Solution for 'Hot-Upgrading' the Flash Memory in Compute Node

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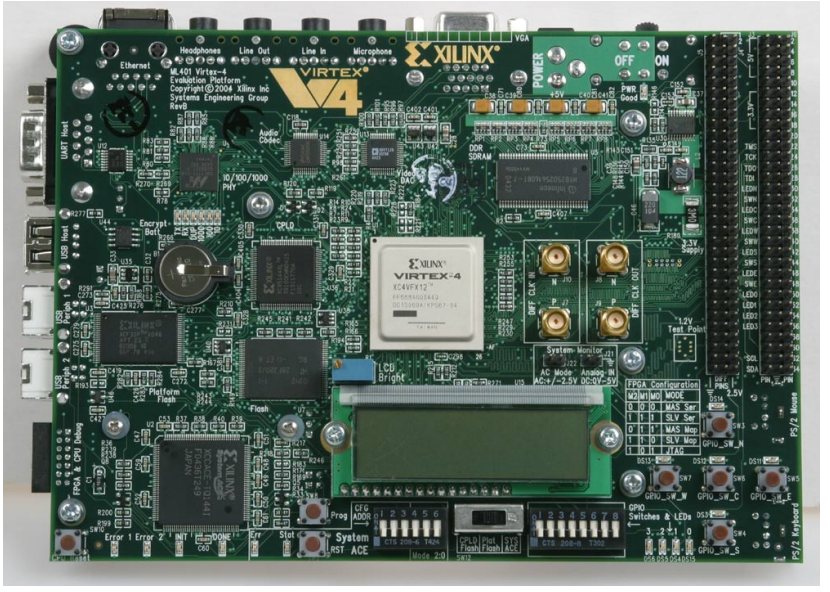
Compute Node Design in Giessen



- Prototype design
- Based on ML403 commercial board from Xilinx.

ML403 Evaluation Board

- **Xilinx Devices:**
  - Virtex 4 XC4VFX12-FF668-10 FPGA
- **Memory:**
  - 64 MB DDR SDRAM
  - 8 Mb SRAM
  - 8 MB Linear Flash
  - 32 Mb Platform Flash
  - System ACE CF card
  - 4 Kb IIC EEPROM
- **Interfaces:**
  - 10/100/1000 RJ-45 Ethernet Port
  - RS-232 Serial Port
  - JTAG
  - 3 USB Ports
  - 2 PS/2 Connectors (Keyboard/Mouse)
  - 2 Audio (Microphone/Head Phone)
  - General Purpose I/O: Buttens and LEDs
  - ……
- **Display:**
  - 16 x 2 Character LCD
  - DB 15 VGA Display
- **Clocks:**
  - 100 MHz Oscillator
  - 2 Clock Sockets

Flash Memory

- FPGA configuration data and operating system image are both stored in flash memory chips.
- The hardware platform could be updated by: 1. power on and boot the system. 2. update the configuration data in flash. 3. reboot the system.
- Also the operating system image.

System Upgrading

- The OS kernel image and the hardware configuration data are both stored in the flash chips on board.
- After the booting of Linux, the flash memory could be addressed via its device driver. Then the configuration data and kernel image could be upgraded in Linux.
- Reboot the system and hence the updated hardware and OS begin working.
- Operated remotely and need no download cable.

Backup Mechanism