I. MOTIVATION

Our hardware demonstration presents the Reconfigurable Common Cloud Computing Environment – RC3E – a cloud capable FPGA resources management system for design and test automation in a cloud environment. The motivations for our RC3E system are:

- Hardware pooling to reduce acquisition costs and increase hardware utilization
- Remote access to a high variety of FPGA-based systems
- Ready-to-use programming and test environment for on-demand self service
- Automated hardware integration testing
- Team oriented hardware design and test
- Centralized license management

An use case is the team oriented design and test of a streaming-optimized IP-Core for the attachment of hard disks and solid state drives with Serial ATA interface.

II. PROVIDED SERVICES

Fig. 1 illustrates the RC3E client-server architecture with a remote access terminal, management and compute node. The system therefore provides the following services:

- Flexible resource allocation of FPGA boards and VMs
- Remote access via SSH, Remote Desktop
- Remote debugging via e.g. Xilinx ChipScope
- Ethernet network access to the FPGA board
- Host/Device communication via PCIe, Ethernet, UART

Fig. 2 shows a) our two node test system with four FPGAs in total, b) the resource management in a remote terminal session and c) the hardware design of one of our use cases, comprising the IP core under test and the test controller.