RCE Generation 3: Example Project

Introduction

This project is a basic project demonstrating how to setup/build/run a Reconfigurable Cluster Element (RCE) project from scratch.

Requirements

Hardware Requirements

The following hardware is required for this example:

- 1x Cluster On Board (COB Version 8) with 1x Digital Processing Module (DPM Version 2) and with 1x Digital Timing Module (DTM Version 2)
- No Application Specific Rear Transition Module (RTM) required for this example project
- 1x Linux Server with either a secondary 1 GigE port or a secondary 10 GigE port

Setup and Configuration

SVN Checkout: Firmware and Software

If you are building on a SLAC server:

```
$ cd /u1

$ svn co file:///afs/slac/g/reseng/svn/repos/ExampleRceProject/trunk ExampleRceProject
```

If you are building on a remote server:

```
$ cd /u1

$ svn co svn+ssh://$USER@rhel6-64.slac.stanford.edu/afs/slac/g/reseng/svn/repos/ExampleRceProject/trunk ExampleRceProject
```

- Note: $USER is your SLAC username
- Note: Add the following lines to your .ssh/config before executing svn+ssh command:
    - ControlMaster auto
    - ControlPath ~/.ssh/master-%r@%h:%p

For more information, see TID-AIR Firmware Build System presentation

Linux Server

insert text here about how to setup the DHCP and setup NFS

ATCA Crate

insert text here about how to connect the COB to the server and setup the shelf manager

ZYNQ SD Memory Card

insert text here about how to program a new SD memory card from scratch

To do list

a) Shelf/network setup: the RCE training workshop had quite a bit of general introduction for this, but we need create some very concise IKEA instruction for someone has an ATCA shelf and just got the COB in the mail for precisely what to do to get it up and running. One piece of info not in the RCE training workshop is how to setup the TTC timing, which is ATLAS specific with the TTC RMBs.

b) Boot DPM into Linux: is the workshop instruction sufficient and just needs to pick out the essential part, or there are some special elements to take care of ?

c) SD cards: what should be included on this for distribution ? Instructions for users to update SD cards available ?

d) Software build and repository, other infrastructure items (e.g. NFS) and utilities (e.g. rce_talk): what's the possible evolution path ? Any licensing issues with proprietary code if we were to distribute everything ? Is there a clear boundary to divide RCE core and ATLAS applications so that we keep the core at SLAC and ATLAS app in CERN SVN ? When can the core be stable enough so that we only need to distribute binaries ?

e) For the many new users, can the RCE training workshop examples (at least the simple ones first) be re-adapted to work also in the Linux example ?

Building and Running