US ATLAS – new grid initiatives

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Outline

- Assume: ongoing efforts (iVDGL, LCG) are covered in other talks (Baker, Gardner, Wenaus)
- Missing pieces in computing model
- Open Sciences Grid
- DAWN proposal
- Relation with CERN
- PPDG years 4+5 funding
- General comments

Computing Model

- Reconstruction at CERN (Tier 0)
- High bandwidth connectivity to Tier 1 and Tier 2 centers
  - Last mile connectivity
- Grid middleware
  - Long term support, reliability
- Support for analyses
- Of course: core/application software

Missing pieces

- Robust, reliable grid operations
  - LCG, Open Sciences Grid, EGEE (EU initiative)
- Support for analysis groups
  - DAWN toolkit
- Collaborative tools (more than computing, of course)
- Resources for the Tier 0

Robust Grids

- Homogeneous versus interoperable model
  - CERN: homogenous
  - U.S.: interoperable
- Efforts to date have been production oriented – each experiment+region integrates middleware and home-brewed tools to run MC production
- Need for 24x7 robust support, single US grid

Open Sciences Grid

- $40M proposal to the DOE – white paper
  - Timing for OMB FY05 submission process for FY 05
- Federated grid, starts with US ATLAS/US CMS, new groups join – must bring resources
  - Software engineering support
  - Hardware: server hardware that enable a federated grid (not part of Research Program funds, iVDGL)
  - BNL+FNAL main centers
- Common middleware

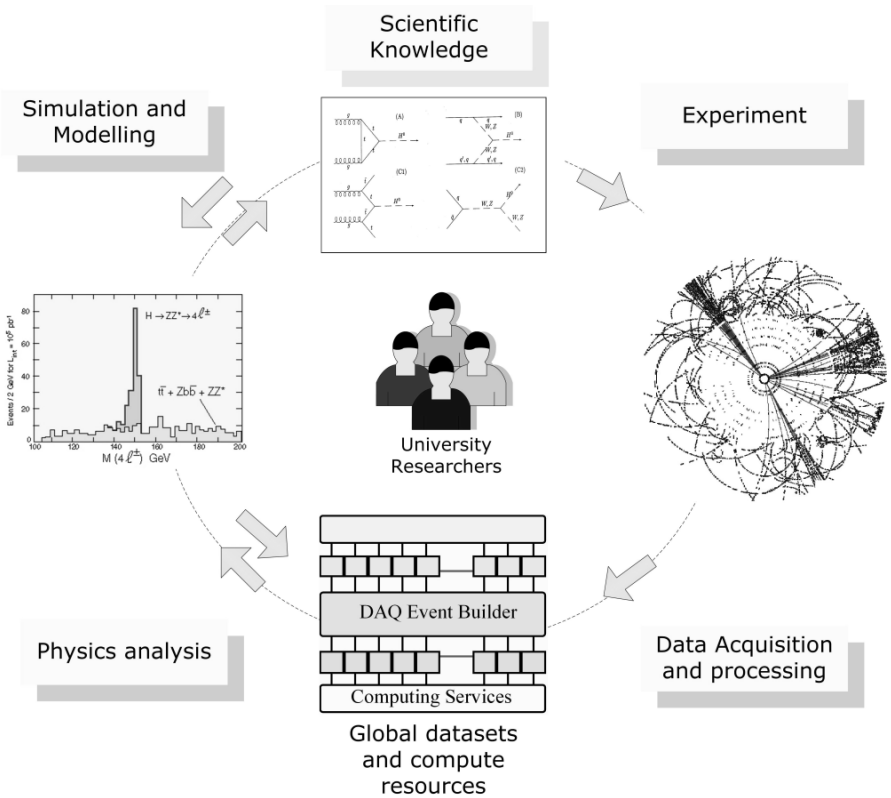
OSG Partnerships

- STAR and PHENIX (J. Lauret, B. Jacak) have contacted Nuclear funding agencies, very positive response
- For Fermilab: D0+CDF obvious candidates
- Computational biology? Astrophysics applications?
- Integration with LCG
  - Relation to EGEE: in effect, a response to the EU

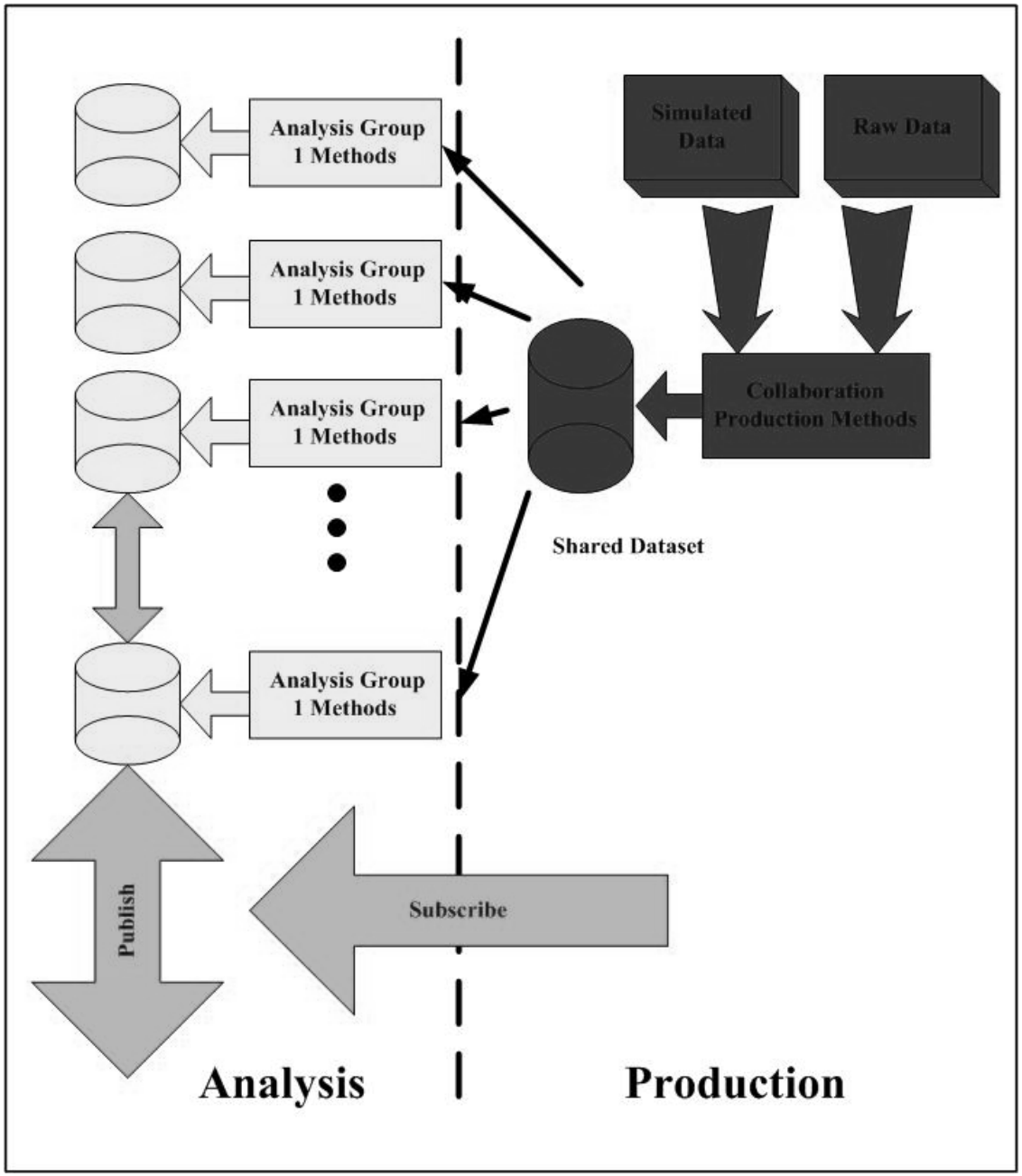
Concerns

- Sold as “Open Sciences”, but with very strong emphasis on the LHC. This raises eyebrows among our non-LHC colleagues.
  - Stress on programs like PPDG – redistribution toward CDF/D0/BaBar in years 4+5?

DAWN: Supporting Analysis groups



- Dynamic workspaces in grid context
- Allow groups to configure resources, define themselves
- Data provenence
  - Validation
  - Reproducibility
- Back-trail to entire chain of production through analyses


Analysis Group
1 Methods
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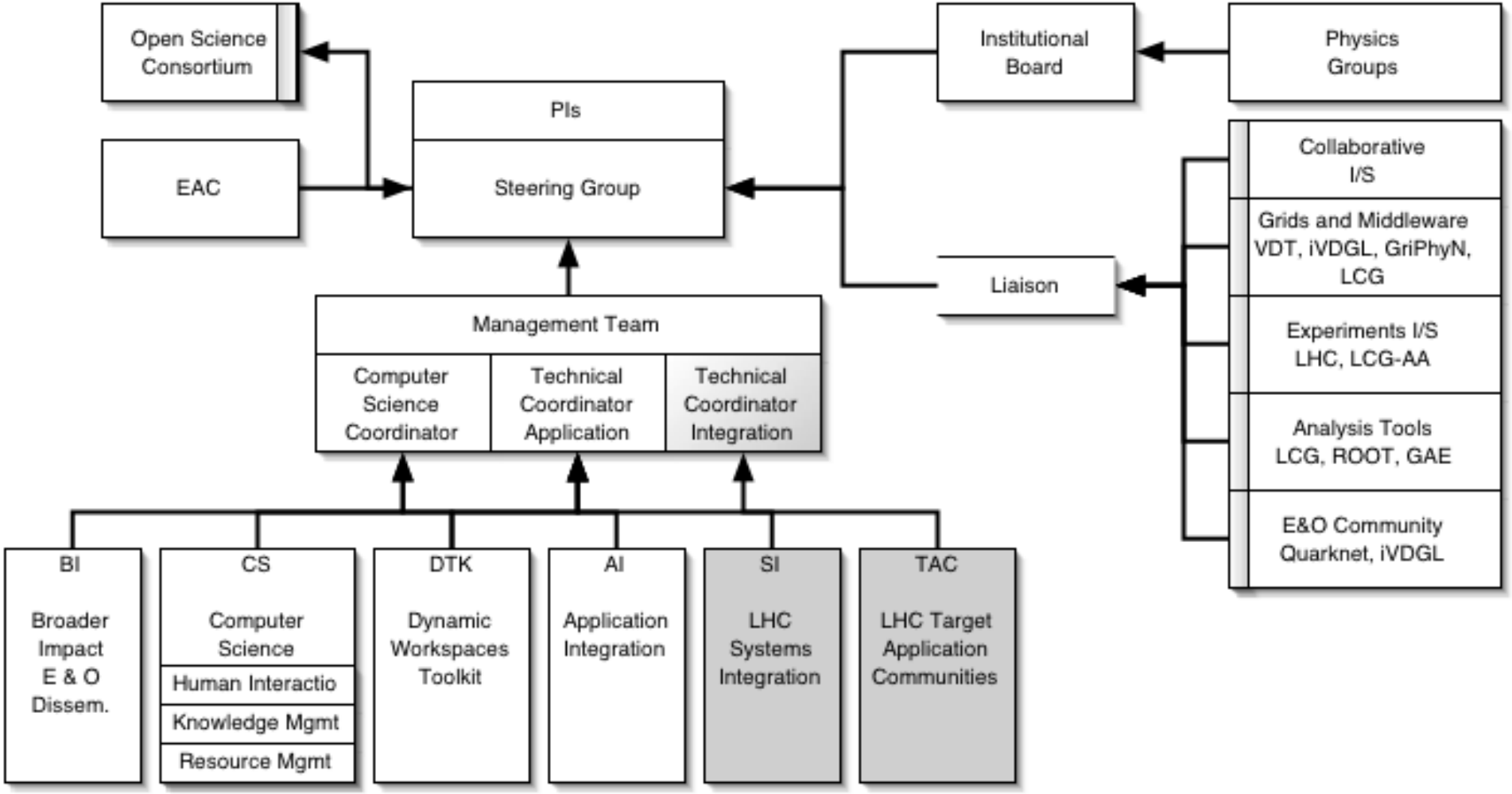
1 Methods
Simulated
Data
Raw Data
Collaboration
Production Methods
Shared Dataset
Publish
Subscribe
Analysis
Production

DAWN

- **D**ynamic **A**nalysis **W**orkspace with k**N**owledge
- $15M Large ITR proposal
  - **Status: submitted end of March, still awaiting feedback, NSF is very late.**
  - **Possibilities: funded as lower level, shared between CISE and MPS**
- **PI's: J. Huth, L. Bauerdick, M. Livny (CS), M. Seltzer (CS), R. Stevens (CS)**
- **Collaboration of US ATLAS+ CMS, CS**

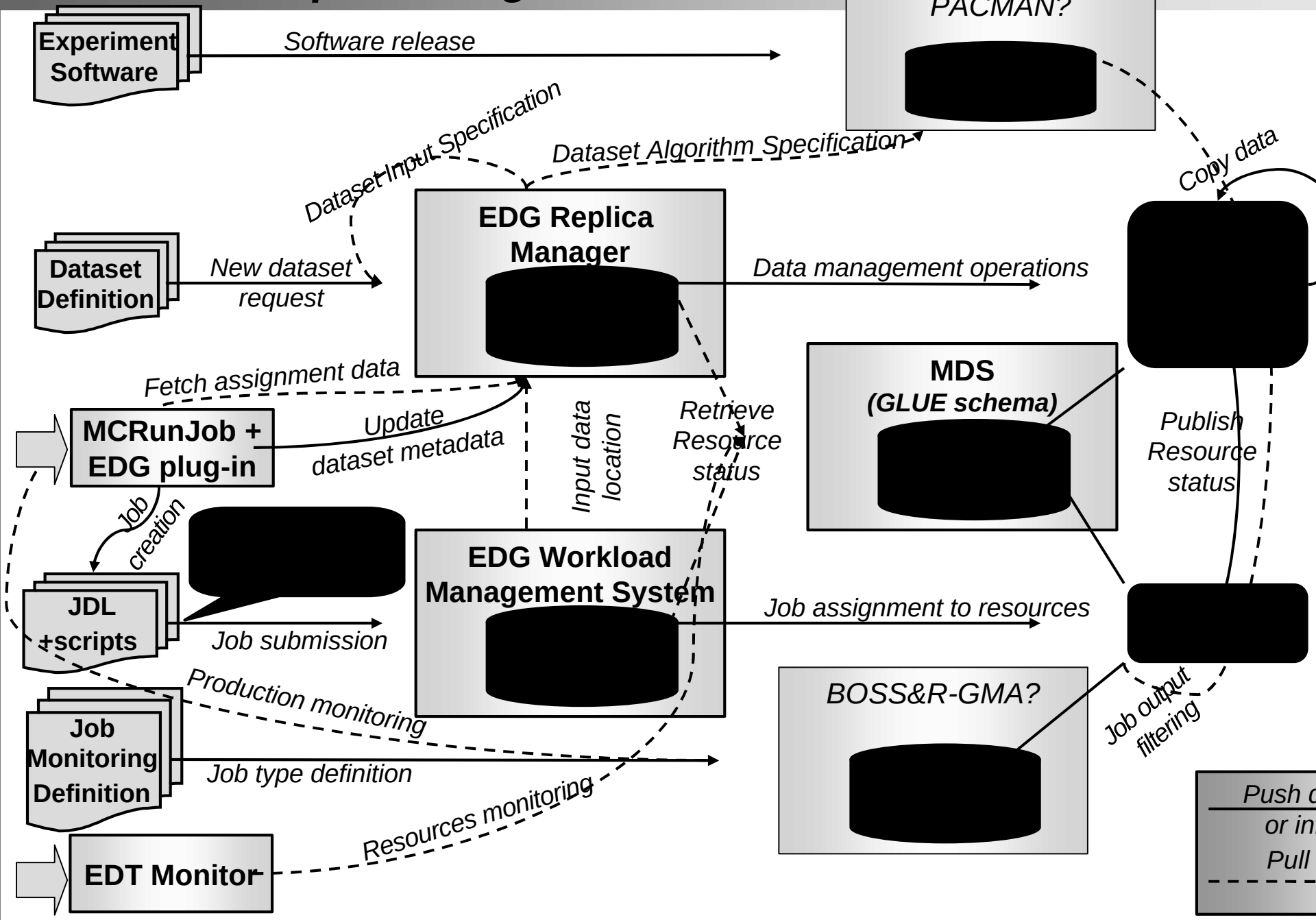
DAWN Management proposed



Relation to CERN

- LCG-EGEE relation
  - EGEE: “**E**nabling **G**rids for **E**-science in **E**urope”
  - EGEE as main supplier for “high level” grid middleware
  - US Supplies lower level: globus, VDT
  - Highly decentralized model – concerns
  - DAWN assumed as US contribution
- Tier 0 funding
  - Shortfall – looking for contributions from countries
  - Heavy lobbying for 400kCHF in FY 05+06 from US ATLAS
    - US CMS – collaborative effort on data transfers – 400kCHF in 04-05
    - Research Program? Big investment in software, M+O, difficult
    - OSG? What do our partners say? (I.e. US CMS)

CMS *LCG-1 "pilot" diagram*



PPDG Years 4+5

- Until now: Experiments (ATLAS, CMS, D0, STAR, BaBar, others) have funded independent efforts, plus CS areas
  - Largely disjoint
- Present discussion:
  - More coherent effort, no entitlements from year 3
  - Emphasis on multi-user support
  - Non-LHC experiments lobbying for more support (response to OSG)

Comments

- New initiatives create opportunities
  - Help make up for funding shortfalls
- Not without costs
  - Must be appealing from a CS perspective but satisfying computing needs
  - Collaboration in larger entities – CERN/CMS/CS/non-LHC
  - Ultimately must have “value-added” from agency perspective