Hardware-software co-simulation for medical X-ray control units

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• Motivation
  - Our industry partner manufactures angiography systems
  - The system grew over 20 years
  - It became a challenge to change/extend the system without breaking working parts of it

=> Develop the system in a virtual environment (limited to X-ray control unit)
• The real control unit
  - A standard x86 PC running QNX + applications
  - An FPGA board connected to the PC via PCIe
  - Both process signals/data relevant to safety (redundancy)
• The virtual environment
  - Map the PC to the virtual machine QEMU
  - Map the FPGA to the hardware simulator SystemC
  - Develop an abstract XML-based system description language on top of SystemC
  -Extend QEMU by an emulated PCIe connection to SystemC to final hardware-software co-simulation

=> Virtual X-ray control development environment
Thank you!