

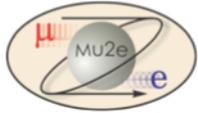
Mu2e-doc-412-v1



# Infrastructure Software Support for Mu2e

Rob Kutschke, CD/ADSS/SSE

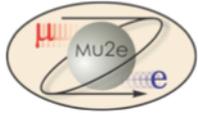
November 13, 2008



# Mu2e Working Schedule



- May 15: students arrive.
- April 2: First release to collaboration.
  - Mid-detailed geometry, G4, hits, doc, (Reco?).
  - Good enough to put Mu2e people to work.
  - Will ask for SSE and GDS support for this phase.
  - I am low duty cycle for March( SiD LOI).
- Feb 1: First release of infrastructure software
  - **This is what I am asking for today.**
    - **Effort 1 to 2 FTE Months.**
  - Ongoing support:
    - 0.25 FTE to May 1?
    - 0.15-0.2 FTE ongoing (in bursts?).



# Some Background



- Mu2e People
  - Infrastructure software: Myself, Andrew Norman (UVA) (25%).
  - Physics software: many but they are waiting for infrastructure ...
- Two options considered:
  - fmwk:
    - Used by MIPP and Nova; advocated by Andrew Norman.
    - We can use this now but it requires significant development in the future.
      - Who will do that development.
  - “CMS-lite”:
    - “Stripped” down version of what CMS uses.
    - Slower roll-out than fmwk but long term support from CD.
    - Can add in stripped out features as needed.
    - To get buy-in, first release must be as functional as fmwk
    - We need a better name.
- **This talk asks for CD support for the CMS-lite Option.**

# Deliverables: Discussed with Jim

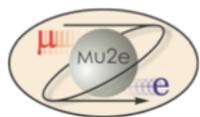
First release by  
Feb 1, 2009

Later

- 1) Framework proper
- 2) Services
- 3) Configuration
- 4) Geometry shell
- 5) Simulation shell
- 6) IO system
- 7) Initial documentation

- 8) Conditions
- 9) Full featured build and release mgt
- 10) Grid features
- 11) Full documentation

1...3 are a single work package in CMS.



# Brief Comments on Each Deliverable



## 1) Framework proper

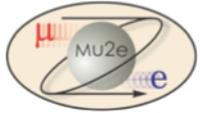
- EDM, provenance and minimal build sys.

## 2) Services

- Message logger, management of random numbers across multiple jobs, ...
- Coarse timer and memory-leak checker, ...

## 3) Configuration

- Declarative or python?



## Brief Comments on Each Deliverable



### 4) Geometry shell

- Who owns geometry; when is it updated ...
- Will ask for SSE, GDS support for internals.

### 5) Simulation

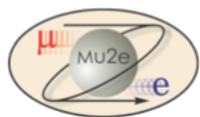
- Who calls G4 when? G4 access to random?
- Will ask for SSE and GDS support for internals.

### 6) IO System

- I hear many good things about CMS's root based IO.
- Discussing: are all data PODs? How to x-ref?

### 7) Documentation

- Enough to get us started.



## Later Deliverables



### 8) Conditions

- Won't need these for a while.  $O(1+ \text{ years?})$ .
- Nominal geometry is good enough.

### 9) Full featured release and build management.

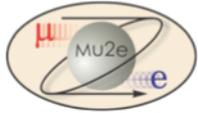
- Prefer to do this soon but it is not a CET job.
- Will ask for support from SSE?

### 10) Grid features.

- Not yet sure what this means.

### 11) Full Documentation

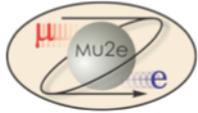
- Mu2e job to write for our users. We will want to reference CET provided material.



# Multi-threading



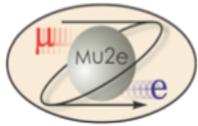
- I don't expect that we will exploit multi-threading any time soon.
- But I do want to develop software that will allow multi-threading if and when root, G4 etc allow it.



# What Next

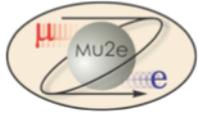


- I have discussed this with Jim and Marc.
  - My written notes have been circulated.
- Over the next weeks we will continue the discussion to refine details of deliverables.
- Does Jim have the good-ahead for his group to work on this?
  - If not, what are the remaining hoops?



# Backup Slides





# My Evaluation of FMWK



- A “classic” root based framework.
- Many things done well.
  - Many everyday things are very easy to learn.
  - EDM: type safety and const correctness
  - Has coarse-grained timing and memory leak checker built in to the framework.
- But:
  - Lots of missing features. Want these from CMS-lite.
  - Root based → global state → difficult path to parallelism.
  - Housekeeping tasks done by user; should be done by framework.