Current status and future developments for the LLRF control server

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Server Minor Changes

- Continuous adjustments of server to new firmware and user requirements

- User requests
  - Change of properties names
  - Move properties between locations
  - Add/remove history for selected properties
  - Small functionality modifications

- Bugfixing
  - Correction of parameters init after server restart
  - Correction of limiters and VS for channels 0 and 9

- Special requests for shift

Server Major Changes

- Run-time configuration of DMA buffers

- Support for mapp files

- Support for FLASH1/FLASH2 with new functionality of timing system

- Update of OVR – not tested yet

Server Major Changes

- New approach to long archiver

- Return to build-in D_spectrum class

- Changelog file added to source code structure

- DRIVER LEVEL: solution for NO DMA INTERRUPT problem

Board/FW Functionality Separation

- Initial assumption
  - One board -> one firmware -> one functionality
  - DMA buffers configuration depends only on board type

- Current requirements
  - One board -> multiple versions of firmware -> multiple functionality
  - DMA buffers configuration depends on firmware functionality

Board/FW Functionality Separation

- Initial assumption
  - One location per board – SIS board, UTC board, TCK7 board, SISL board
  - RTM functionality included into board location

- Current requirements
  - One location per board but only with hardware specific functionality
  - One location per RTM but only with hardware specific functionality
  - High level functionality moved to existing locations

Board/FW Functionality Separation

- DMA buffer configuration moved to run-time and stored into server conf file:
  - eq_fct_info:
    `<PDMA_CH_NR>16</PDMA_CH_NR><SDMA_CH_NR>8</SDMA_CH_NR><PDMA_CH_IN_USE>11</PDMA_CH_IN_USE><SDMA_CH_IN_USE>8</SDMA_CH_IN_USE><PDMA_SAMPLES_PER_CH>16384</PDMA_SAMPLES_PER_CH><SDMA_SAMPLES_PER_CH>147456</SDMA_SAMPLES_PER_CH><PDMA_SCALE_FACTOR>4</PDMA_SCALE_FACTOR><SDMA_SCALE_FACTOR>1</SDMA_SCALE_FACTOR><PDMA_CH_OFFSET>0</PDMA_CH_OFFSET><SDMA_CH_OFFSET>0</SDMA_CH_OFFSET>„`
  - eq_fct_info:
    `"<PZ>OFF</PZ><DMA_SAMPLES_PER_CH>16384</DMA_SAMPLES_PER_CH><PIEZO_SAMPLES_PER_CH>2000</PIEZO_SAMPLES_PER_CH><PIEZO_FF_SAMPLES_PER_CH>1024</PIEZO_FF_SAMPLES_PER_CH>"`

PITZ Server Problem

- ## Server crashes with following message

segfault at 8 ip 00007f16753f3588 sp 00007f165dff93f0 error 4 in libEqServer.so.18.10.1-precise1[7f1675307000+12d000]

DOOCSHashtable::HashSearch(char const*, int)
/doocs/doocssvr1/nightly_builds/release_Ubuntu-12.04-x86_64_18.10.1/library/common/serverlib/DOOCShash.cc:462

- ## Available coredump files:

[Thread debugging using libthread_db enabled]
Using host libthread_db library "/lib/x86_64-linux-gnu/libthread_db.so.1".
Core was generated by `/export/doocs/server/llrfCtrl_server/llrfCtrl_server,.
Program terminated with signal 11, Segmentation fault.
#0 0x00007f42b0c20588 in DOOCSHashtable::HashSearch
(this=0x5a52450, aSearchString=0x7f42a0435e00 "FF_AMPL.TD", aType=1)
at /doocs/doocssvr1/nightly_builds/release_Ubuntu-12.04-x86_64_18.10.1/library/common/serverlib/DOOCShash.cc:462462)
(gdb)

PITZ Server Problem

- No correlation with operators actions
- Problem cannot be reproduced in known environment (gdb, valgrind)
- Problem cannot be reproduced on test machine in PITZ (different firmware version)
- Problem was visible at FLASH ACC23 with installed incorrect version of driver
- No problem with FLASH RF Gun

PITZ Server Problem

- MCS group informed – ticket assigned to Olaf Hensler

- Problem visible on different doocs libraries

- Problem appears in PITZ after 1 week of operation

- Problem appears in REGAE after server update – no major update in code

PITZ Server Problem

- All suggestions, ideas, questions are welcome

Future work

- Properties names unification

- Properties cleanup

- Properties description, values limitation

- Updates of server due to bug fixing

- Updates of server due to user requirements

- Updates of server due to hardware modifications

- Integration with MTCA4U framework

Thank You

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