

Compute Node Hardware Status

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for the Gießen Group

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Compute Node AMC v3

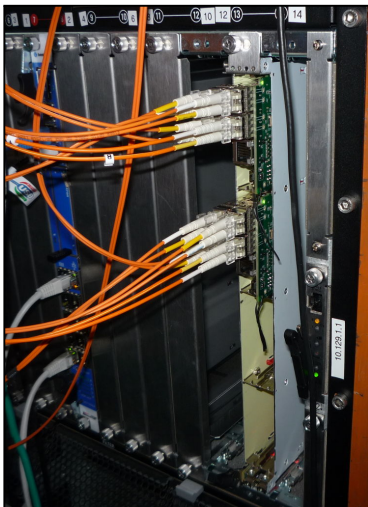
- Compute Node AMCs will be used for the DESY tests.



- Incompatibility of AMC v2 with Compute Node carrier board made **new AMC design** necessary.
- Changes from AMC v2 to v3:
 - FPGA with **speed grade -2** (for 6.25 Gbps link) was used.
 - Large enough Xilinx PROM for FX70T FPGA bitstream was used.
 - FPGA programming mechanism was revised.
- **Two modules** were produced for Gießen in February 2013.

- Tested with Linux on the FPGA PowerPC:
 - Both **DDR2** DIMMs 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. (First test, on previous versions the PROM was too small.)
 - Linux **kernel** is loaded from the flash.
- **RocketIO links** were tested at 6.25 Gbps (see following slides).

Optical links and RocketIO through the Carrier Board



- 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 rate of 10^{-12} in one and 10^{-7} in the opposite direction.
 - **4.0 Gbps**: Tested by IHEP with no problems
 - **5.0 Gbps**: Tested by IHEP with bit errors.
- Similar problem to ATCA back plane.
- Tuning MGT parameters might help.

RocketIO through a MicroTCA Backplane



- A MicroTCA shelf can be used to connect two AMC cards.
- The tested channel worked fine at 6.25 Gbps (after adjusting equalization).
- This can be used as a fall-back for the January test.

- The two AMC v3 cards in Gießen were tested.
- Everything works, but links through the carrier board cause problems.
- **One of the cards** will be used for the **May test** with a MicroTCA shelf.
- **Both cards** will be used for the **test in January**.
- If carrier board problems persist, a MicroTCA shelf will be used for board-to-board communication in January.