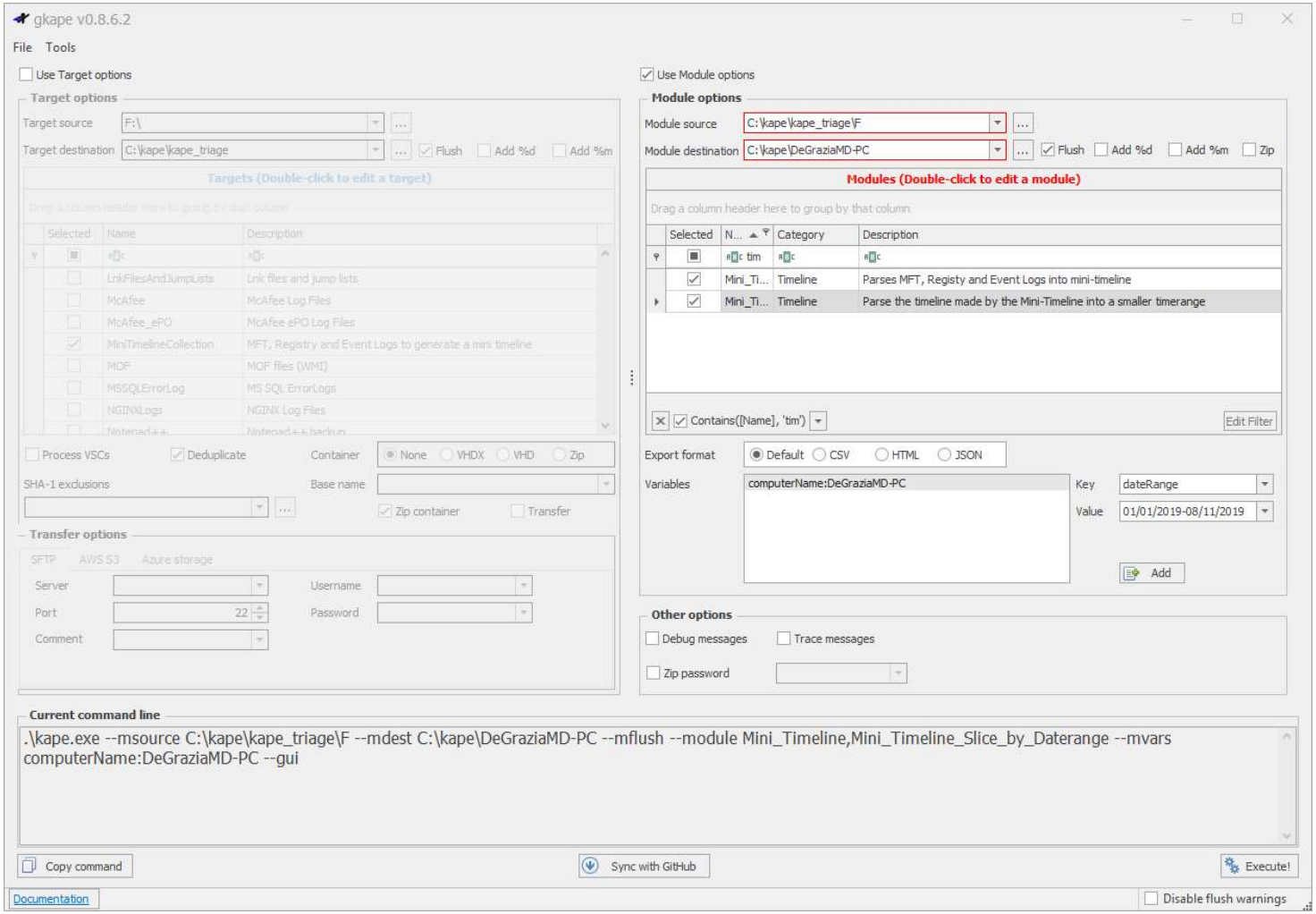
Unicode_2_ascii

Parse.exe

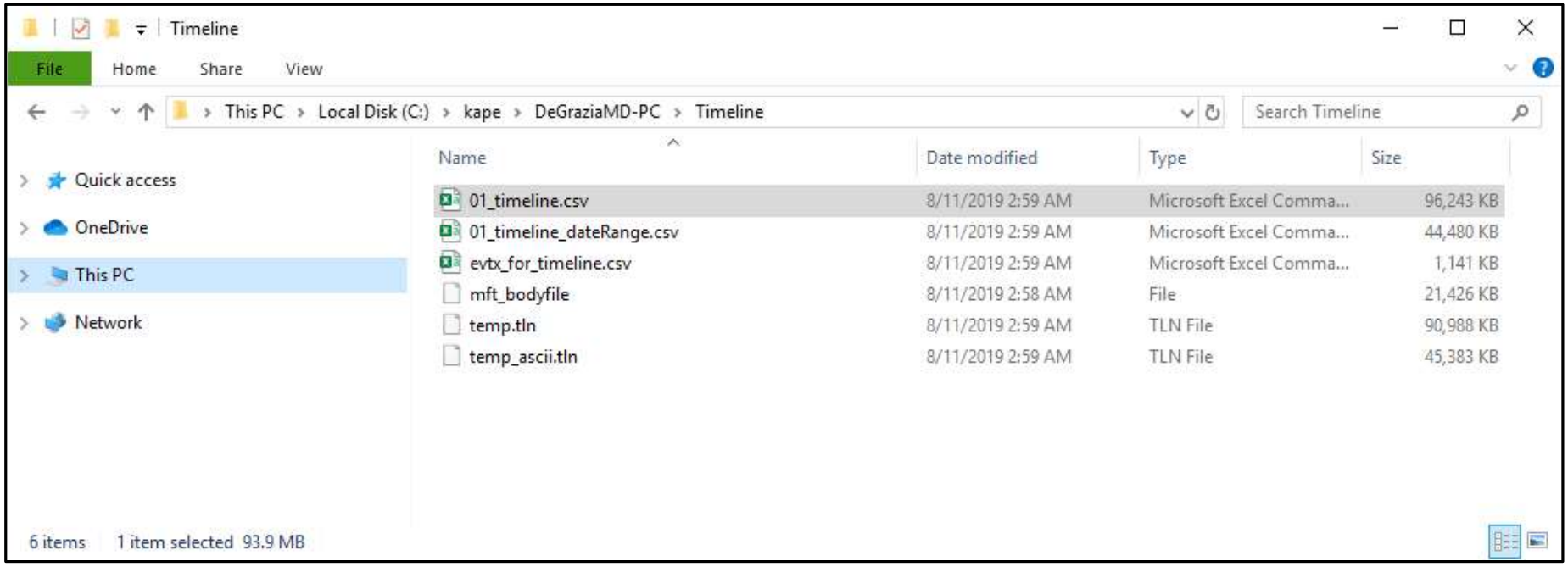
Timelining with KAPE

- Module Name: Mini_Timeline
  Add Key/Value: computerName:Mari-PC

- Module Name: Mini_Timeline_Slice_by_Daterange
  - Add Key/Value: dateRange: 01/01/2019-07/29/2019


gkape v0.8.6.2
File Tools
Use Target options
Target options
Target source F:\
Target destination C:\kape\kape_triage
Flush Add %d Add %m
Targets (Double-click to edit a target)
Drag a column header here to group by that column
Selected Name Description
LnkFilesAndJumpLists Lnk files and jump lists
McAfee McAfee Log Files
McAfee_ePO McAfee ePO Log Files
MiniTimelineCollection MFT, Registry and Event Logs to generate a mini timeline
MOF MOF files (WMI)
MSSQLErrorLog MS SQL ErrorLogs
NGINXLogs NGINX Log Files
Process VSCs Deduplicate Container None VHDX VHD Zip
SHA-1 exclusions Base name
Zip container Transfer
Transfer options
SFTP AWS S3 Azure storage
Server Username
Port 22 Password
Comment
Use Module options
Module options
Module source C:\kape\kape_triage\F
Module destination C:\kape\DeGraziaMD-PC
Flush Add %d Add %m Zip
Modules (Double-click to edit a module)
Drag a column header here to group by that column
Selected N... Category Description
tim
Mini_Ti... Timeline Parses MFT, Registy and Event Logs into mini-timeline
Mini_Ti... Timeline Parse the timeline made by the Mini-Timeline into a smaller timerange
Contains([Name], 'tim')
Edit Filter
Export format Default CSV HTML JSON
Variables computerName:DeGraziaMD-PC
Key dateRange
Value 01/01/2019-08/11/2019
Add
Other options
Debug messages Trace messages
Zip password
Current command line
.\kape.exe --msource C:\kape\kape_triage\F --mdest C:\kape\DeGraziaMD-PC --mflush --module Mini_Timeline,Mini_Timeline_Slice_by_Daterange --mvars computerName:DeGraziaMD-PC --gui
Copy command
Sync with GitHub
Execute!
Documentation
Disable flush warnings

Results


Timeline
File
Home
Share
View
This PC
Local Disk (C:)
kape
DeGraziaMD-PC
Timeline
Search Timeline
Quick access
OneDrive
This PC
Network
Name
Date modified
Type
Size
01_timeline.csv
8/11/2019 2:59 AM
Microsoft Excel Comma...
96,243 KB
01_timeline_dateRange.csv
8/11/2019 2:59 AM
Microsoft Excel Comma...
44,480 KB
evtx_for_timeline.csv
8/11/2019 2:59 AM
Microsoft Excel Comma...
1,141 KB
mft_bodyfile
8/11/2019 2:58 AM
File
21,426 KB
temp.tln
8/11/2019 2:59 AM
TLN File
90,988 KB
temp_ascii.tln
8/11/2019 2:59 AM
TLN File
45,383 KB
6 items
1 item selected 93.9 MB

Analysis

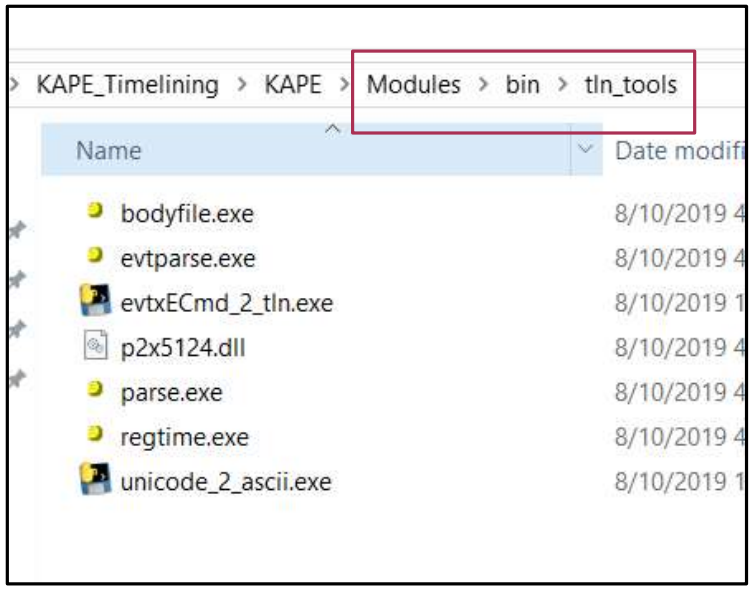
- Pivot Points
- Move up and down for selected time
- Deep dive findings

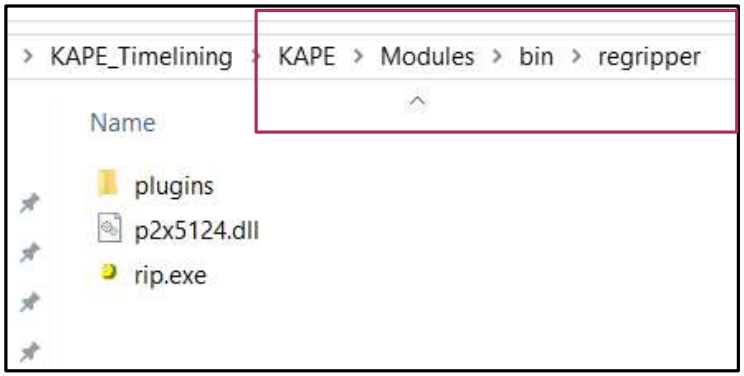
Setup

- Add exe files to the bin folder
  - Check modules for bin path

  Run Get-KAPEUpdate.ps1

  Synch with GitHub





How to make a TLN Module

- Copy existing one
- Modify
  - ExportFile: temp.tln
  - Append: true
  - Change GUID
- Add module to Mini_Timeline.mkape

Questions

- KAPE – free download here
- Eric Zimmerman Tools – https://ericzimmerman.github.io/
- RegRipper – free download: https://github.com/keydet89/RegRipper2.8
- Harlan Carvey's Timeline Tools: https://github.com/keydet89/Tools
- Unicode to Ascii: https://github.com/classicsc/Unicode2Ascii/releases
- evtxECmd_2_tln.exe: https://github.com/mdegrazia/KAPE_Tools

For More **KAPE**:
Intensive Training and Certification

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- Max 25 students

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