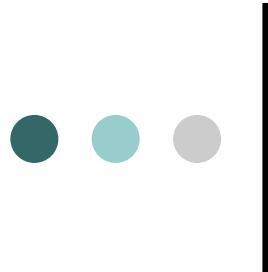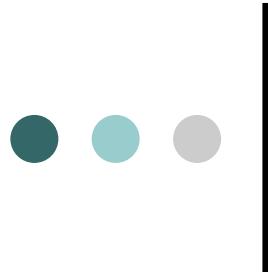# Status:
EPICS on Xilinx FGPAs

Peter Zumbruch

GSI

Strategy

○ Hardware ML403

○ Based on VMware image

   ● provided by KIP (N.Abel)

   ● containing all necessary Tools

      • Xilinx ISE 8.2

      • necessary IP cores (later)

○ uClinux running on ML403 (N.Abel)

Strategy (2)

○ Install EPICS on/in image

- Compile locally EPICS

- develop configuration files for cross compile

  - ppc architecture

  - uClinux OS

- cross compile EPICS for ppc/os

  - EPICS base

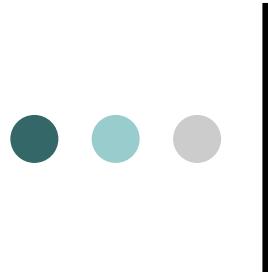 - IOC, (one) i.e. (static) executable

Strategy (3)

○ Include this into image to upload to FPGA

○ Tests

- IOC locally

- IOC remote access

- move to other Virtex 4 platforms

Status

- Hardware ML403 ✓

- Based on VMware image ✓
  - Ethernet IP core license (invalid license)

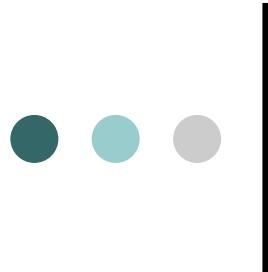- uClinux running on ML403 (N.Abel) ✓

Status (2)

○ Install EPICS on/in image

- Compile locally EPICS ✓

- develop configuration files for cross compile (✓: prepared/in test)

    - ppc architecture

    - uClinux OS

- cross compile EPICS for ppc/os

    - which compiler to use?

Details: Configuration Files

○ EPICS Build systems uses sets of *CONFIG files*

(Makefiles included in build process)

to define necessary informations

- -I , isystem
- -L
- CFLAGS, CXXFLAGS, FLAGS
- (CROSS)-COMPILER
- HOST/TARGET OS
- *...*

prepared for linux-x86.uClinux-ppc405

Details: Cross Compiler

- Two different gcc-based configurations available:
  - Xilinx EDK
    - powerpc-eabi-{gcc,g++,ar,ld}
    - 3.4.1
  - uClinux Distribution
    - powerpc-linux-uclibc-gcc
    - no g++ available
      - (Toolchain not in VMware image)
    - 3.4.2

Details: Cross Compiler - Problems

○ configurations differ (gcc/g++ –v)

	eabi	Thread model	nfp	with-newlib	with-cpu:405	with-headers	with-float=soft	c++	disable-nls	with-gnu-ld
EDK	✓	single	✓	✓	✓	✓		✓		
uClib	?	posix					✓		✓	✓

- powerpc-eabi-{gcc,g++,ar,ld}
  - doesn't find cc1, cc0 when compiling

Problems (2)

○ If cross-compile succeeded ...

  ● get knowledge how to get back to FPGA ...