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Digital Forensics of RAM Images Using VOLIX II

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IT Forensik
FH Aachen

Contents

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Introduction

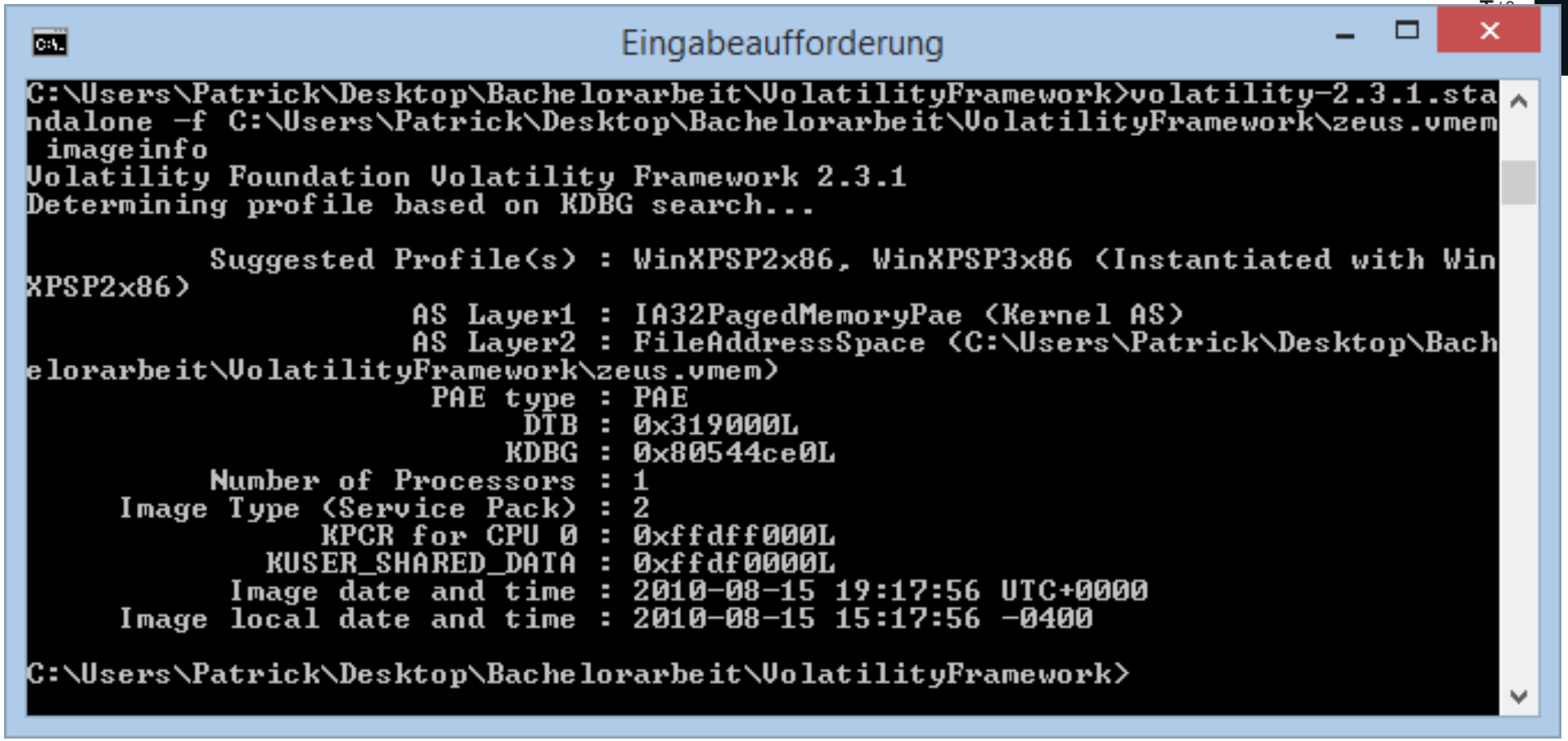
- Volatility Framework
  - Open source
  - Is under constant development
  - Many different commands

  - Command line program
  - Requires good knowledge of the commands

Introduction

- Investigation with the Volatility Framework
  - Type in every command
  - Set all parameters manually
  - Extract information for parameters from results
  - No documentation of the procedure

Introduction

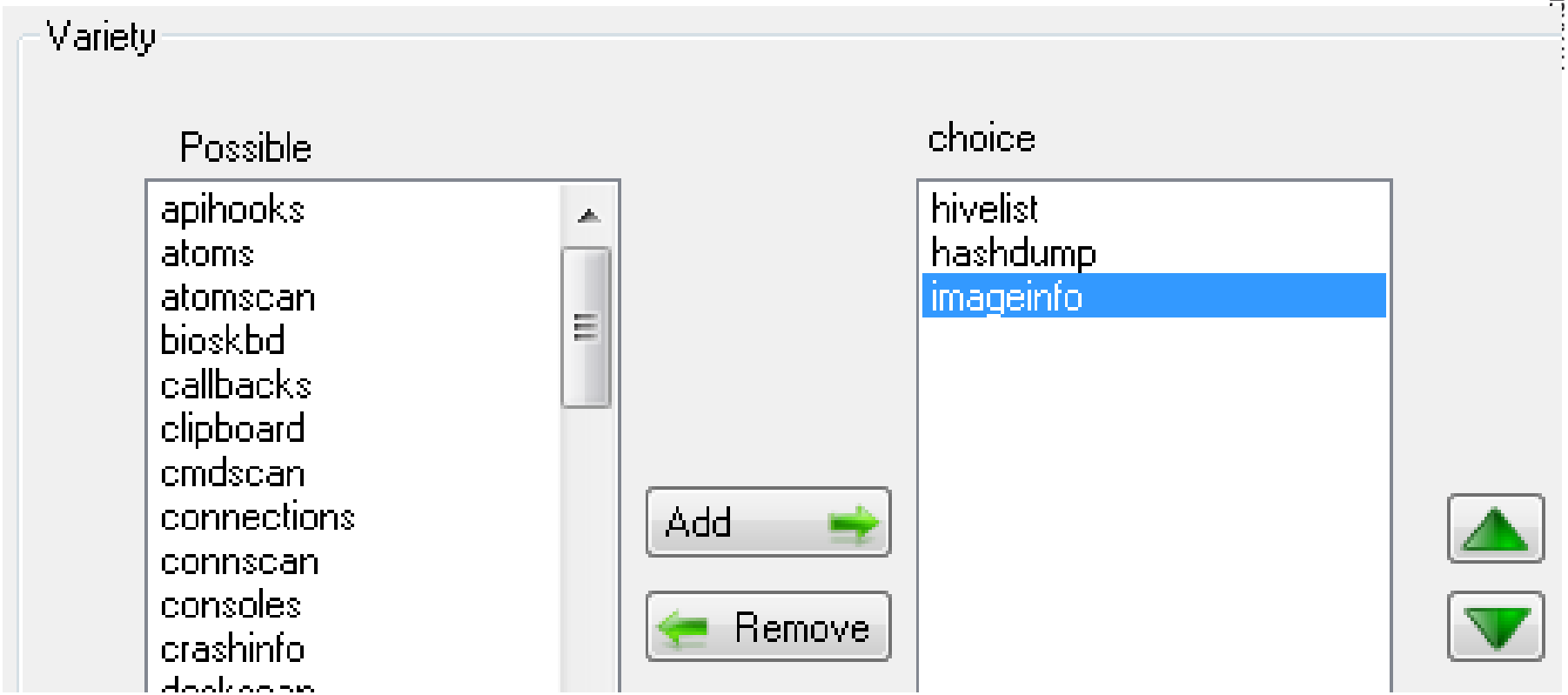


Introduction

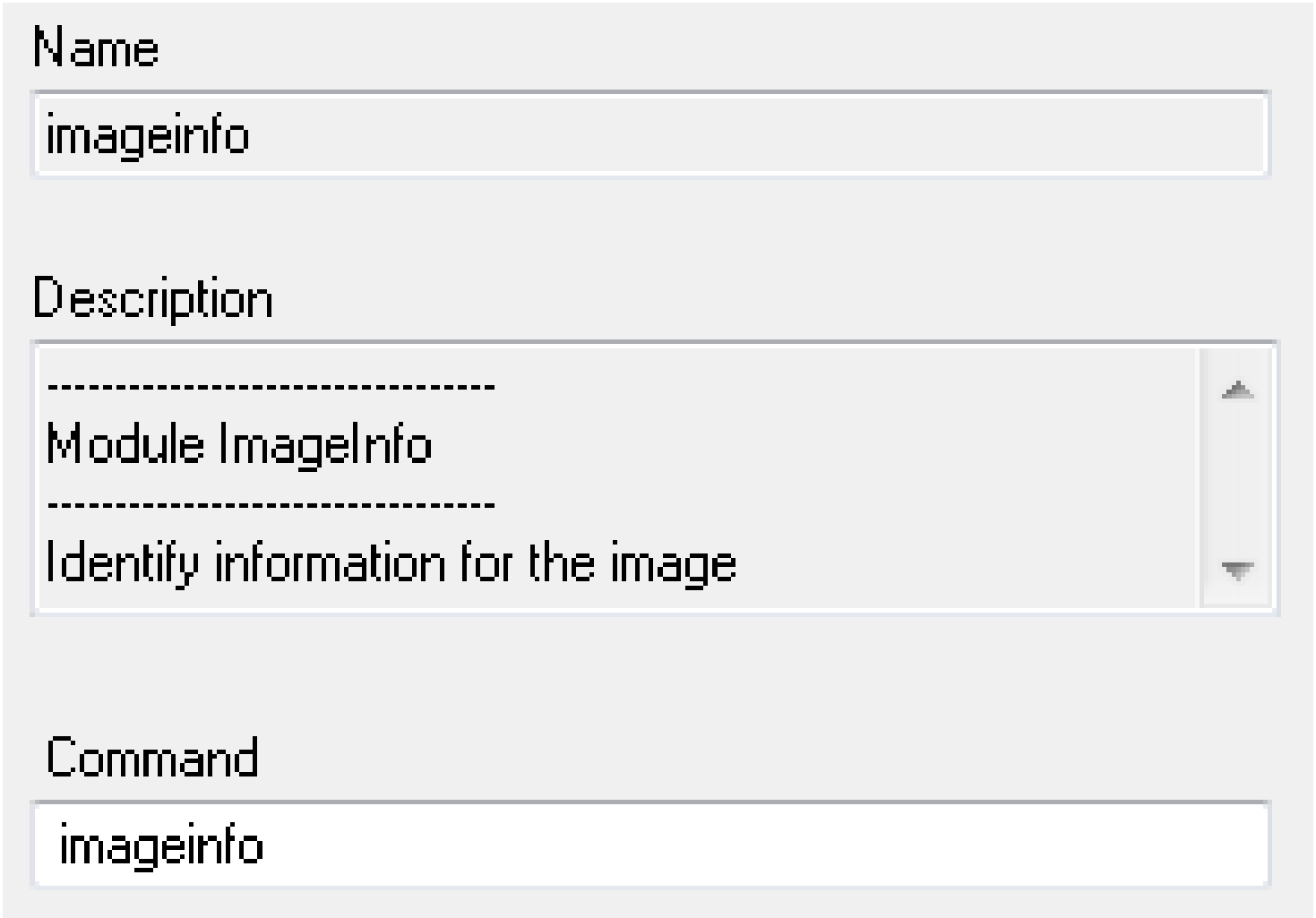
- Volix II (**Vol**atility **I**nterface & E**x**tensions)
  - Interface for the Volatility Framework
  - Embed other programs

- Investigation with Volix II (Version 1)
  - Add commands easily
  - Set all parameters manually
  - Extract information for parameters from results
  - Simple documentation

Introduction



Introduction



Introduction

Result

Buttons for the selected job:

Button for automatic run:

Command

```
imageinfo
```

```
Volatility Foundation Volatility Framework 2.3.1
Determining profile based on KDBG search...
          Suggested Profile(s) : WinXPSP2x86, WinXPSP3x86 (Instantiated with WinXPSP2x86)
                     AS Layer1 : IA32PagedMemoryPae (Kernel AS)
                     AS Layer2 : FileAddressSpace (C:\Untersuchungen\Untersuchung_BlackEnergy
                      PAE type : PAE
                           DTB : 0x319000L
                          KDBG : 0x80544ce0L
        Number of Processors : 1
     Image Type (Service Pack) : 2
                KPCR for CPU 0 : 0xffdff000L
             KUSER_SHARED_DATA : 0xffdf0000L
           Image date and time : 2010-08-15 19:22:11 UTC+0000
     Image local date and time : 2010-08-15 15:22:11 -0400
```

Contents

Problems and Solutions

- Problem
  - Volatility Framework 2.2 integrated
  - Current version 2.3.1 has much more commands
- Solution
  - Support version 2.3.1
  - Implement all commands

Problems and Solutions

- Problem
  - Extensive investigation
  - Start each command
  - Inspect all results precisely
  - Parameterize each command

  - Takes a long time

Problems and Solutions

- Solution
  - Automate investigation
  - Let commands run parallel

  - Start up to three ready commands
  - When a command is finished examine its result
  - Set parameters for commands
  - Repeat until no command can be started

Problems and Solutions

- Problem
  - User has to know the commands
  - Dependencies among commands
- Solution
  - Assistance in the form of Wizards
  - Questionnaire for the user

Problems and Solutions

- Problem
  - Simple final report
  - Plain text file with all the information

- Solution
  - Information in XML-File
  - Representation by XSL file

Problems and Solutions

- Further improvements
  - Better helpfile for the program
  - Case example in the helpfile

  - Individual dialog view for „hashdump“
  - Extract SAM hashes
  - Crack hashes with John the Ripper

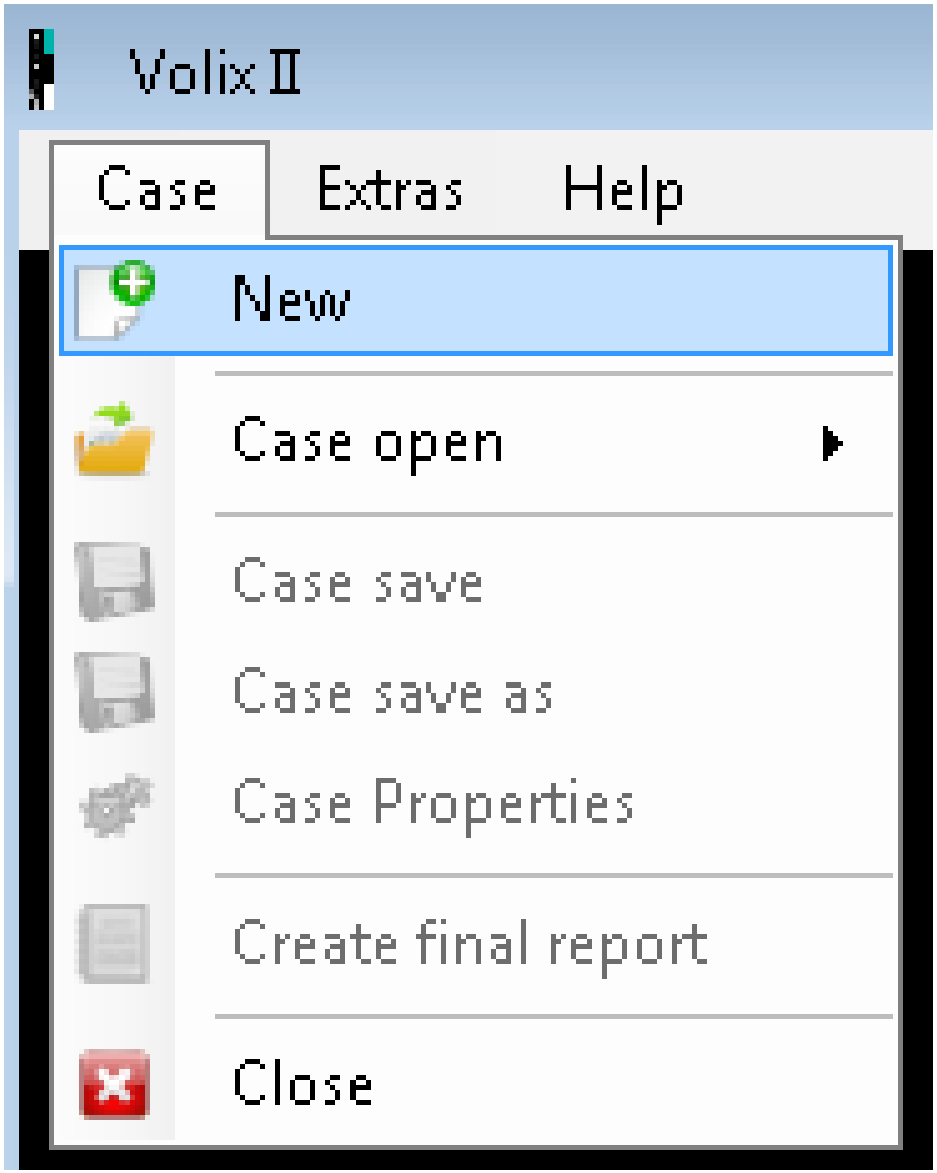
Contents

Case example

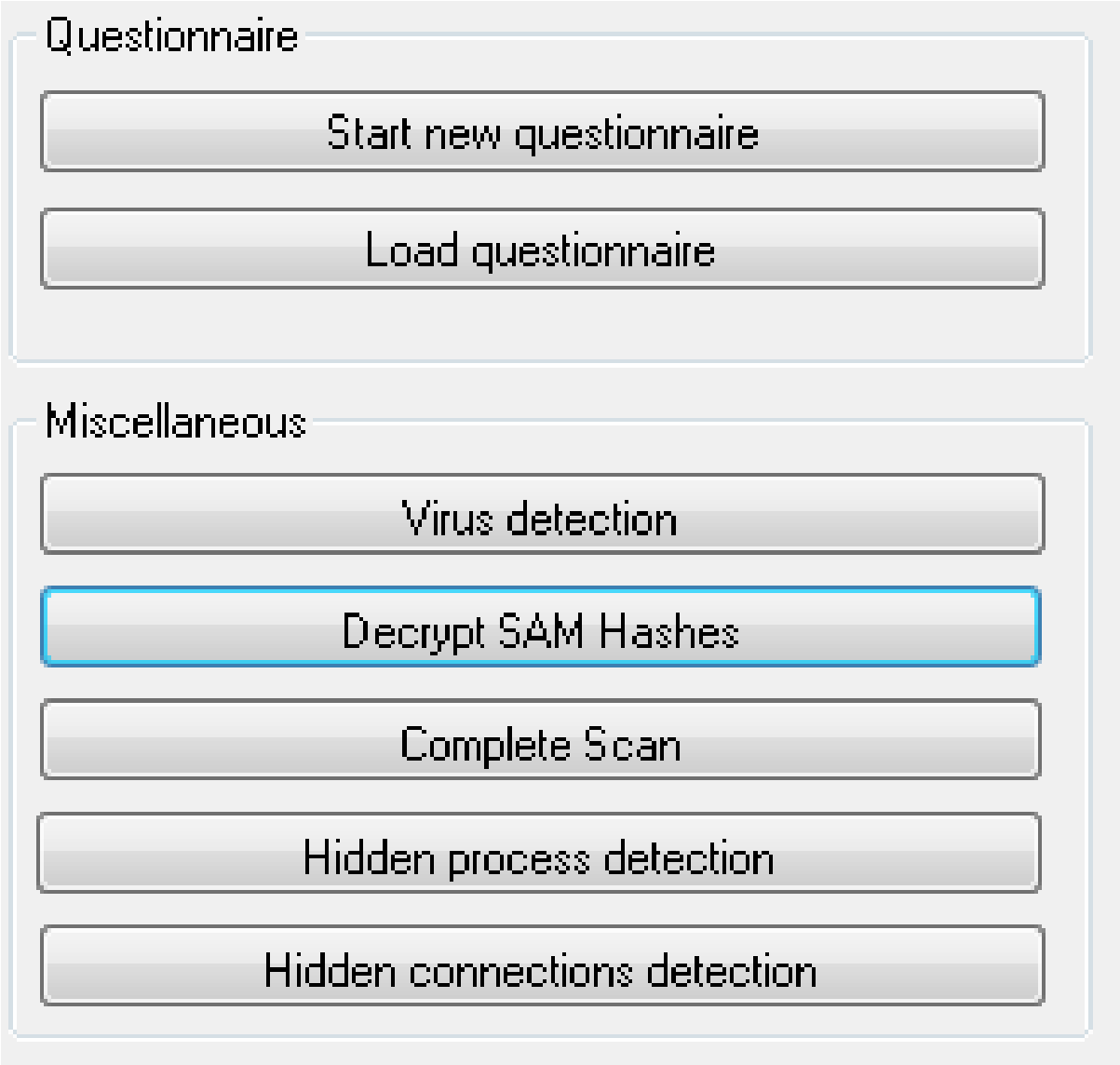
- Preparation
  - Create folder structure
  - Provide RAM image

  - Investigation_BlackEnergy
    - ResultDumps
    - Miscellanous

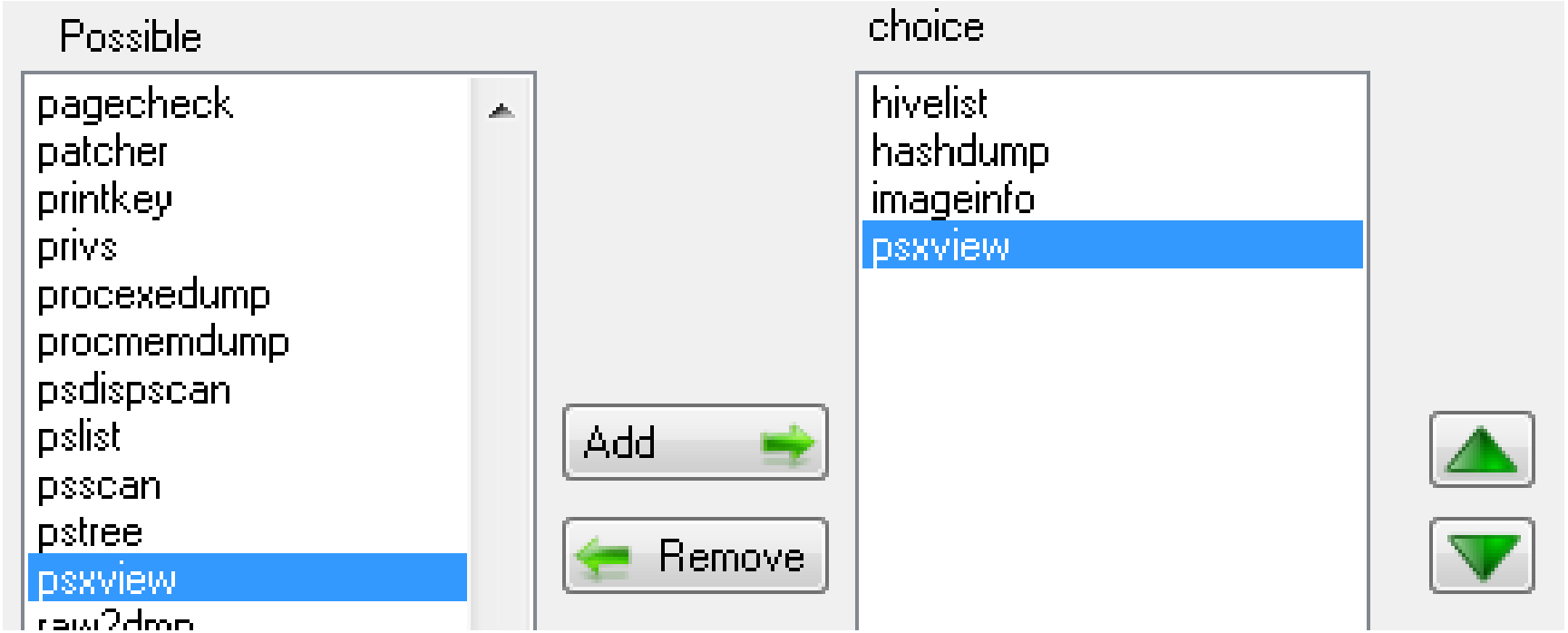
Case example



Case example



Case example



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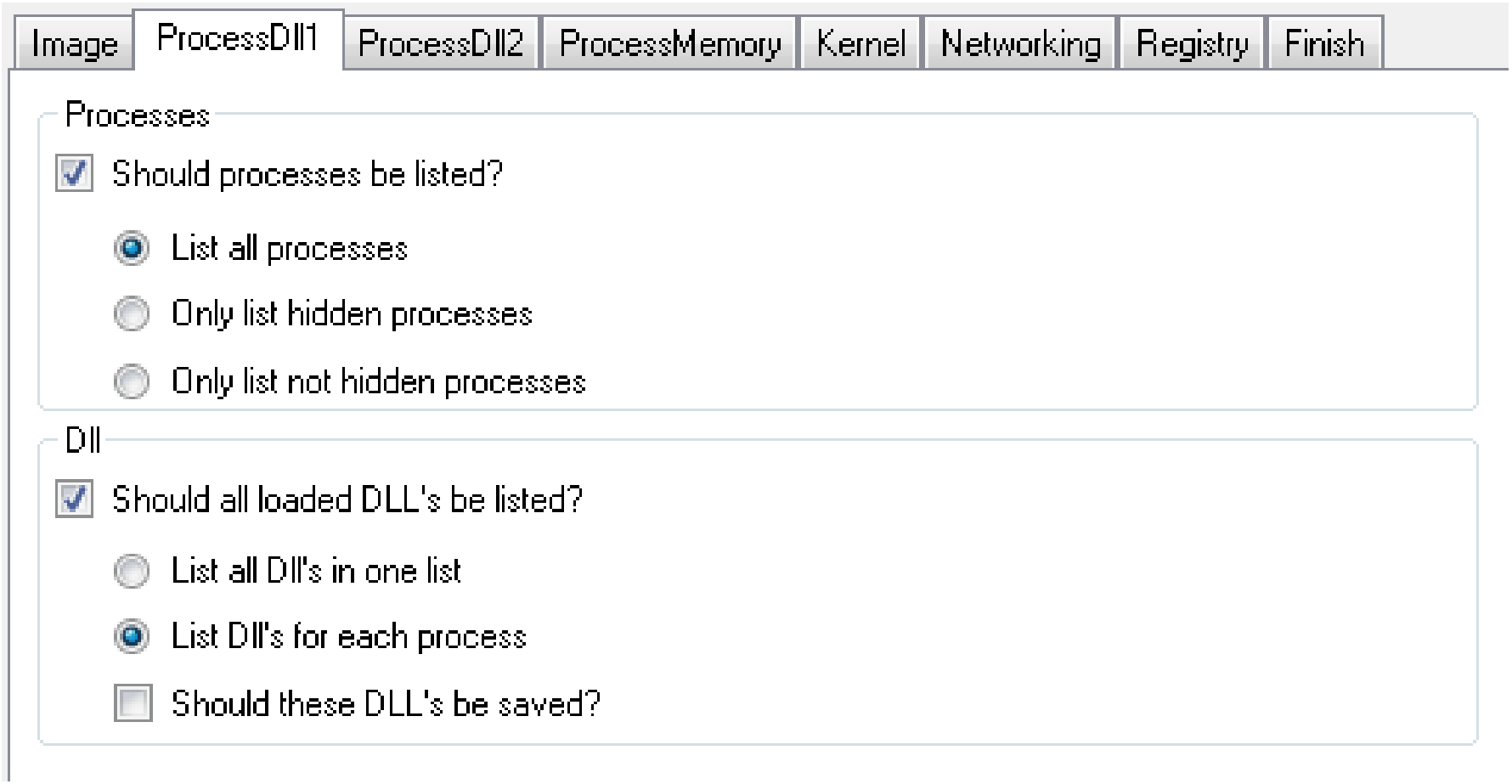

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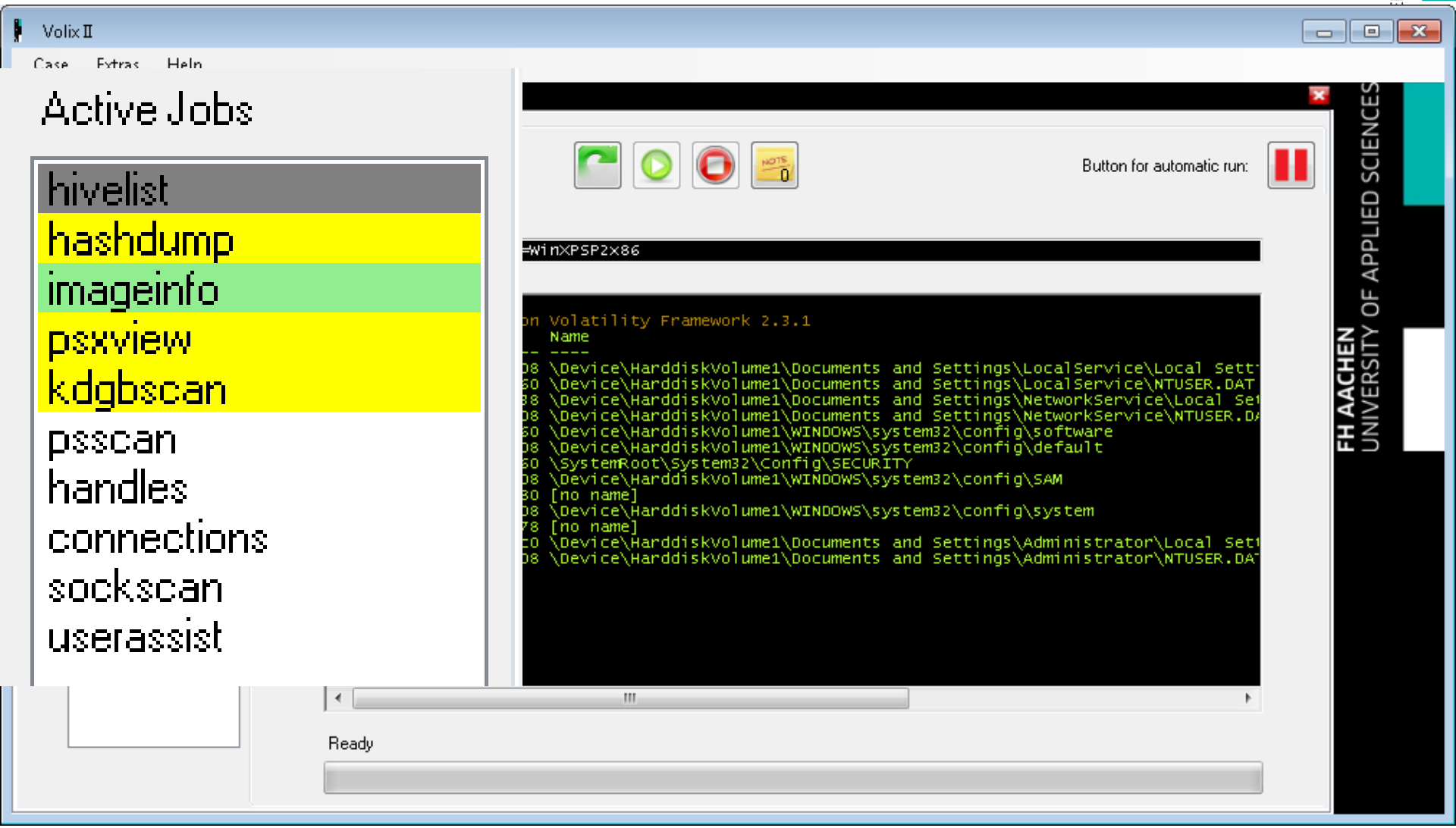
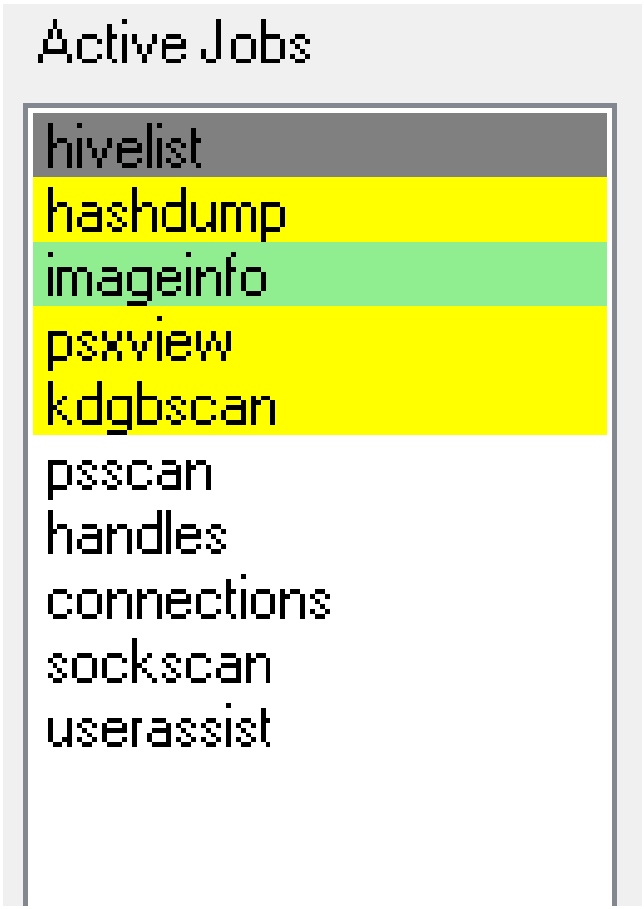


Case examp


Active Jobs
hivelist
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imageinfo
psxview
kdgbscan
psscan
handles
connections
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Case example

Final report of the forensic investigation of a memory image Created with Volix II

Generally

Investigator	Patrick Bock
Date	11.05.2014 21:04:27
Filename	C:\Untersuchungen\Untersuchung_BlackEnergy\be2.vmem\be2.vmem
Checksum	50D9866ADC908508C85517D2D1F55847EC52080B7244C13960A3EF9F4AA98C2A
Comment	This is vey useful information!

Case example

Joblist

Command	imageinfo

Result

```
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```

Note	Date	Name	Text

Case example

Log entrys

Date	Text
11.05.2014 20:03:27	New case created
11.05.2014 20:03:37	hivelist added
11.05.2014 20:03:37	hashdump added
11.05.2014 20:03:37	imageinfo added
11.05.2014 20:11:10	---------- UTC: 11.05.2014 18:11:10 Plugin imageinfo
11.05.2014 20:28:21	Case closed
11.05.2014 20:29:54	Case loaded

Conclusion

Thank you for your attention

VOLIX II is available under

http://www.it-forensik.fh-aachen.de/projekte/volixe

Workshop

RAM-Image:

http://code.google.com/p/volatility/wiki/SampleMemoryImages

VirusTotal:

https://www.virustotal.com/de/