

Midas Front-End Status

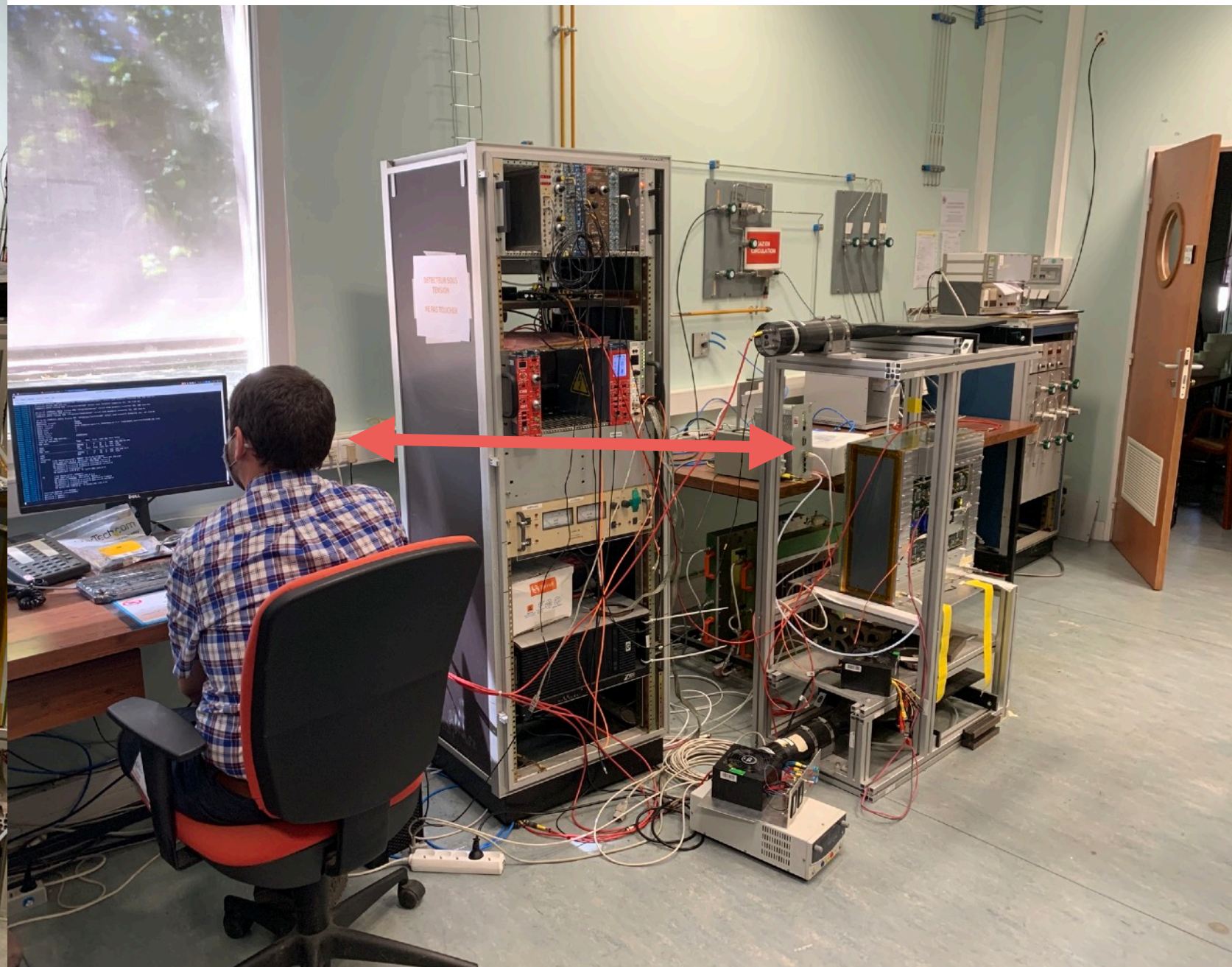
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The 4th of September - 2020

Saclay's Setup



Saclay's Setup



The PClient In a Nutshell

▼ pclient_daq_and_tools

▼ projects

▼ pandax

> bufmgr

> format

▼ mclient

> linux

> winnt

cmdfetcher.c

cmdfetcher.h

evbuilder.c

evbuilder.h

fdecoder.c

fdecoder.h

femarray.c

femarray.h

femproxy.c

femproxy.h

frame_scan.c

frame_scan.h

mclientUDP.c

mreader.c

mreader.h

programflash.c

programflash.h

remotecopy.c

remotecopy.h

> midas

> platforms

> spiflash

> util

This is the pclient executable

It is in charge of the initialisation and the management of the 2 threads that runs in parallel which takes care of the communication with the TDCM.

This is the main loop

It's waiting for the user to type a command or execute a script. This loop will parse each command and decide if it has to be send to the backend or do something internally.

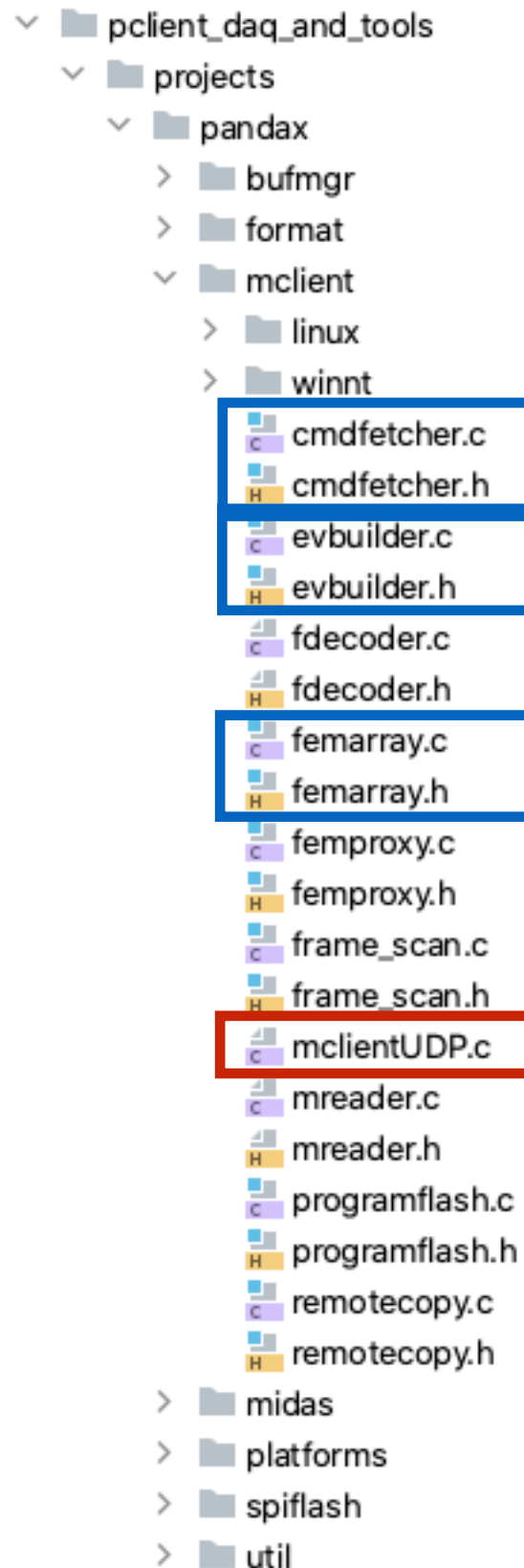
This is the receiver loop

It is in charge of handling the UDP connection with the TDCM: set the size of each frame, attribute credits to the TDCM and fill the received data in the corresponding buffers

This is the event builder loop

Once the data buffer has been filled by the receiver loop, a new iteration of the loop is starting and the data is parsed and written on disk.

The PClient In a Nutshell



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**Has currently
been replaced in
the Midas FE**

**This part has been
left as is**


```

Key name
-----
addr      STRING 1 32 0s 0 RWD 192.168.10.1
port      INT    1  4 0s 0 RWD 1122
HATFEControl.html
feHATClient.html
Starting mserver and mhttpd...
mserver started interactively
Becoming a daemon...
Becoming a daemon...
CMakeCache.txt
CMakeFiles
Makefile
bin
cmake_install.cmake
data
include
install_manifest.txt
lib
libMClient.so
src

Roofit v3.60 -- Developed by Wouter Verkerke and David Kirkby
Copyright (C) 2000-2013 NIKHEF, University of California & Stanford University
All rights reserved, please read http://roofit.sourceforge.net/license.txt

Frontend name      : feHATClient
Event buffer size  : 32768000
User max event size : 16384000
User max frag. size : 24600576
# of events per buffer : 2

Connect to experiment dome-daq...
OK
Init hardware...
13:45:22 INFO feHATClient.cxx:174: Initializing feHATClient...
13:45:22 INFO feHATClient.cxx:176: cwd: /usr/local/t2k/desy-midas-daq/build/bin
13:45:22 DEBUG feHATClient.cxx:178: Setting up TDCMConnector...
13:45:22 DEBUG TDCMConnector.cxx:31: TDCMConnector::reset()
13:45:22 INFO TDCMConnector.cxx:83: Initializing TDCMConnector...
13:45:22 TRACE TDCMConnector.cxx:92: socket_init() returned 0
13:45:22 WARN TDCMConnector.cxx:146: femArray IP: 192.168.10.1:1122
13:45:22 TRACE TDCMConnector.cxx:154: FemArray_Open returned 0
13:45:22 TRACE TDCMConnector.cxx:126: EventBuilder_Open
13:45:22 TRACE TDCMConnector.cxx:133: EventBuilder_Open returned 0
13:45:22 WARN TDCMConnector.cxx:101: Starting FemArray Receive Loop thread...
FemArray_ReceiveLoop: started
13:45:22 WARN TDCMConnector.cxx:110: Starting EventBuilder Loop thread...
13:45:22 INFO TDCMConnector.cxx:121: TDCMConnector has been initialized.
13:45:22 DEBUG feHATClient.cxx:187: Setting up ScriptsManager...
13:45:22 DEBUG feHATClient.cxx:193: Setting up ODB...
13:45:22 INFO feHATClient.cxx:197: feHATClient has been initialized.
OK
    
```

feHATClient	Obaac7ddf28	-	No	Stop feHATClient
-------------	-------------	---	----	------------------

```

*****
Callback routines for system transitions

These routines are called whenever a system transition like start/
stop of a run occurs. The routines are called on the following
occasions:

frontend_init: When the frontend program is started. This routine
                should initialize the hardware.

frontend_exit: When the frontend program is shut down. Can be use
                to releas any locked resources like memory, commu-
                nications ports etc.

begin_of_run:  When a new run is started. Clear scalers, open
                run gates, etc.






end_of_run:    Called on a request to stop a run. Can send
                end-of-run event and close run gates.

pause_run:     When a run is paused. Should disable trigger event

resume_run:    When a run is resumed. Should enable trigger event

*****

121 INT frontend_init();
122 INT frontend_exit();
123 INT begin_of_run(INT run_number, char *error);
124 INT end_of_run(INT run_number, char *error);
125 INT pause_run(INT run_number, char *error);
126 INT resume_run(INT run_number, char *error);
127 INT frontend_loop();
128 INT read_tdcn_event(char *pevent, INT off);
129 INT read_pulser_event(char *pevent, INT off);
130
131 /*-- Bank definitions -----
132
    
```


Status	
feHATClient status:	
<input type="button" value="Run Cold Start Init"/>	
<input type="button" value="Run Pedestals"/>	
<input type="button" value="Run Link Test"/>	
Run number:	ODB key "/Runinfo/Run number" not found
Last run start:	Tue Sep 09 15:04:42 1997
Last run stop:	Tue Sep 09 15:04:42 1997
TDCM0 Target Adress:	192.168.10.1
TDCM0 Target Port:	1122
Check box:	<input type="checkbox"/>
/Equipment/TPCFE00/Common/Enabled:	


```
Terminal - t2kt@dedippcc96: ~/Documents/GitLab/desy-midas-daq
Affichage Terminal Onglets Aide

e_1 | 14:54:18 DEBUG ScriptsManager.cxx:142: Cmd : "NEXT"
e_1 | 14:54:18 DEBUG ScriptsManager.cxx:142: Cmd : "DAQ"
e_1 | 0 DAQ: collected 0 B (0 bytes 1000000000000 bytes left) speed: 0.00 MB/s
e_1 | 14:54:18 DEBUG ScriptsManager.cxx:142: Cmd : "sleep 1"
e_1 | 14:54:19 DEBUG ScriptsManager.cxx:142: Cmd : "NEXT"
e_1 | 14:54:19 DEBUG ScriptsManager.cxx:142: Cmd : "DAQ"
e_1 | 0 DAQ: collected 0 B (0 bytes 1000000000000 bytes left) speed: 0.00 MB/s
e_1 | 14:54:19 DEBUG ScriptsManager.cxx:142: Cmd : "sleep 1"
e_1 | 14:54:20 DEBUG ScriptsManager.cxx:142: Cmd : "NEXT"
e_1 | 14:54:20 DEBUG ScriptsManager.cxx:142: Cmd : "DAQ"
e_1 | 0 DAQ: collected 0 B (0 bytes 1000000000000 bytes left) speed: 0.00 MB/s
e_1 | 14:54:20 DEBUG ScriptsManager.cxx:142: Cmd : "sleep 1"
e_1 | 14:54:21 DEBUG ScriptsManager.cxx:142: Cmd : "NEXT"
e_1 | 14:54:21 DEBUG ScriptsManager.cxx:142: Cmd : "DAQ"
e_1 | 0 DAQ: collected 0 B (0 bytes 1000000000000 bytes left) speed: 0.00 MB/s
e_1 | 14:54:21 DEBUG ScriptsManager.cxx:142: Cmd : "sleep 1"
e_1 | END RECEIVE
e_1 | RELEASE SEMAPHORE
e_1 | RECEIVE LOOP
e_1 | Wait for any of these sockets to be ready
e_1 | EventBuilder Loop: new loop
e_1 | > EVENTBUILDER LOOP
e_1 | 14:54:22 DEBUG ScriptsManager.cxx:142: Cmd : "NEXT"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#####"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "# Stop trigger"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#####"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#be trig_ena 0"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#####"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "# Flush any remaining data left"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#####"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#sleep 2"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#DAQ 1000000000"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#sleep 1"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#DAQ"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#####"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "# Close file if data were saved"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#####"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: "#fclose"
e_1 | 14:54:22 TRACE ScriptsManager.cxx:138: Skip: ""
e_1 | Running 1
e_1 | END RECEIVE
e_1 | RELEASE SEMAPHORE
e_1 | RECEIVE LOOP
e_1 | Wait for any of these sockets to be ready
```


Midas FE: Debugging

```
midas_hatfe_1 Card 00 Chip 00 Channel 69 Mean/Std_dev : 334.93 8.20
midas_hatfe_1 Card 00 Chip 00 Channel 70 Mean/Std_dev : 310.59 7.87
midas_hatfe_1 Card 00 Chip 00 Channel 71 Mean/Std_dev : 330.87 7.51
midas_hatfe_1 Card 00 Chip 00 Channel 72 Mean/Std_dev : 319.88 7.82
midas_hatfe_1 Card 00 Chip 00 Channel 73 Mean/Std_dev : 314.44 8.01
midas_hatfe_1 Card 00 Chip 00 Channel 74 Mean/Std_dev : 349.30 7.97
midas_hatfe_1 Card 00 Chip 00 Channel 75 Mean/Std_dev : 362.86 7.46
midas_hatfe_1 Card 00 Chip 00 Channel 76 Mean/Std_dev : 309.55 7.62
midas_hatfe_1 Card 00 Chip 00 Channel 77 Mean/Std_dev : 356.72 7.59
midas_hatfe_1 Card 00 Chip 00 Channel 78 Mean/Std_dev : 348.63 7.73
midas_hatfe_1 ----- End of Frame -----
midas_hatfe_1 RECEIVE LOOP
midas_hatfe_1 13:42:27 DEBUG ScriptsManager.cxx:142: Cmd : "END"
midas_hatfe_1 *** Break *** segmentation violation
midas_hatfe_1 [feHATClient,ERROR] [midas.cxx:2041:cm_check_connect,ERROR]
midas_hatfe_1 periment not called at end of program
midas_hatfe_1 ^CGracefully stopping... (press Ctrl+C again to force)
midas_hatfe_1 Stopping desymidasdaq_midas_hatfe_1 ... done
midas_hatfe_1 t2kt@dedippcc96:~/Documents/GitLab/desy-midas-daq$
```

```
// Get the size of the buffer
fr = (unsigned short *) buf;
len = (int) (*fr);

else if (Frame_IsMFrame((void *)fr))
{
    //printf("EventBuilder_Loop: buffer to recycle is M
}

int Frame_IsDPFrame(void *fr);
int Frame_IsMFrame(void *fr);
int Frame_IsMsgStat(void *fr);

/*****
Frame_IsMFrame
*****/
int Frame_IsMFrame(void *fr)
{
    unsigned short *s;
    s = (unsigned short *)fr;
    s++;

    if ((*s & PFX_9_BIT_CONTENT_MASK) == PFX_START_OF_MFRAME)
    {
        return(1);
    }
    else
    {
        return(0);
    }
}
```



```

Terminal - t2kt@dedippcc96: ~/Documents/GitLab/desy-midas-daq
Édition  Affichage  Terminal  Onglets  Aide

s_hatfe_1 | fe thr 15 31 0x0123 ( 291)
s_hatfe_1 | fe thr 15 32 0x0123 ( 291)
s_hatfe_1 | fe thr 15 33 0x0124 ( 292)
s_hatfe_1 | fe thr 15 34 0x0122 ( 290)
s_hatfe_1 | fe thr 15 35 0x0123 ( 291)
s_hatfe_1 | fe thr 15 36 0x0125 ( 293)
s_hatfe_1 | fe thr 15 37 0x0124 ( 292)
s_hatfe_1 | fe thr 15 38 0x0124 ( 292)
s_hatfe_1 | fe thr 15 39 0x0123 ( 291)
s_hatfe_1 | fe thr 15 40 0x0122 ( 290)
s_hatfe_1 | fe thr 15 41 0x0123 ( 291)
s_hatfe_1 | fe thr 15 42 0x0121 ( 289)
s_hatfe_1 | fe thr 15 43 0x0122 ( 290)
s_hatfe_1 | fe thr 15 44 0x0124 ( 292)
s_hatfe_1 | fe thr 15 45 0x0125 ( 293)
s_hatfe_1 | fe thr 15 46 0x0124 ( 292)
s_hatfe_1 | fe thr 15 47 0x0124 ( 292)
s_hatfe_1 | fe thr 15 48 0x0125 ( 293)
s_hatfe_1 | fe thr 15 49 0x0125 ( 293)
s_hatfe_1 | fe thr 15 50 0x0122 ( 290)
s_hatfe_1 | fe thr 15 51 0x0122 ( 290)
s_hatfe_1 | fe thr 15 52 0x0124 ( 292)
s_hatfe_1 | fe thr 15 53 0x0102 ( 258)
s_hatfe_1 | fe thr 15 54 0x0123 ( 291)
s_hatfe_1 | fe thr 15 55 0x0122 ( 290)
s_hatfe_1 | fe thr 15 56 0x0123 ( 291)
s_hatfe_1 | fe thr 15 57 0x0125 ( 293)
s_hatfe_1 | fe thr 15 58 0x0127 ( 295)
s_hatfe_1 | fe thr 15 59 0x0126 ( 294)
s_hatfe_1 | fe thr 15 60 0x0122 ( 290)
s_hatfe_1 | fe thr 15 61 0x0123 ( 291)
s_hatfe_1 | fe thr 15 62 0x0122 ( 290)
s_hatfe_1 | fe thr 15 63 0x0122 ( 290)
s_hatfe_1 | fe thr 15 64 0x0124 ( 292)
s_hatfe_1 | fe thr 15 65 0x0125 ( 293)
s_hatfe_1 | fe thr 15 66 0x0101 ( 257)
s_hatfe_1 | fe thr 15 67 0x0122 ( 290)
s_hatfe_1 | fe thr 15 68 0x0122 ( 290)
s_hatfe_1 | fe thr 15 69 0x0124 ( 292)
s_hatfe_1 | fe thr 15 70 0x0123 ( 291)
s_hatfe_1 | fe thr 15 71 0x0122 ( 290)
s_hatfe_1 | fe thr 15 72 0x0122 ( 290)
s_hatfe_1 | fe thr 15 73 0x0123 ( 291)
s_hatfe_1 | fe thr 15 74 0x0123 ( 291)
s_hatfe_1 | fe thr 15 75 0x0123 ( 291)
s_hatfe_1 | fe thr 15 76 0x0121 ( 289)
s_hatfe_1 | fe thr 15 77 0x0122 ( 290)
s_hatfe_1 | fe thr 15 78 0x0124 ( 292)
s_hatfe_1 | ----- End of Frame -----
s_hatfe_1 | END RECEIVE
s_hatfe_1 | RELEASE SEMAPHORE

```



```

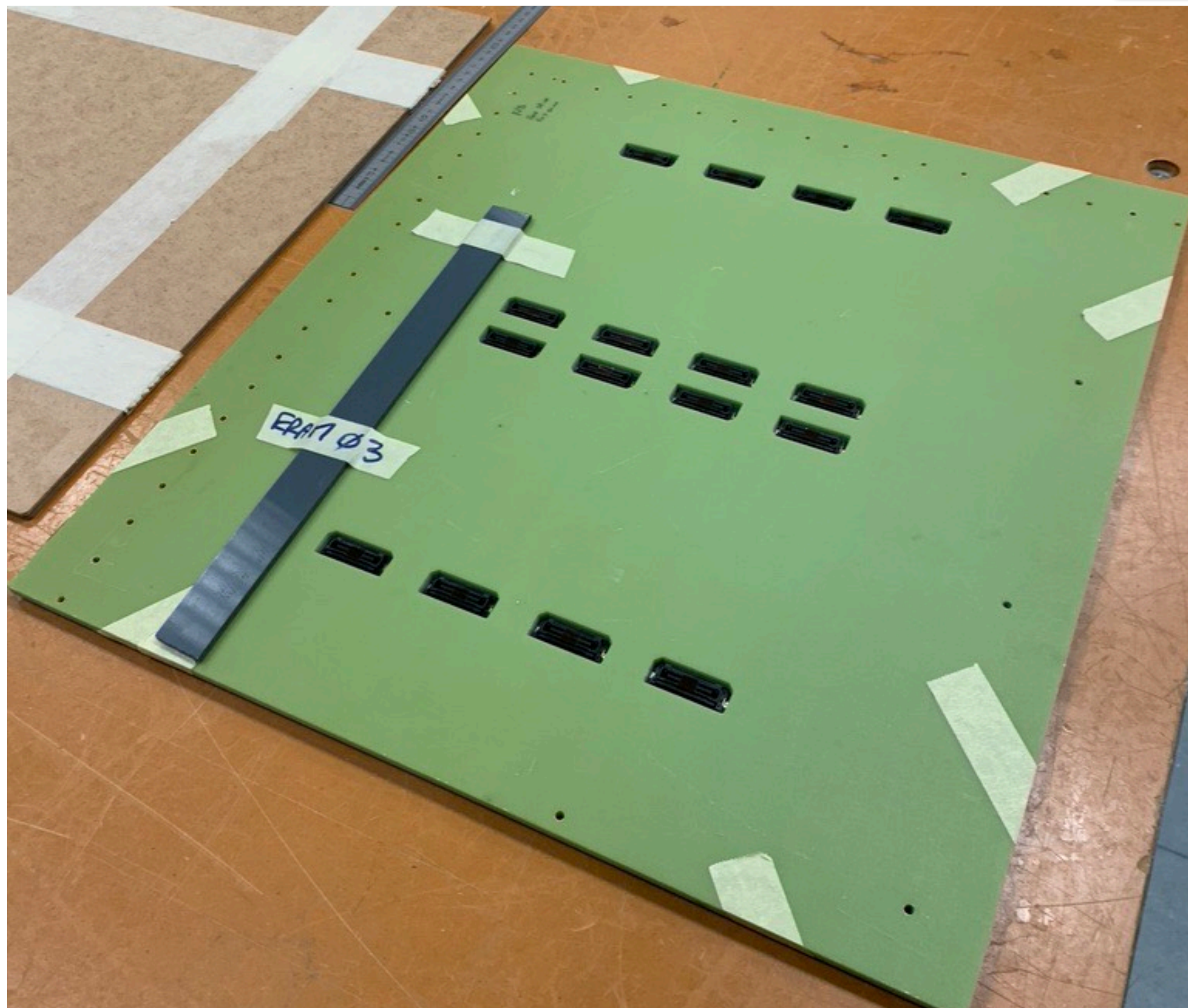
--- Start of Moni Frame (V.0) FE 00 (952 bytes) --
Card 00 Chip 15 Channel 00 Mean/Std_dev : 250.03 8.41
Card 00 Chip 15 Channel 01 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 02 Mean/Std_dev : 391.78 14.12
Card 00 Chip 15 Channel 03 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 04 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 05 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 06 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 07 Mean/Std_dev : 470.38 8.02
Card 00 Chip 15 Channel 08 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 09 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 10 Mean/Std_dev : 504.01 6.27
Card 00 Chip 15 Channel 11 Mean/Std_dev : 484.31 8.14
Card 00 Chip 15 Channel 12 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 13 Mean/Std_dev : 503.49 6.87
Card 00 Chip 15 Channel 14 Mean/Std_dev : 472.00 8.56
Card 00 Chip 15 Channel 15 Mean/Std_dev : 249.42 9.13
Card 00 Chip 15 Channel 16 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 17 Mean/Std_dev : 452.16 7.79
Card 00 Chip 15 Channel 18 Mean/Std_dev : 469.84 8.33
Card 00 Chip 15 Channel 19 Mean/Std_dev : 434.87 7.87
Card 00 Chip 15 Channel 20 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 21 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 22 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 23 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 24 Mean/Std_dev : 458.40 8.22
Card 00 Chip 15 Channel 25 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 26 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 27 Mean/Std_dev : 0.00 0.00
Card 00 Chip 15 Channel 28 Mean/Std_dev : 251.15 0.00
Card 00 Chip 15 Channel 29 Mean/Std_dev : 0.00 0.00

```

We need to parse the received data on the fly

- Check if the pedestals calibration has gone wrong
- Let Midas format the data and get the info it needs to monitor the data taking
- Write ROOT files
- Merge data with other detectors
- Manage data transfert to storage clusters?





Thanks for Listening

