Rivan Controls WP Proposal

Hugo Denham-Wells

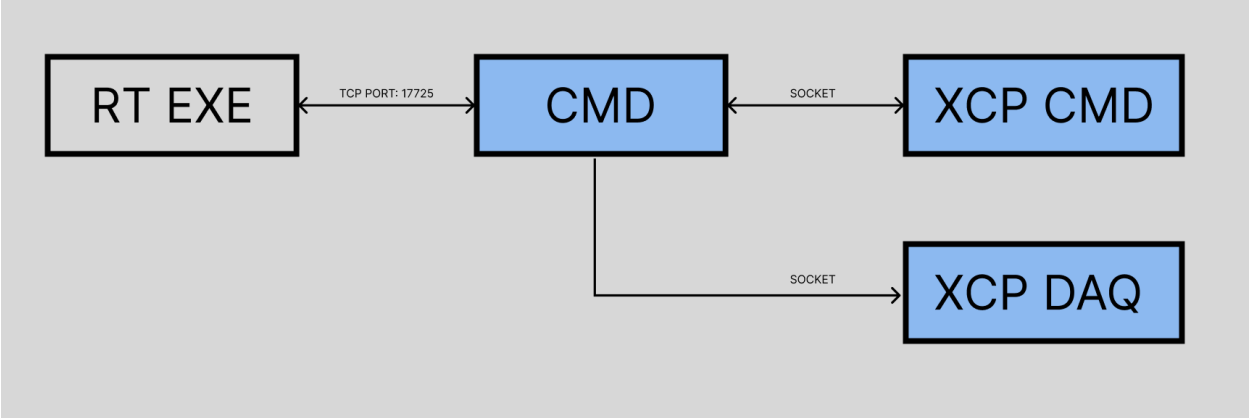
Objective

We are looking to collect data from our machines running our controls software - this data collection must be highly robust to faults and internet connectivity issues.

Project Description

Attached is a zip file containing a realtime exe compiled for aarch64, I have also attached the source if you would like to compile it for yourself or for other architectures. There is also a pdf containing the XCP spec and the corresponding a2l file for the executable.

I would like you to setup the following:



Here we will have four executables running simultaneously.

1. RT_EXE - The realtime executable which is a proxy for the controls software, this is what we are extracting data from
2. CMD - RT_EXE connection manager
3. XCP_CMD - XCP controller for the RT_EXE
4. XCP_DAQ - The data subscriber (proxy for database)

Requirements

GENERAL

1. Must be written in a compiled language
2. Please keep to 1 day of work

CMD

1. Manages the connection to the RT_EXE via TCP port 17725 (hard coded), robust to connection loss or restart of RT_EXE
2. Retains setup state of XCP_CMD setup in case of RT_EXE or CMD restart
3. Transparently sends XCP_CMD packets to the RT_EXE and returns the response to XCP_CMD
4. Pushes all DAQ packets to the XCP_DAQ process

XCP_CMD

1. Sets up the DAQ list of the on the RT_EXE to stream the “measurements” SIMPLE_RT_Y.Q_1 and SIMPLE_RT_Y.Q_2, once this complete and the DAQ list is streaming - the process exits

XCP_DAQ

1. Prints DAQ data to stdout in decoded form
2. Persistent data transfer between CMD and XCP_DAQ, i.e. if either process fails while the other is running data cannot be lost

Output

1. All source code & build info (makefiles etc..)
    a. Please create a github repo & commit your changes regularly
2. Compiled executables
3. A loom of the system working
4. A writeup on the project with a focus on what faults the system manages correctly and what it does not, and what you would do if you have 2 weeks to work on improving the system - This will be presented to us via a call.