Eina Debug & Clouseau

EFL Dev Day 2017 @Malta

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Introduction

- Eina Debug:
  - Communication channel between an EFL debugger and an EFL application
  - Internal features: EvLog, Backtrace, CPU…
  - Supports dynamic opcodes registrations
- Clouseau: EFL debugger

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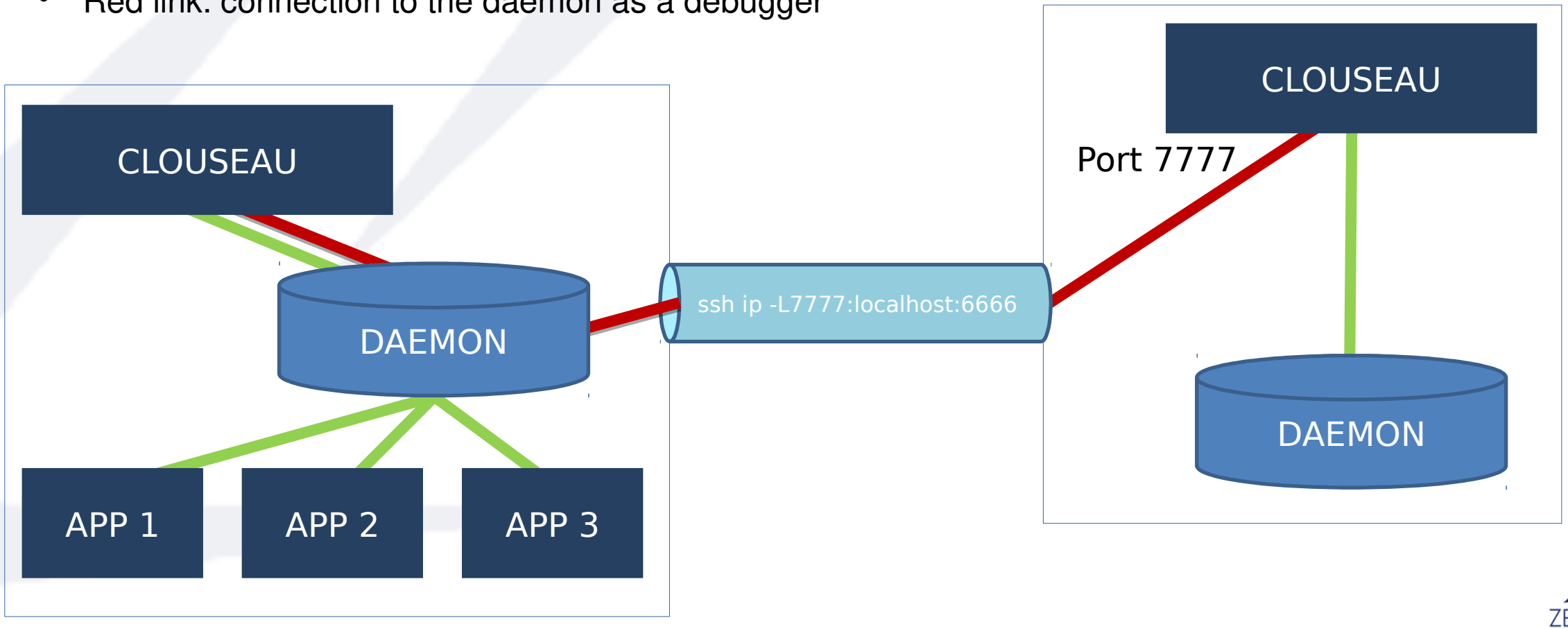
How it works?

- Green link: connection to the daemon as an normal application
- Red link: connection to the daemon as a debugger



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Connection establishment

- Launch efl_debugd (EFL daemon)
- Launch the application to debug
- In case Clouseau is not launched in the target, create a connection to the target with port forwarding, e.g:

  ssh 10.x.x.x -L7777:127.0.0.1:6666

  sdb forward tcp:7777 tcp:6666

- Launch Clouseau:

  With -l option to connect to the local daemon

  With -r *port* to connect remotely (7777 in our previous example)

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Rules of the game

- The daemon must run before the app is launched
- If the connection drops, the app must be restarted to establish a new connection with the daemon
- The apps and the daemon communicate via a UNIX socket
- The debuggers connect via a TCP port to the daemon. For a remote connection, an external tunneling (ssh, sdb…) is needed.
- eW era elttil naidne!

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Hello!

- The client sends automatically to the daemon:

  protocol version / pid / application name

- Debuggers can register to get update on addition/deletion of applications
- When a new application says hello, the daemon updates the debuggers:

  client id / pid / application name

- When a new debugger connects, the daemon sends all the applications information

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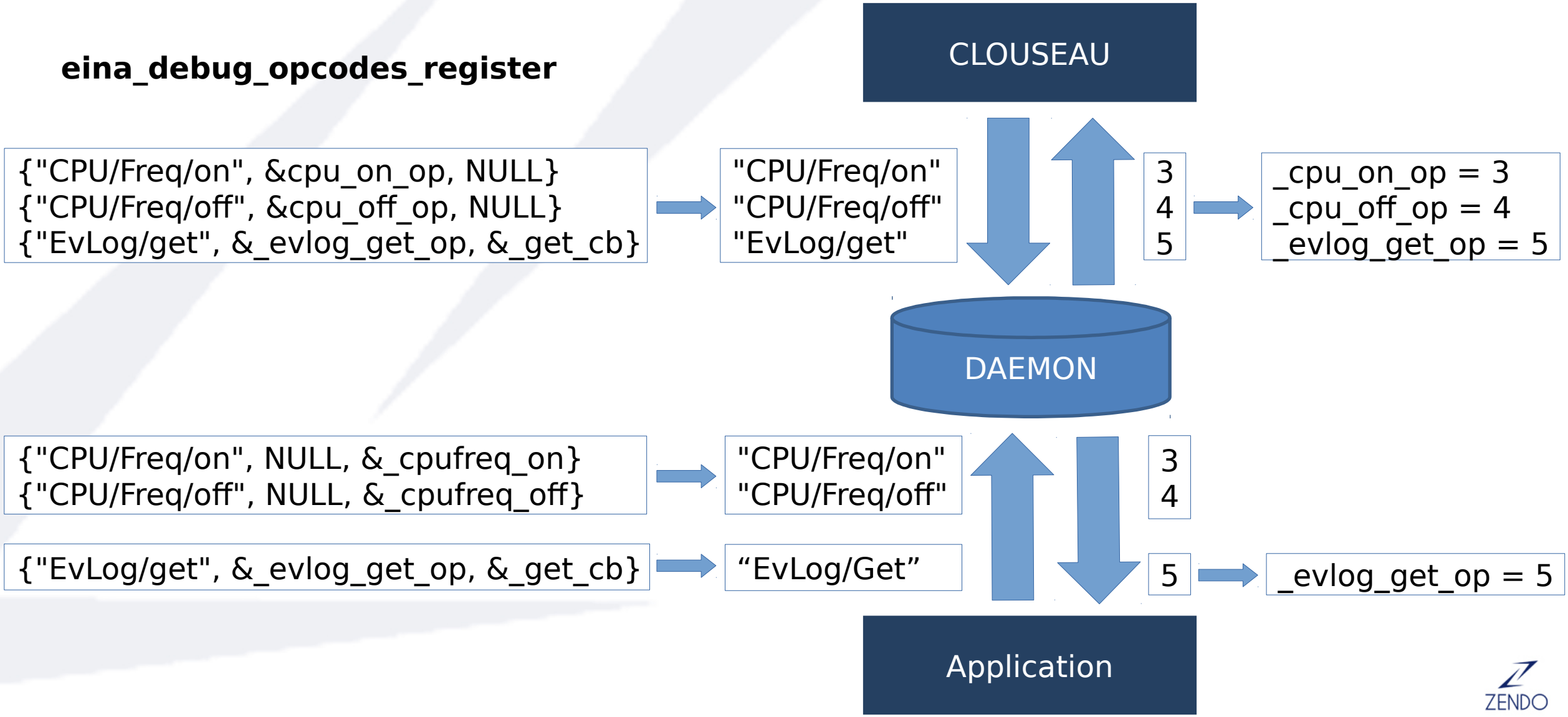
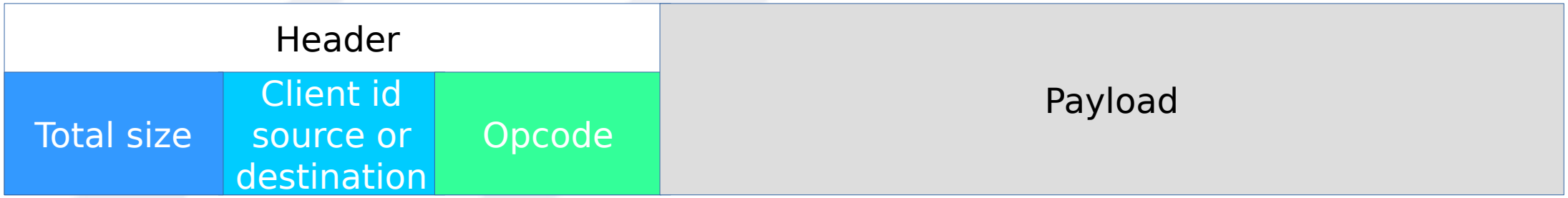
Opcodes registration

eina_debug_opcodes_register



Packet header and dispatching



Opcode	Op string	Callback
3	CPU/Freq/on	_cpufreq_on
4	CPU/Freq/off	_cpufreq_off
5	EvLog/get	_evlog_get

Add new operations

- At anytime, opcodes can be registered via the function eina_debug_opcodes_register:
  - Session: if NULL, will use the default connection to the daemon
  - The opcodes, in this format:

```
EINA_DEBUG_OPCODES_ARRAY_DEFINE(_OPS,
        {"Domain/Feature/action", &opcode, &_op_cb},
        {NULL, NULL, NULL}
);
```

  - A function to call when the opcodes have been received by the daemon

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Requests handling

- Callback prototype:

```
Eina_Bool (*)(Eina_Debug_Session *session, int srcid, void *payload, int payload_size);
```

- It is the responsibility of the developer to extract the payload correctly (including endianness)
- If a response is required, the function eina_debug_session_send can be used to send a response to the requester

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Clouseau

- Full rewriting of the application
- Includes the main features of the first Clouseau
- Extensions
- Snapshot new mechanism

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Clouseau extensions

- WTF is that??!?!?!?
- Two extensions are sitting by default inside Clouseau repository:
  - Objects introspection:
    - Displays a tree of the objects of the application
    - Screenshot can be taken and shown easily
    - Highlighting on focus feature is available
  - EvLog:
    - Allows you to instrument events and timelines
    - Tool initially written by Carsten

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Clouseau: create an extension

- Need to compile as a library
- Mandatory functions:
  - extension_name_get: get the name of the extension
  - extension_start: request to start the extension
  - extension_stop: request to stop the extension

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Clouseau: create an extension - protocol

- Information needed by Clouseau:
  - session_changed: invoked when the session changes
  - app_changed: invoked when the app changes
  - import_data: invoked when the user opened a snapshot file
  - export_data: invoked when the user wants to save a snapshot
  - ui_object: the main object to display on the screen
- Information needed by the extension:
  - session: the current session
  - app_id: the current application id
  - path_to_config: the path to the extensions configuration

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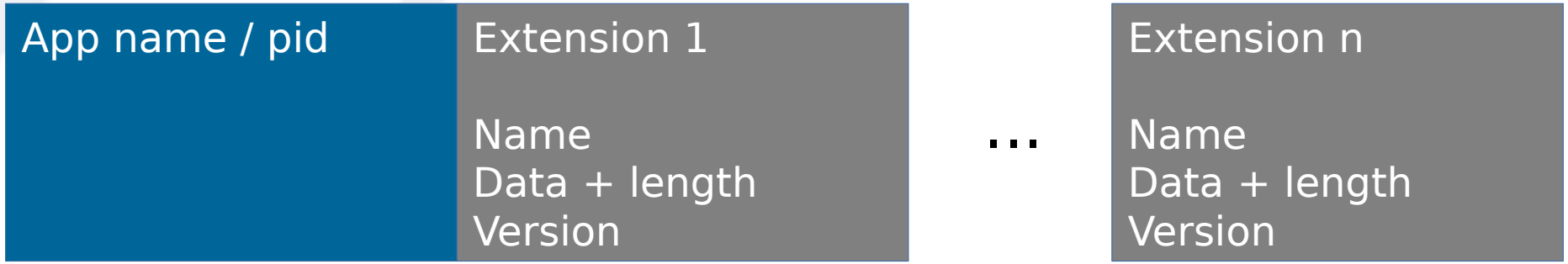
Snapshots

- Supports snapshot of many extensions in one EET file
- Each extension serializes the information into a buffer



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Resources

- Repositories:
  - Eina Debug: core/efl
  - Clouseau: tools/clouseau
- Wiki: https://phab.enlightenment.org/w/eina_debug/

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Demo

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Q & A

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