Update on the ATCA work going on at LAPP

xTCA interest group - CERN
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IPMC Mezzanine V1

- IPMC mezzanine V1
  - FMC size, based on cortex M3
  - IPMC function
  - ATCA board configuration function

- ATCA Test Board
  - Mezzanine tested on ATCA test board
  - IPMC functionalities:
    - Hardware & software OK

But: No support for AMC
mezzanine size too large...

→ Design of a Mezzanine V2
IPMC Mezzanine V2

**IPMC features**
- IPMB_0 with on board buffers, Hardware address detection
- Hot Swap management with ATCA Leds and front panel switch
- Management of up to 8 AMC + RTM
- On board Event LOG
- FRU & SDR via I2C
- Access to ATCA board sensors via I2C
- IPM_IO: Configurable User Signals for Payload management and e-keying

**NON-IPMC features**
- **JTAG Master**
  - JTAG master via Ethernet (ATCA board debugging, firmware upgrade)
- **Custom interface**
  - Possibility to have a custom interface between the Mezzanine and the ATCA board for custom functionalities
- **Other**
  - USB and UART interfaces (debugging etc..)
IPMC Mezzanine V2 - Hardware

- **Mechanical**
  - Small size: DDR3 VLP Mini-DIMM
  - Vertical or horizontal mounting
- **Based on ARM Cortex M4 µC**
- **Hardware part almost tested**
- **Software of mezzanine V1 successfully ported**
  - Tested on CPPM and LAPP carrier
- **New bug free version (V2.1) will only be produced after extensive tests with new software and firmware (Autumn).**
- **If someone needs a mezzanine sooner, we can provide a patched V2.0**
LAPP IPMC V2 Test Board

- **ATCA board**
- **Designed to tests and debug IPMC mezzanine V2 (Hard and Soft)**
  - Board powering (hot swap, power negotiation)
  - IPMB and communication with shelf manager
  - Sensors reading
  - E-keying
  - AMC power management with different devices
  - AMC management (communication with MMC)
  - Ethernet / USB / UART
  - User_IO and IPM_IO

- **Features**
  - 4 AMC slot + 1 MMC slot
  - Communications between 2 AMCs, and to the fabric for E-keying tests
  - Spy FPGA connected to IPMC signals
LAPP IPMC V2 Test Board

- Board received in March
- Test on-going
- IPMC Mezzanine V2 with V1 software successfully tested
IPMC Mezzanine V2 - Software

- Re-design of software for mezzanine V2 for
  - AMC support
  - Better take into account users requirements
    - Easier integration of users module
    - GUI for some configuration (FRU/SDR, IO)
- Fully open source
Mezzanine V2 software architecture

Component:
- Resource Broker
- IPMC
- AMC Mgt
- JTAG Mst
- User I/O
- TCP server

Middleware:
- IPMB
- IMC
- lwip (BSD)

HAL:
- USART
- USB
- I²C
- SPI
- RCC
- GPIO

Driver:
- libopencm3 (LGPL)
- ethernet

MCU:
- STM32F4x7
LAPP IPMC Mezzanine V2

conclusion

• Hardware almost tested. Tests on-going with the new test board

• New hardware (bug correction) for Autumn

• Work on new software version on-going

• New software version (beta released) for end of may