DHH Initialization

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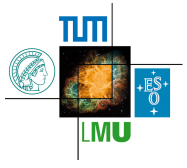
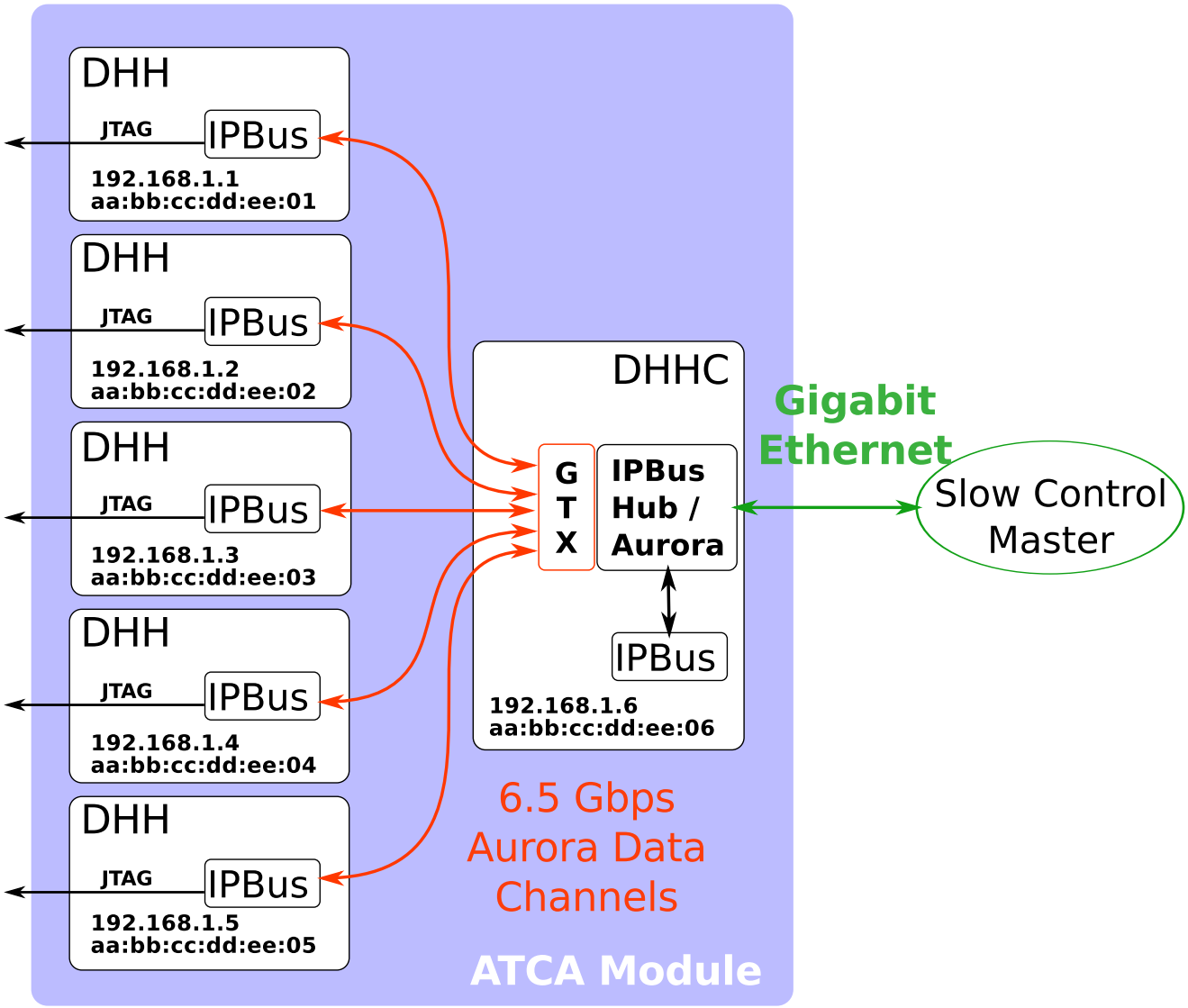
6th Belle II PXD/SVD workshop
October 2, 2014. Pisa

supported by:
Maier-Leibnitz-Labor der TU und LMU München,
Cluster of Excellence: Origin and Structure of the Universe,
BMBF



Slow Control Overview



Outline

Flash Programming

- Motivation: fast firmware update without JTAG
- Lightweight implementation:
  - 3 IPBus registers + 512 Words FIFO
  - simple FSM for access to parallel flash
  - software for reading flash image files (generated by Xilinx tools) and flash access
- Buffered programming performance: 1.5 minutes per image (Xilinx Impact: approx. 15 minutes)
- Support for reading flash from firmware
  - Storing board ID, MAC address, other read-only parameters
- Programming over JTAG still possible as fallback option

Outline

Migration to IPBus v. 2

New Features

- Reliable communication over UDP / frames retransmission
- IP address discovery using RARP protocol
  - RARP - Reverse Address Resolution Protocol (simple alternative to DHCP)
- Multiple frames in flight

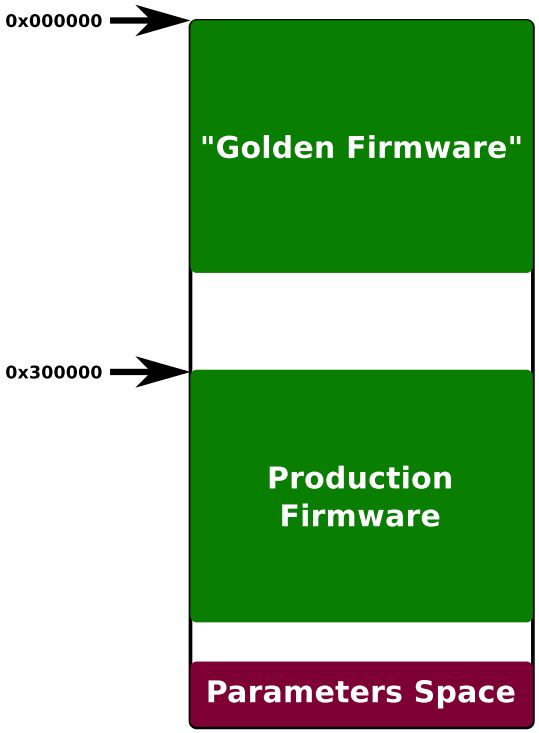
Status of IPBus 2 Integration

- Only IPBus core is replaced
- Works mostly, fails from time to time during block transfer

Outline

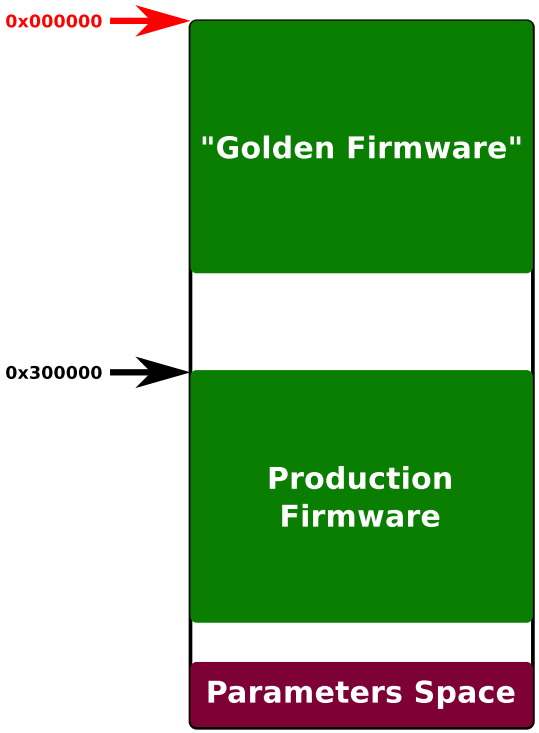
"Golden Image"

- "Golden Image" - recovery firmware with basic functionality
- Idea: stable firmware with test functionality. "Everything except data processing".
  - IPBus
  - Flash programming
  - JTAG
  - B2TT
  - Environment monitoring
  - Hardware tests
- Will reboot to the full feature firmware by the IPBus command



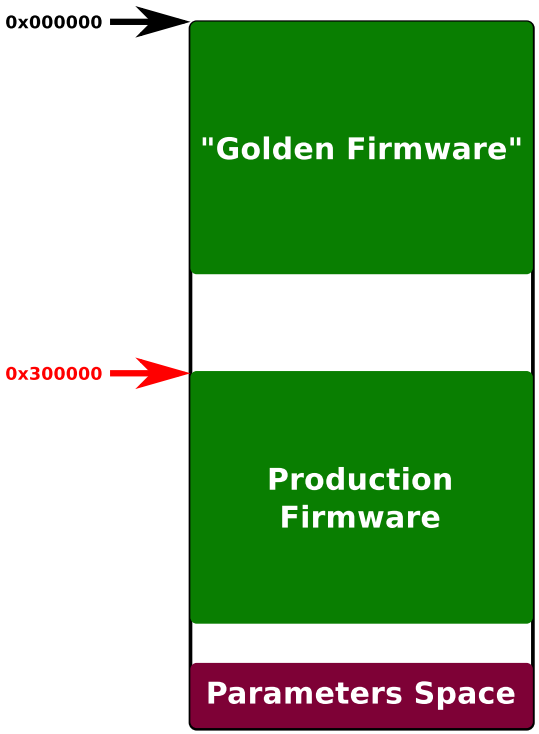
System Initialization Procedure

1. Power up DHH
2. DHHC loads golden image
3. DHHC requests IP address from RARP server
   - DHHC is online
4. DHHs load golden image
   - Aurora links between DHHs and DHHC are established
5. DHHs request IP addresses from RARP server
   - DHHs are online
6. Optional: hardware tests / firmware update
7. EPICS issues warm reboot command
   - all modules go offline



System Initialization Procedure

8. DHHC loads production firmware
   - if firmware fails to load, golden firmware will be loaded. GOTO 2
9. DHHC requests IP address from RARP server
   - DHHC is online
10. DHHs load production firmware
    - if firmware fails to load, golden firmware will be loaded. GOTO 4
    - Aurora links between DHHs and DHHC are established
11. DHHs request IP addresses from RARP server
    - DHHs are online
12. Configure DHH/DHHC
13. Power up PXD



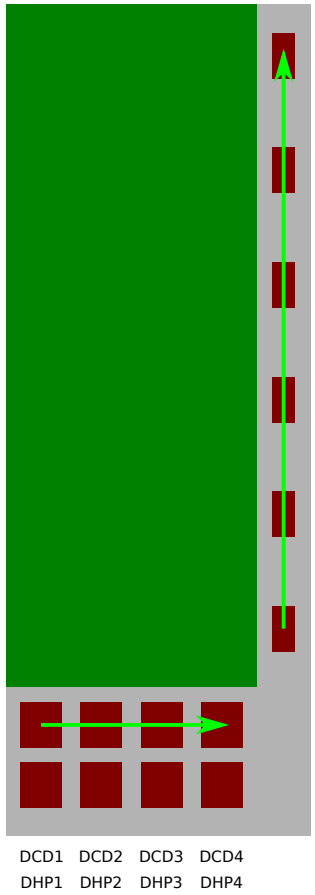
Thank you!
Questions?

Back Up

Back up slides

Back Up

Outer Backward



Outer Forward