

Control system based on a
Highly
Abstracted and
Open
Structure



WP3

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WP3 Tasks

- collect and synthesize HW/SW requirements for the two use cases
- !CHAOS implementation for ESCO use case: !CHAOS DD, deployment, test and qualification
- !CHAOS implementation for Physics use case (BTF): !CHAOS DD, deployment, test and qualification
- !CHAOS & LabVIEW integration

SW !CHAOS requirements (General)

- Highly Scalability and Reliability of data services (cache, filesystem, DB)
- API to retrieve the dataset values of a specified CU instance for a given time interval with the possibility to specify *first* and *last* time keyword
- API to retrieve the list of CU of a given class
- API to retrieve the list of CU of a given group

!CHAOS requirements (configuration)

- Read and apply scripts of commands to force the state of the control to a given state
- Dump into scripts the commands given to a CU instance in a given interval of time

!CHAOS requirements (Management)

- Issues identification, historicisation of errors and events
- System Health, not working node identification and recovery (i.e. find and re-attach nodes to working services)
- round trip time, network load

HW requirements

- Embedded platform > 1GHz, > 128MB, Ethernet, Linux
- Highly availability of HW devices and drivers
- Extensible, i.e possibility to extend the platform by stacking expansion board (CAPE)

Beagle Bone proposal

What is a cape?



HW ESCO requirements

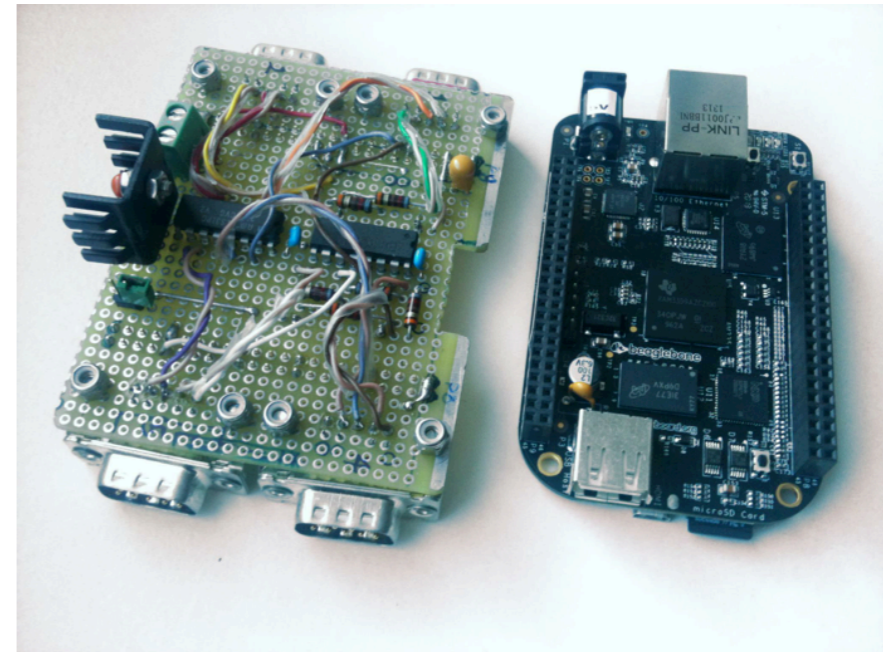
- Temperature, pressure, humidity sensors, flow meters; read in volts (0-10V) or in current (4-20mA) => ADC connectors
- Drive UTA, valves => DAC connectors
- WIFI, Ethernet over Power ? zigbee ?
- GPRS?GPS?accelerometers?
- Extensible, i.e possibility to extend the platform by stacking expansion board

ESCO (agile) development flow

- ESCO, WP3 and WP4 to clarify requirements of **ESCO-CAP**
- 1 people from ESCO will start working ASAP on a beagle bone to develop simple drivers for basic sensors that can be directly attached to beagle
- clarify the use case @LNF
- **continuous integration/tests of HW/SW in the final setup use case @LNF**
- development of the user GUIs (LabVIEW) for control and reporting

HW BTF requirements

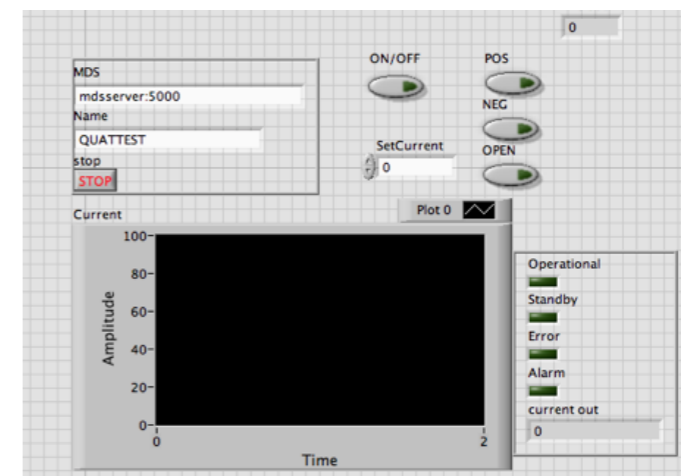
- Bus field connectors: RS422,RS232,CAN,I2C
- PIO connectors
- WIFI,Ethernet over Power ? zigbee ?
- GPRS?GPS?accelerometers?
- FPGA?



home made CAPE to drive up to four power supplies
RS422

BTF (agile) development flow

- BTF, WP3 and WP4 to clarify requirements of (ESCO)BTF-CAPE
- driver development and continuous integration of HW/SW in the final setup at @BTF
- possible integration of some National Instrument HW (!CHAOS that use LabVIEW/NI drivers)
- control/GUIs application development (LabView GUIs that use !CHAOS)



LabVIEW Power Supply GUI
that uses !CHAOS

WP3 re-tuning

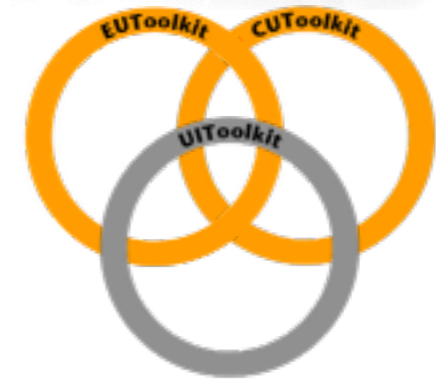
- CUT requirements on SW, required: basic historicisation and health of the system .
- CUT requirements on HW: use of existing HW easy to extend/customise
- LOCAL, limited and self-contained use cases mapped to two real cases
@LNF: Optimisation of power consumption of an UTA (ESCO) and BTF (Physics).

WP3 personell

- Andrea Michelotti (Senior Software developer @Cabibbolab)
- Marco Zagaroli (ADF Solaris) on ESCO drivers/GUI
- 1FT (Expert developer C/C++, nice to have experience in device drivers) on BTF drivers/GUI



!CHAOS



thanks you