

Procedure

Contents

1	Introduction	1
2	Data format	1
3	bgLink bug	2
4	Client code	3

1 Introduction

This section provides know-how procedures the HARPO team share.

2 Data format

There is one output file by instance of clientUPD (by card).

```
outputFile = fileHeader event{nb-events}
event      = eventHeader areqPaquet{nb-asics}
eventHeader = eventSize eventNumber           [      8 bytes]
areqPacket  = dccPacket{nb-channels}
dccPacket   = payloadSize dccHeader fem data{nb-capas} trailer [ 1044 bytes]
fem         = femHeader args timeH timeL event wordCount      [   16 bytes]
trailer     = align{?} trailerH trailerL           [    4 bytes]

fileHeader  = RYYYY.MM.DD-HH:MM                  [   20 bytes]

eventSize   = 4 bytes (see computation above)
eventNumber = 4 bytes

payloadSize = 2 bytes (usually 0x0414 = 1044)
dccHeader   = 2 bytes (usually 0x4000, seen at 0x5000)

femHeader   = 2 bytes (from 0x0000 to 0x000f)
args        = 2 bytes (from 0x0012 to 0x01D4 by step of 6: 2,8,e,4,a,0,6,c)
timeH       = 2 bytes
timeL       = 2 bytes
event       = 2 bytes
wordCount   = 2 bytes (usually 0x0200 = 512: same as nb-capas I guess)

data        = 2 bytes

align       = 2 bytes (0x0000)
trailerH    = 2 bytes (0x0000)
trailerL    = 2 bytes (0x0000)
```

exemple:

```
00000000: 5232 3031 312e 3130 2e31 332d 3133 3a33  R2011.10.13-13:3
00000010: 363a 3437-0004 d7c8 0000 0001-0414 4000  6:47.....@.
```

```

00000020: 000d 0012 0003 f092 c95d 0200-0159 0147 .....]...Y.G
...
00000420: 014a 0148 014a 014b 0150 010a-0000 0000- .J.H.J.K.P.....
00000430: 0414 4000 000e 0018 0003 f092 c95d 0200 ..@.....]..
00000440: 0139 011d 011a 010f 0116 0117 011d 011a .9.....

```

- We can compute nb-capas looking at the upper exemple:
 $0x42c - 0x2c = 0x400 \Rightarrow 512$ words of data
- dccPacket size should be:
 $\text{sizeof}(\text{dccPacket}) = 16 + (\text{nb-capas} * 2) + (4 \text{ or } 5)$
note: maybe sometime one «align» 0x0000 word is added. In fact even if we have 3 consecutive 0x0000 words, the dccPacket size do not looks to change so I guess the last capa value is in fact 0x0000 (but strange).
- areqPacket size should be:
 $\text{sizeof}(\text{areqPacket}) = \text{sizeof}(\text{dccPacket}) * \text{nb-channels}$
- event size should be:
 $\text{sizeof}(\text{event}) = 8 + (\text{sizeof}(\text{areqPacket}) * \text{nb-asics})$
- Global file size should be:
 $\text{sizeof}(\text{outputFile}) = 20 + (\text{sizeof}(\text{event}) * \text{nb-events})$

3 bgLink bug

These 2 files show the following error, resulting in a dccPacket lost:

```

-----
dcc(00): Warning: cmd(27) areq 0 0 0 3 78
failed: -4 Fem(0): Fem_ReceiveData failed

dcc(00).rep(27): -4 Fem(0): Fem_ReceiveData failed
dcc(00).rep(27.4): 1044 bytes of data (expecting 71 more packets)
-----

```

- file YB_10C.DAT

```

0004d7d0:                                [0004 d7c8 .....!.....
0004d7e0: 0000 0002 0414 4000 0006 0012 005c 0f61 .....@.....\a
...
0004e000: 0118 011f 0111 0109 0000 0000 0414 4000 .....@.
0004e010: 0008(001e)005c 0f61 c95e 0200 0134 011f .....\.a.^...4..
...
0004e420: 0414 4000 0009(0024)005c 0f61 c95e 0200 ..@....$.\.a.^..
...
0009afa0: 0000 0000]0004 d7c8 0000 0003 0414 4000 .....@.
0009afb0: 0001 0012 00b3 c8de c95f 0200 015b 0146 ....._...[.F

```

- Size of loop on args from 0x0012 to 0x0012 on event 2 is:
 $0x0009afa4 - 0x0004d7dc = 0x4D7C8 \Rightarrow 317384$

This seems correct (nb-capas=512, nb-channels=76 and nb-asics=4) but only if we do not have align word in the files (in fact we should have last values at 0x0000 but this is strange):

```

1044    <= sizeof(dccPacket)    <= 1045
79344  <= sizeof(areqPacket) <= 79420
317384 <= sizeof(event)        <= 317688

```

- file YB_10B.DAT

```

0004d7d0:                                [0004 d3b4 .....#.....
0004d7e0: 0000 0002 0414 4000 0006 0012 0062 d225 .....@.....b.%
...
0004e000: 011f 0117 0123 010c 0000 0000 0414 4000 .....#.....@.
0004e010: 0008(001e)0062 d225 c954 0200 0137 011e .....b.%.T...7..
...
0004e420: 0414 4000 000a(002a)0062 d225 c954 0200 ..@....*.b.%.T..
...
0009ab90:]0004 d7c8 0000 0003 0414 4000 0000 0012 .....@.....

```

- At 0x0004e420: We jump from args 0x001e to 0x002a while we expected to jump to 0x0024.
- Size of loop on args from 0x0012 to 0x0012 on event 2 is: 0x0009ab90 - 0x0004d7dc = 0x4D3B4 => 316340 (we miss exactly 1044 with above)

4 Client code

Code is here: *harpo@llrharpo: /Partage/harpo/trunk/design/informatique/ClientLLR*
The makefile is here: *ClientLLR/linux/makefile* :

- *ClientLLR/client/clientUDP.c*
- *ClientLLR/gblink/gblink.c* : macro for data packet
- *ClientLLR/util/histo.c* : histogram object
- *ClientLLR/dcc/pedestal_packet.c* : pedestal packet
- *ClientLLR/dcc/ethpacket.c* : DCC -> pc
- *ClientLLR/dcc/endofevent_packet.c* : end of event packet

File included:

```

#include <stdio.h>
#include <time.h>
#include <netinet/in.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <sys/ioctl.h>
#include <sys/uio.h>
#include <unistd.h>
#include <stropts.h> // stream interface
#include <string.h>
#include <errno.h>
#include <sched.h>
#include <math.h>

#include "platforms/linux/platform_spec.h" (nothing special)

#include "util/linux/sock_util.h"
#include "util/timerlib.h"

```

```
#include "util/histo.h"

#include "gblink/gblink.h"
#include "gblink/linux/gblink_ps.h"

#include "fem/after.h"
#include "fem/fem.h"
#include "fem/err_codes.h"
#include "fem/fem_reg.h"
#include "fem/fem_mapping.h"
#include "fem/fem_t2k_map.h"

#include "dcc/dcc.h"
#include "dcc/ethpacket.h"
#include "dcc/endofevent_packet.h"
#include "dcc/busymeter.h"
#include "dcc/pedestal_packet.h"
#include "dcc/bufpool_err.h"

#include "client/midasformat.h"
```