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About this presentation :

- Learning : What is Digital Forensics ?
- Political : Digital Forensics and Open Sources licensing
- Tool time : Digital Forensics Framework

Presented by Solal Jacob core dev. of DFF and CEO @ArxSys

What's Digital Forensics ?

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Forensics : from latin *forensis : forum.* Belonging to, used or adapted to trial or public debate.

Usage of Science or technologies during an investigation in order to establish evidences that can be receivable in a court.

When use it

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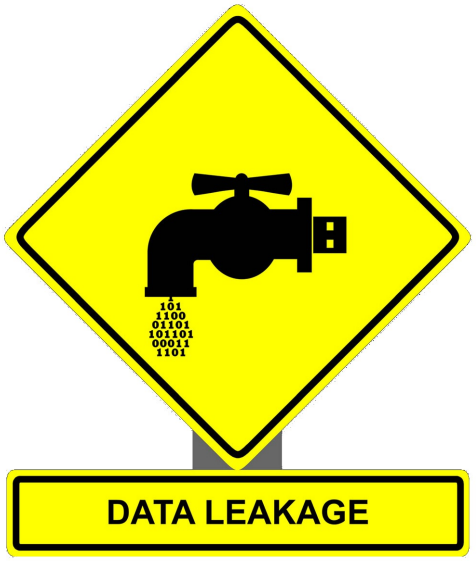

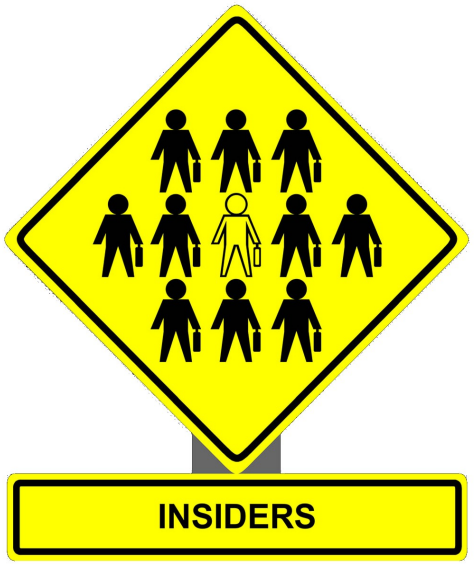

Who use it ?

CERT

Law Enforcement

Expert

Student

The goal

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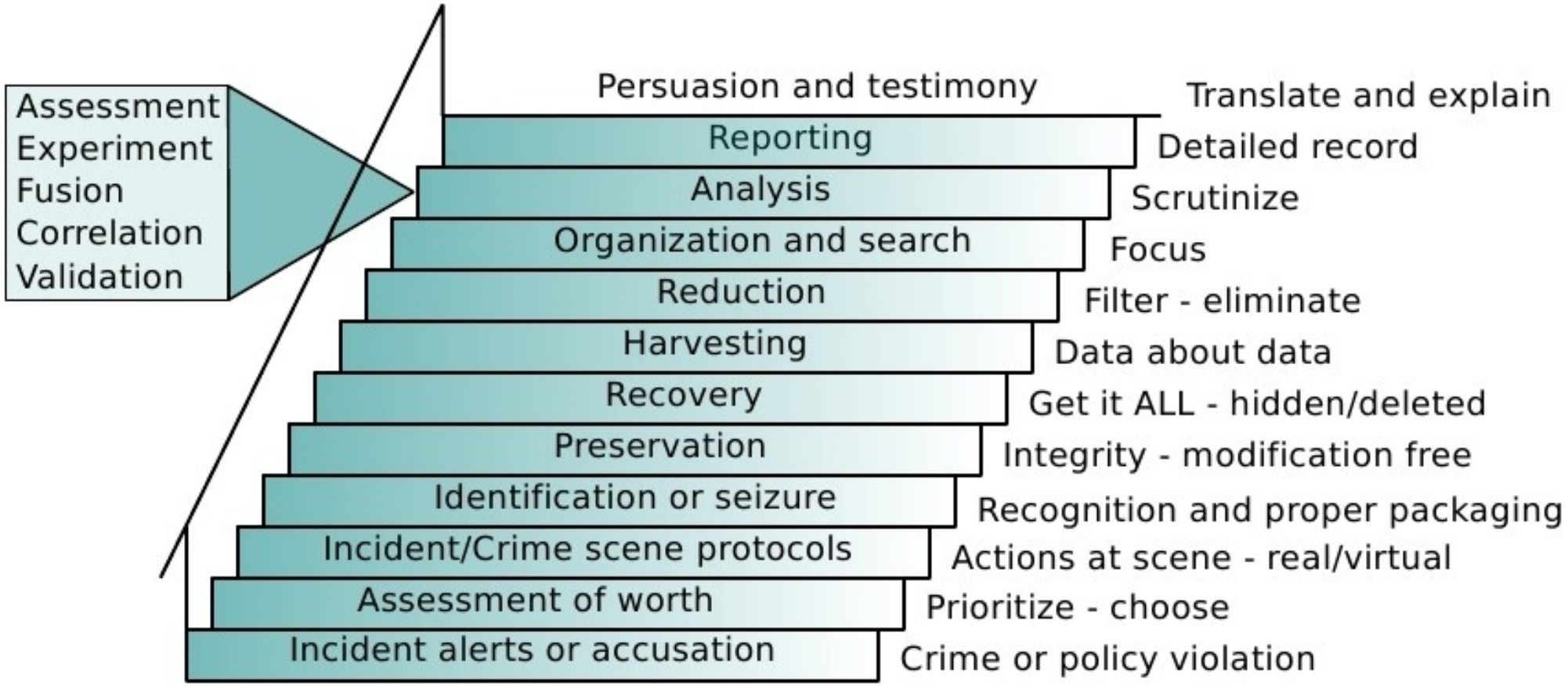
Processes

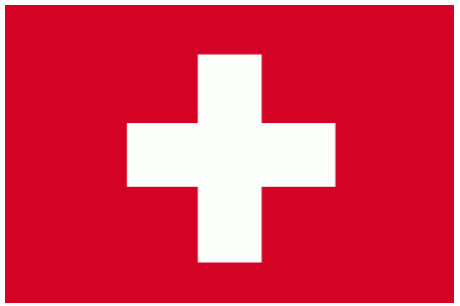


Mostly:

Identification → Acquisition → Analysis → Reporting

Reliability of evidence

Traceability



Neutrality

Software evolution

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- **1982**
  - Norton Utilities (undelete)
- **1995**
  - X-Ways WinHex
- **1997**
  - Guidance Software rachète ASR Expert Witness
  - Encase
- **2001**
  - Access Data Forensic Tool Kit

Software evolution

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- 1999 · TCT (Dan Farmer & Wietse Venema)
- 2001 · TCT devient SleuthKit (Brian Carrier)
- 2005 · PyFlag (Michael Cohen)
- 2007 · Digital Forensics Framework (ArxSys)

Software evolution : Sum up

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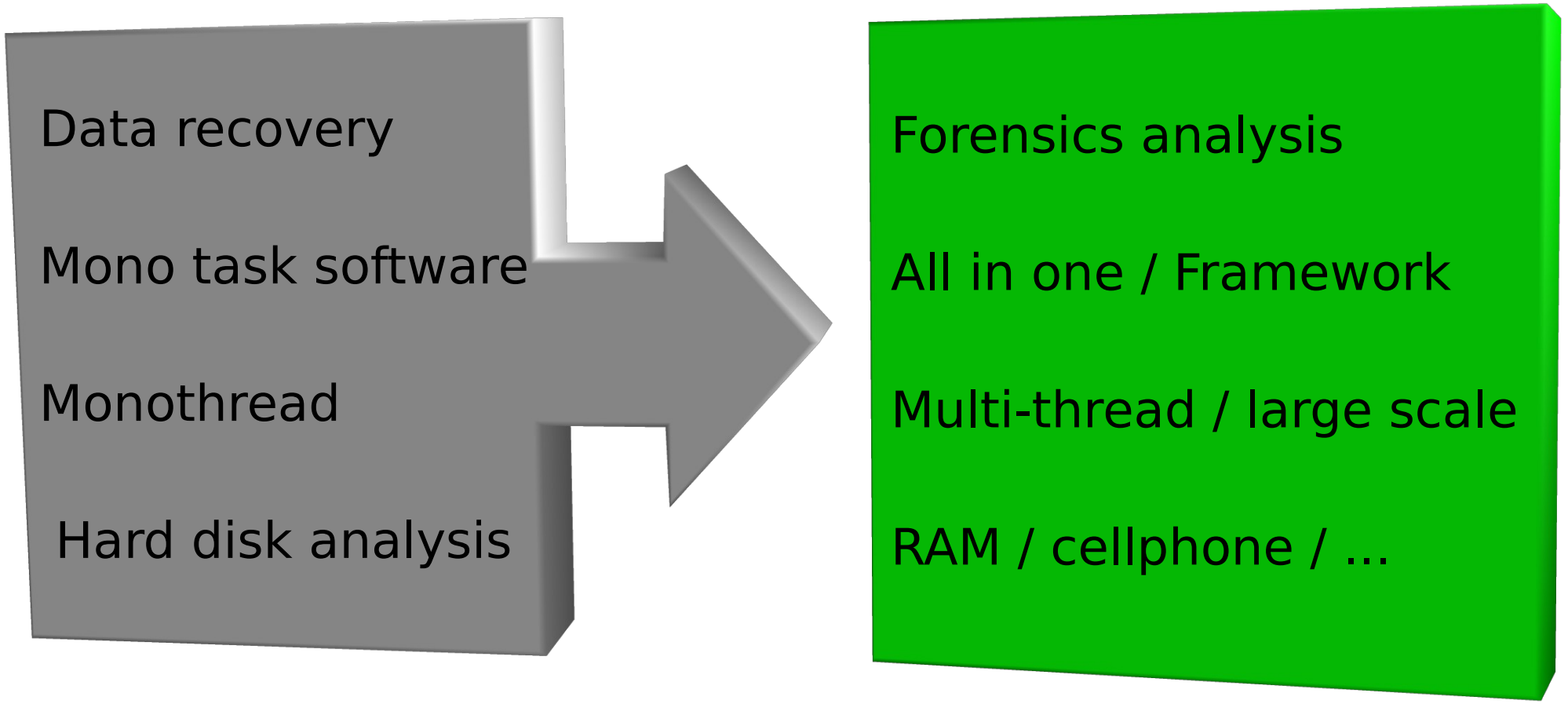
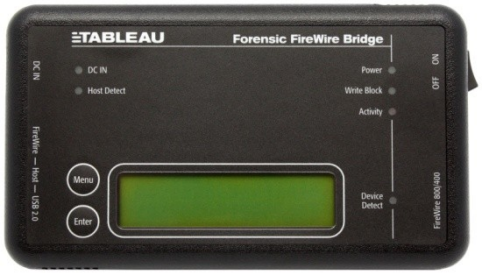


Hardware (Acquisition)



Open Source Digital Forensics

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Open source digital forensics

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Misconception : Criminal have access to source code so they can protect themselves more easily.

Open source digital forensics

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Misconception : Criminal have access to source code so they can protect themselves more easily.

Black Hat 2007 :

Breaking Forensics Software: Weaknesses in Critical Evidence Collection' (ISSEC Partners).

Usage of fuzzing to exploit software bugs.

'The software and methods for testing the quality of forensic software should be public.'

Open source digital forensics

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Misconception : Criminal have access to source code so they can protect themselves more easily.

All of the closed source tools use some open-source code (LGPL, BSD, GPL ?), to handle outlook format, OCR, ...

Open source digital forensics

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Problem : Closed source software are admissible in court (in USA) not open-source one.

Open source digital forensics

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Problem : Closed source software are admissible in court (in USA) not open-source ones

Frye VS the United States

The court had to decide the admissibility of a polygraph test as evidence.

“Testimony given by an expert must have a scientific basis that is established and accepted”

Open source digital forensics

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Problem : Closed source software are admissible in court (in USA) not open-source one

Daubert v. Merrell Dow Pharmaceuticals in 1993

- Has the scientific theory or technique been empirically tested; or, is it falsifiable
- Has the theory or technique been subjected to peer review and publication?
- What is the known or potential error rate?
- Is the theory or technique generally accepted within the relevant scientific community?

Tool time

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DFF

digital forensics framework

In

No

You can

It

Tool time

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DFF

digital forensics framework

In

No

You can

It

Digital Forensics Framework

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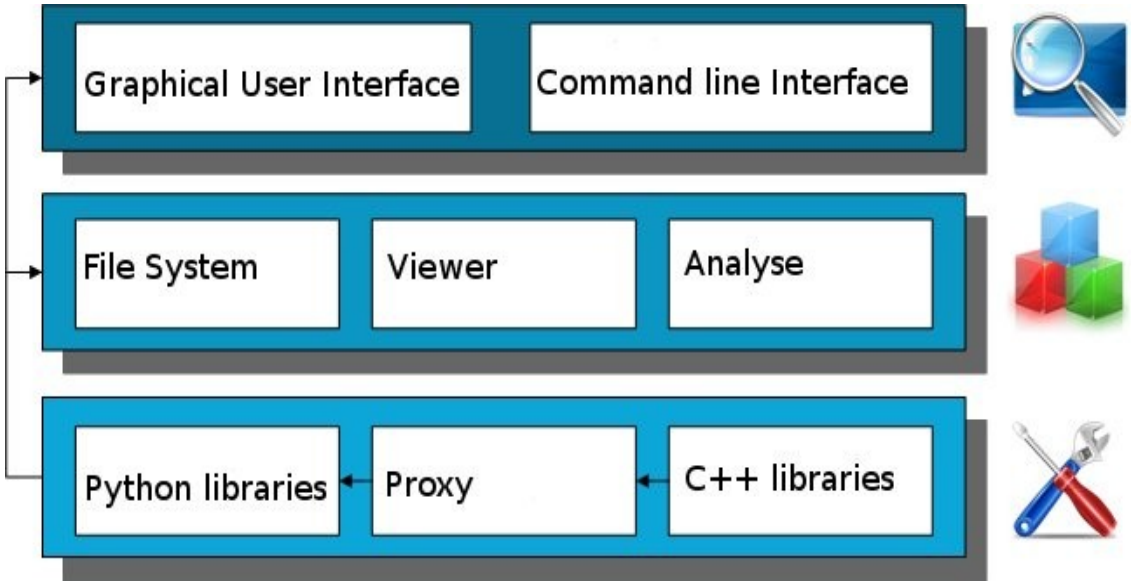

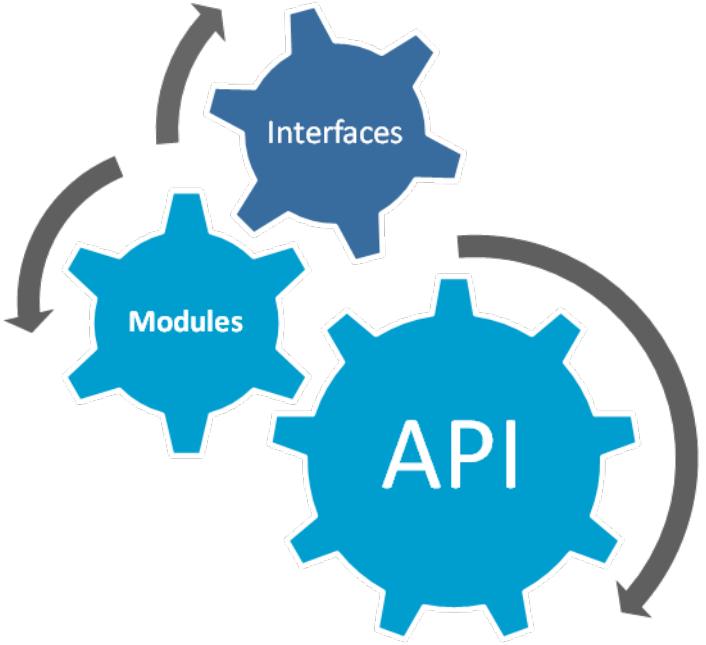

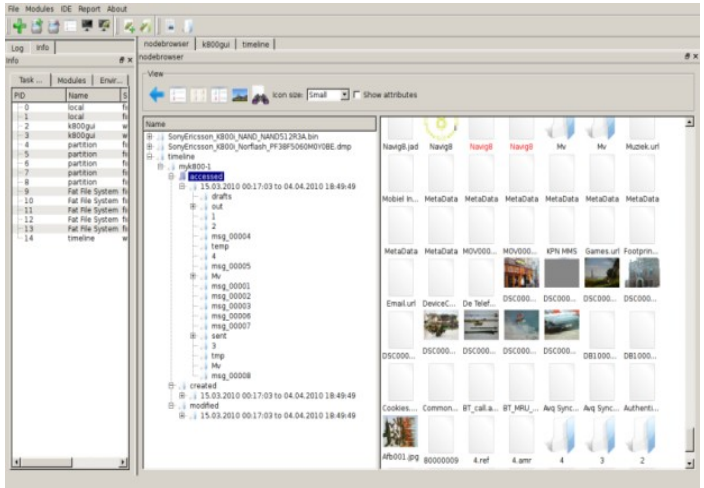

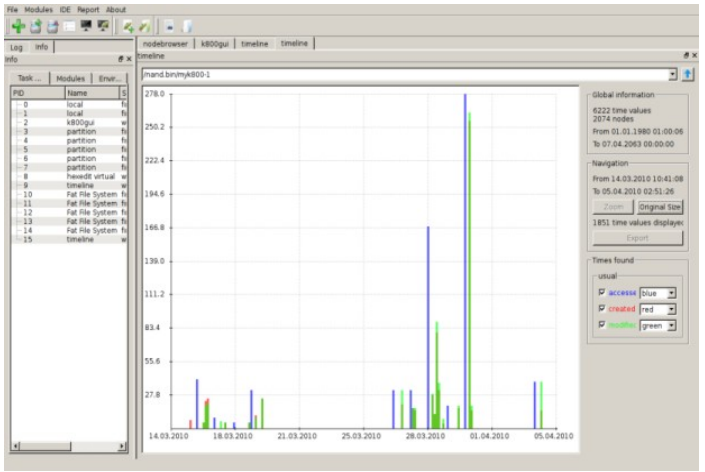

```
dff / >
information     : fileinfo      statistics
search          : carver        find
builtins        : load          cd              show_cwd        show_db         ls
help            : man
viewer          : hexedit       player          viewerimage     bindiff         cat
parser          : volatility
shared memory   : touch         shm
crypto          : unxor
mobile          : smsdecode
file system     : local         partition       fatfs
hash            : hash          hdatabase
process         : extract       post_process    eval            batch
Integrity       : integrity
archive         : unzip
dff / >
```

DFF : Software component

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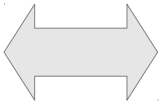

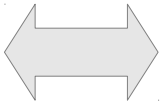

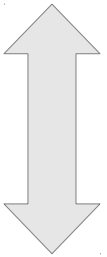

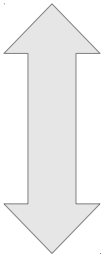

DFF : API Libraries

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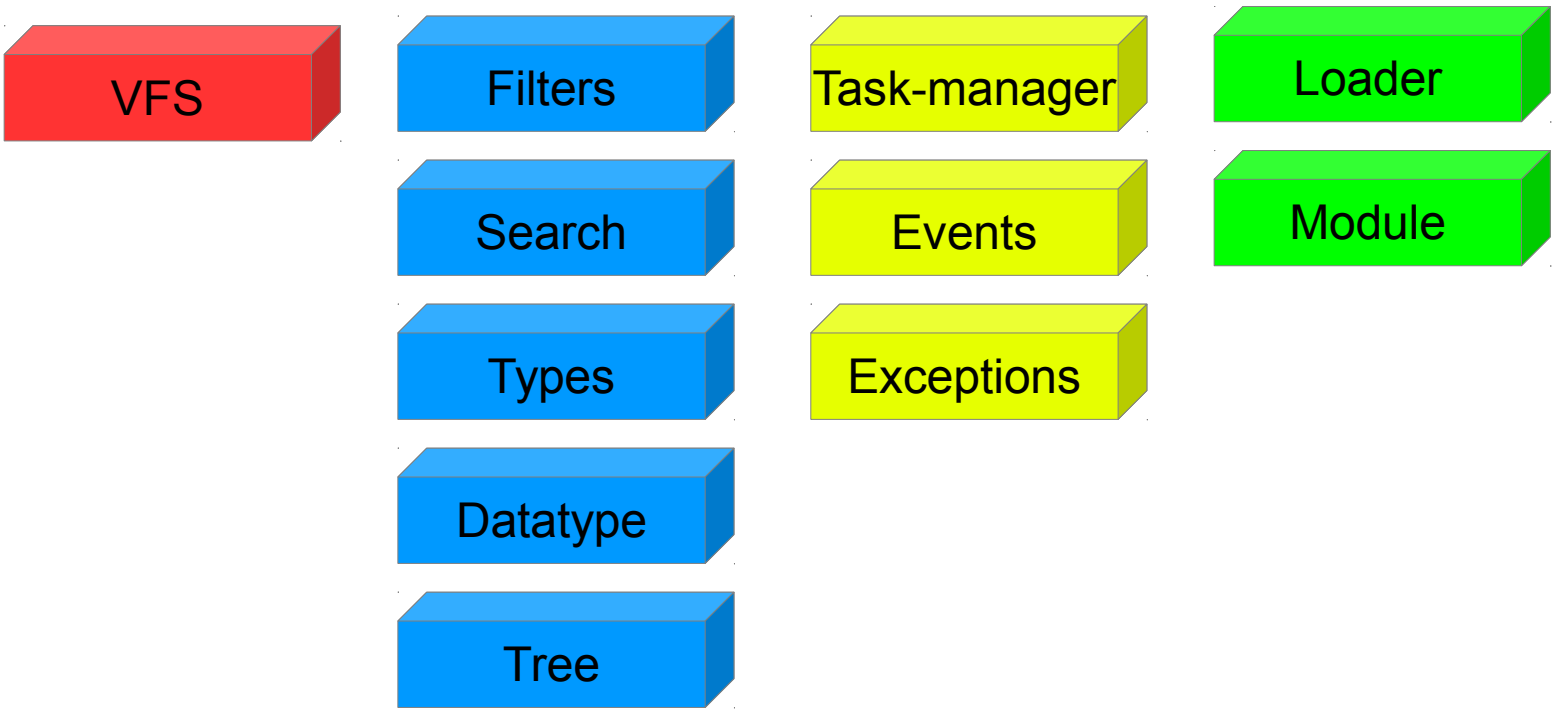

DFF : Modules Tags

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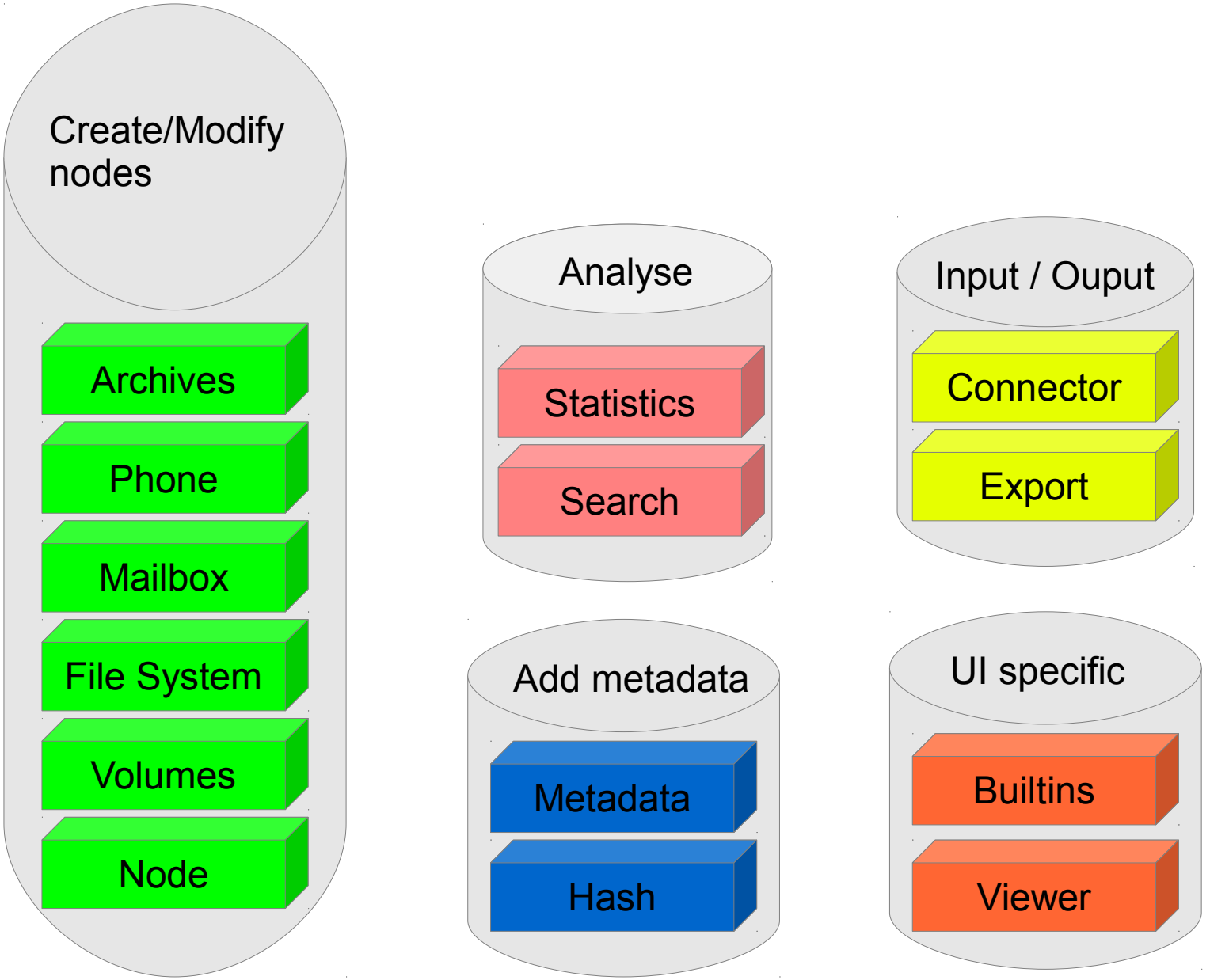

DFF : Module execution

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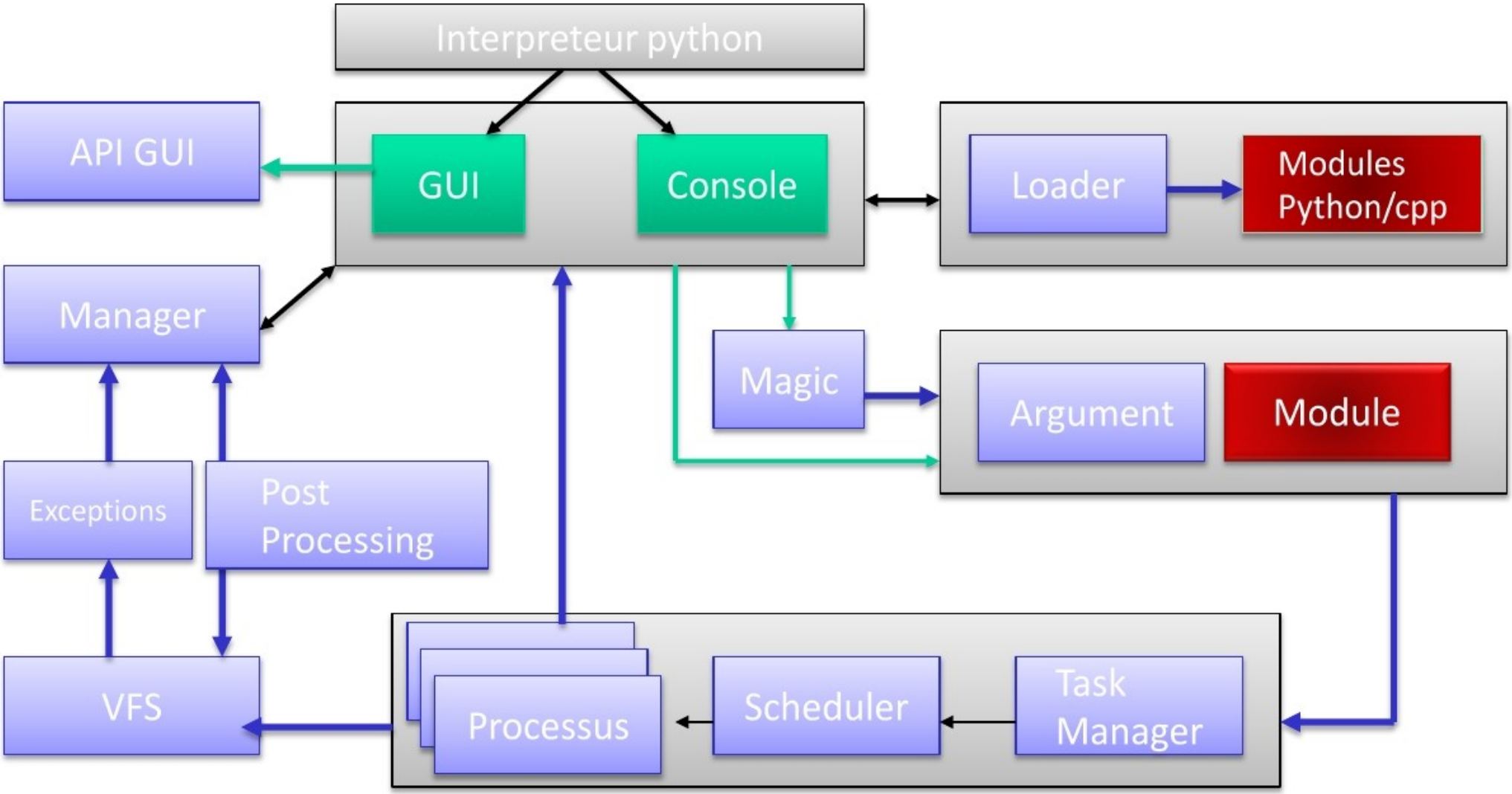
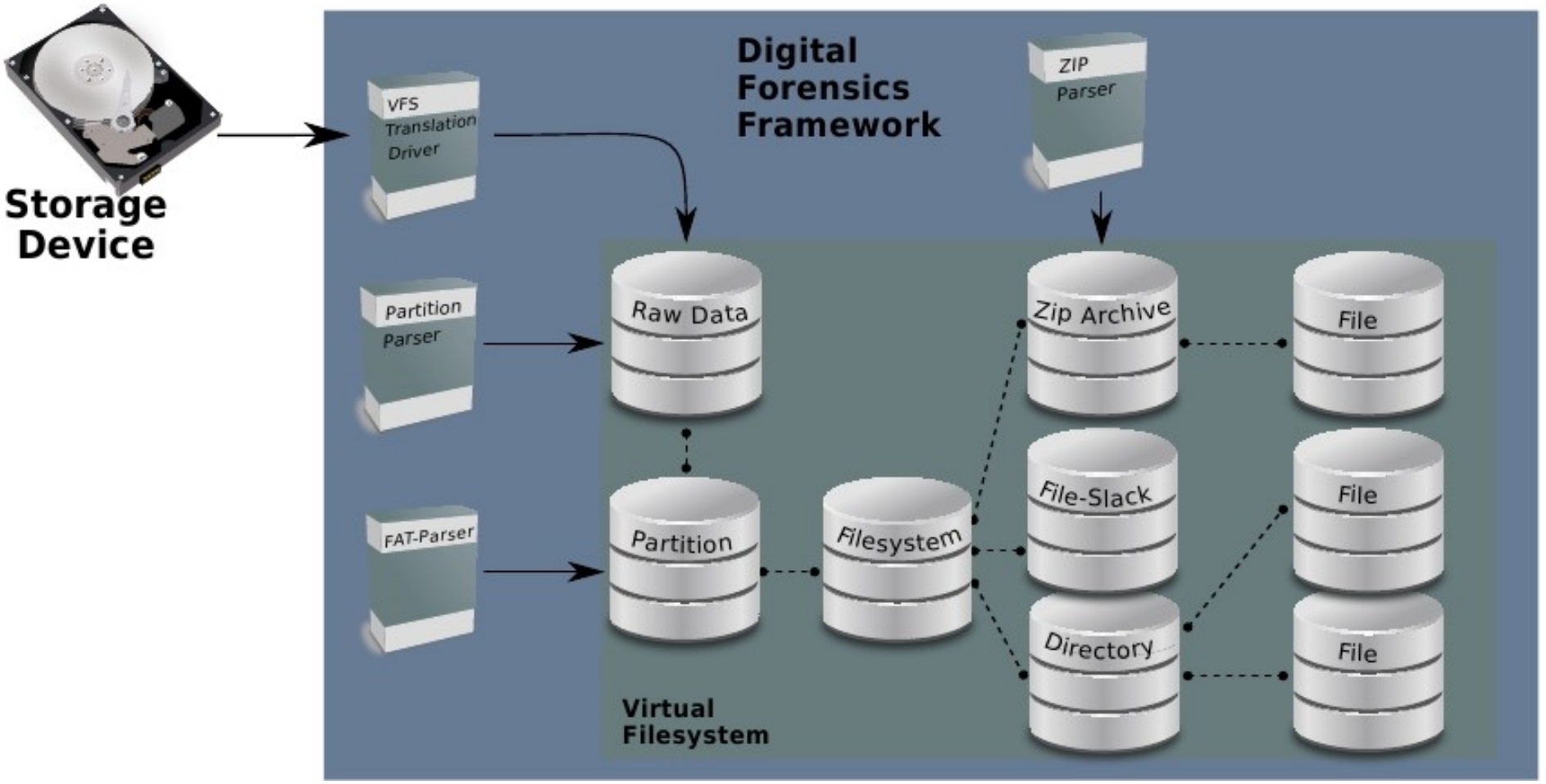
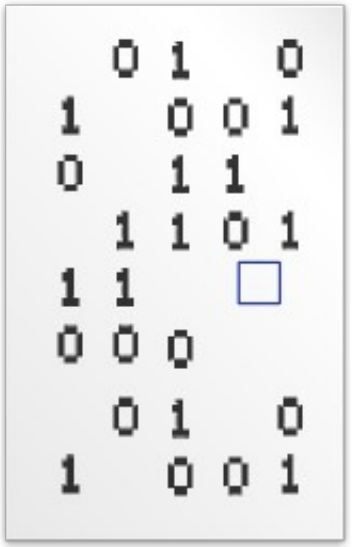


DFF API : Stacked VFS



DFF : Virtual Mapping

dump.dd



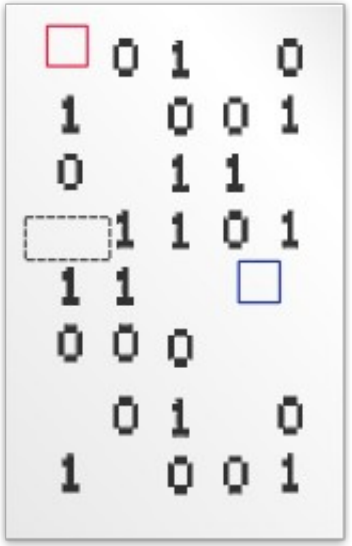
foo.bar

1) push(0, 512, dump.dd, 12348745)

DFF : Virtual Mapping

ArxSys

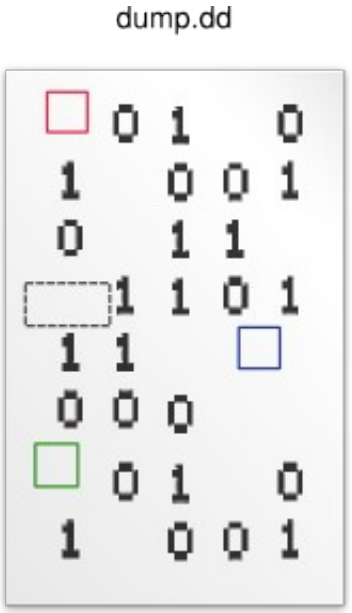
dump.dd



foo.bar

1) push(0, 512, dump.dd, 12348745)
2) push(512, 512, dump.dd, 10240)

DFF : Virtual Mapping



1) push(0, 512, dump.dd, 12348745)

2) push(512, 512, dump.dd, 10240)

N) push(1310720, 42, dump.dd, 4965478)

End

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Don't forget tomorrow there is a two hours workshop :
“Being an investigator” : solving a digital crime with DFF
(14h00 / 2 A.M. / 0xe @ H211)

Please install DFF 1.3 before coming
(Not all modules are needed if it can run it's ok :)

Web site : http://www.digital-forensic.org
IRC : #digital-forensic / freenode

Tracker : http://tracker.digital-forensic.org
Wiki : http://wiki.digital-forensic.org
Git : http://git.digital-forensic.org

Professional Support : http://www.arxsys.fr