LAPP IPMC STATUS

9th xTCA IG Meeting

25 February 2015

Guy Perrot on behalf of the LAPP Team

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Outline

• Hardware
• Firmware & Tools
Hardware

- Hardware is V2 Rev. 2
- Tests are done with Boundary Scan: 90% of BS nets covered, 80% of all nets.
- 120 boards have been produced and tested (100 requested) in 2014.
  - Only one with pbs (MicroC replaced).
  - 24 have been configured (MAC address and firmware) and 22 delivered.
- Future productions: 60 in 2015 (on hold) & 60 in 2016 (as of today).
- Clients: ATLAS FTK, LAr & L1Calo (e/j/g/FEX, Topo); CMS, BELLE.
- Hardware documentation: http://lappwiki.in2p3.fr/twiki/bin/view/AtlasLapp/ATCA
Firmware (Software) & Tools

- **ICARE-00-00-07** available very soon. (ICARE-00-00-06 online)
  - tools for compiling, loading, debugging and executing the IPMC software.
  - source code (ICARE framework) for the IPMC.
  - Many examples for sensors, SDR/FRU…

- **IPMC firmware**
  - Management of ATCA blade
    • FRU/SDR, Sensors, Backplane E-Keying.
  - TCPIP on 10/100 MbE for IPMC firmware update (proprietary solution).
  - What is not yet integrated:
    • AMC Management.
    • JTAG Master.

- **Tools & Code will be available in chapter Software ATCA IPMC here:**

- **Discussions on going to get help for completing the firmware.**

- **It will take sometime before missing features are implemented due to lack of human resources (six months?)**
• Factory Firmware will be initially stored in both the IPMC flash memory and micro-controllers internal flash memory.

• The factory firmware always remains available in the IPMC flash memory.

• The micro-controllers will revert to it after 3 failing consecutive attempts of upgrading the internal flash memory.

• **Firmware update requires a new firmware in the IPMC CPLD.**
  - Version 5 soon to be available from the ICARE twiki page.
  - Requires the USB-JTAG Adaptor and openOCD tool for upgrading.
  - For those requiring it, IPMCs will be exchanged if you do not want to do the update yourselves.
Summary

- The IPMC hardware is in production without any problem.
- Firmware (software) is late and will take time.
- Discussions are on going to get help.
<table>
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<tr>
<th>Experiment/Subdetector</th>
<th>Contact</th>
<th>June 2014</th>
<th>June 2015</th>
<th>June 2016</th>
<th>June 2017</th>
<th>Distribution Aug14</th>
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<td>Jinlong Zhang/Tiehui Liu/Alberto Annovi</td>
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FTK/Pulsar2: 43 Summer

gFEX: +1 ?

Table produced 18/3/2014 updated 31/7/2014 (BELLE) updated 11/8/14 for distribution August 14

Updated 24/9/14 for gFEX and modified 5/11/2014 for sharing between gFEX and LAr
**IPMC Features**

- IPMBus 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 access via I2C
- Access to ATCA board sensors via I2C
- IPM_IO: Configurable User Signals for Payload management, ekeying …

⇒ Reduce number of devices and save time for ATCA carrier designers
Non-IPMC Features

- Ethernet
- JTAG Master
- Custom interface
  - Up to 35 user IO
- USB port
- IPMC firmware upgrade
  → auto back to Factory Firmware if core freezes

⇒ Applications:
- Carrier FPGA or µC firmware upgrade via Ethernet
- Interface between Ethernet / USB and user defined bus
- Etc… (user ideas)
Software

• Only Open Source Software.

IPM library
socket library
Peripheral library

IPM handling
board configuration
and monitoring

Development tools
- ARM compiler
- debugger (gdb) + OpenOCD
- programmer (OpenOCD)

User environment
- web interface
- client interface
- file server (boot and board control)

I2C (IPM protocol)
JTAG/USB
Ethernet