Updates on the Compute Nodes

at

PANDA Front-End DAQ Workshop
in Alba Italy

Milan Wagner; W. Kühn; J.S. Lange; B. Spruck; T. Geßler;

30.04.2013
Incompatibility of xFP v2 with Compute Node carrier board made new xFP design necessary.

Changes from xFP v2 → xFP v3:
- Virtex-5 FX70T-1 → Virtex-5 FX70T-2
- Platform flash 16Mb → 32Mb

Two modules were produced for Gießen in February 2013.
Testing of the xFP v3 Modules at IHEP

- RocketIO intercon. via carrier board:
  - 4.0 Gbps: Tested with no problems
  - 5.0 Gbps: Tested with bit errors.
- Reading & writing at 200 MHz DDR2_A/DDR2_B.
- Downloading from Platform Flash.
- Parallel reading & writing from flash.
- Testing the SFP+ with 6.25Gb/s.
- Testing the Gigabit Ethernet.
Testing of the xFP v3 Modules in Gießen

- Tested with Linux on the FPGA PowerPC:
  - Both DDR2_A & DDR2_B at full speed,
  - Gigabit Ethernet,
  - UART-to-USB converter and
  - Flash.

- The DDR2 DIMMS on both modules were tested with a long term memory-test.

- Automatic stand-alone programming:
  - Configuration bitstream is loaded into FPGA from PROM on power-up.
  - Linux kernel is loaded from the flash.
The optical links were tested at 6.25 Gbps using a bit-error test and an Aurora connection without problems.

Connecting two AMC cards through the carrier board causes problems:
- 3.125 Gbps: No problems
- 6.25 Gbps: Bit error.

Connecting two carrier boards via ATCA back plane causes problems.
Tested one xFP channel of two card in a MicroTCA with 6.25 Gbps; without errors.
The two xFP v3 cards in Gießen were tested successfully.

Links through the carrier board cause problems.

The carrier board will be redesigned.

Version 4 of xFP and carrier board with Xilinx’s Kintex 7 is in planning.