

Production and in-system programming of MicroTCA boards

Thursday 10 December 2015 11:45 (15 minutes)

Hardware installation for European XFEL is a huge logistical challenge, since hundreds of boards have to be tested, programmed, maintained and serviced. DESY MSK department provides and uses an automated approach for programming MicroTCA boards - for post-production-programming and for in-field-update of all on-board memories.

These are the key aspects:

1. Automated management programming: DESY has developed a method for script-based programming of MMC, Bootloader, FRU, and Chip fuses
2. Automated FPGA programming: DESY provides a command-line tool for generation of HPM files - for both MMC and FPGA bit files. If DESY MMC V1.00 is used, the upload process can be shortened significantly due to usage of a proprietary bitstream compression.
3. Toolchain integration: The software build tools are scripted. The version number is taken from version control system via pre-build-scripts and is automatically placed into the firmware images, making it possible to query version number via IPMI tool and trace changes according the DESY version control system (SVN). Post-build scripts automatically generate directly uploadable HPM files.
4. In-field update: All memories can be programmed via IPMItool, allowing remote update of all stations.

The methods, tools and scripts are presented. They are available to DESY licensees.

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Session Classification: Session 6