CCM

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CCM

CCM is more than just Run Control! There are all aspects of configuration creation, management and distribution, as well as all aspects of operational monitoring.

Functions:

- Configuration and bookkeeping
- Synchronize subsystems
  - what/when in which order
- Operator console
  - user interfaces
- Monitoring aspects
  - Heartbeat, operational monitoring
- Automated procedures
  - E.g.: fault tolerance, auto-recovery

Configuration

What is the scope for the CCM?

- What needs to be configured?
  - DAQ processes, FE configs, etc.
- What are the required interfaces for configuration?
- How/where configuration is stored?
  - Serialization, storage

Run Control

- **What is Run Control?**
  - The part of an experiment that coherently steers the data taking operations

- **What are the building blocks of a Run Control System?**
  - Supervision of processes that are participating in data taking
    Process Management (PMT)
  - Mechanism to interact with all actors participating to data taking
    Inter Process Communication (IPC)
  - Mechanism to abstract the specifics of the experiment's components and describe them in a uniform way
    Run Control Tree, Finite State Machine (FSM)
  - Mechanism to allow the human operator to steer data taking
    (graphical) User Interface

Run Control Tree

- Subdivision of the experiment into a tree, with **well defined branches that may be acted upon independently**
- The Run Control system **provides a framework** for applications, such that the mechanics of receiving/responding to commands is hidden

The main questions...

Options? Who?

1. Which technology/framework/software component we are opting for?
2. Who will lead the investigation/development of the CCM?

Options?

- SCADA / control framework
  - WinCC OA / EPICS
- Utilize building blocks of another experiment's framework/software
  - ATLAS has a reasonably modular control and configuration library
  - We heard a nice presentation on the COMPASS control software yesterday
- YACC!
  - Yet Another Control and Configuration system
  - Start from scratch

Pros/Cons - WinCC-OA

- Pros:
  - Robust in functionalities
  - Lot of extensions (JCOP, UNICOS, etc.)
  - Useful/generic components of the ProtoDUNE RC can be reused
- Cons:
  - You need experts in SCADA
  - Infrastructure was given in CERN, but not existing in Fermilab
  - You need (a lot of) people

I don't have experience with EPICS, so people familiar with the system please comment

Pros/Cons - Adapt existing fwk

- Pros:
  - IF proven:
    - Modularity
    - Portability
    - Stability
  - Probably requires the least amount of manpower
- Cons:
  - Adaptation might take long depending on manpower
  - Might rely on obsolete technologies/techniques

What I can offer here: study/investigation of the ATLAS control software

Pros/Cons - Starting from scratch

- Pros:
  - Highly specialized for the use-case
  - Can be really modern
- Cons:
  - Requires substantial manpower
  - Requires substantial development time
  - Won't be reliable for a long time

Personal opinion: highest risk

Discussion