

# U.S. LHC Software and Computing Update

Glen Crawford

DOE/NSF LHC Program Office

HEPAP Mtg 27 Mar 2001

## The Road to S+C Projects: Where were we?

- ✓ GriPhyN “wins” NSF ITR I competition!
  - ✓ CERN LHC Computing Review concluding
  - ✓ New US CMS S+C Project Manager on board
- 
- DOE/NSF Baseline Review in November
  - CERN Hoffmann Review Report Released

# CERN Review of LHC Computing

- Initiated by Hans Hoffmann, CERN/SC, Fall '99
- **Goal:** Evaluate and comment on three major areas:
  - **Software Projects**
  - “World-wide analysis model”
  - **Resources**
- Original report due by Summer 2000, pushed back
- Delays mostly due to resource issues
- Major new wrinkle: “**Grid Computing**”
- **Final Report issued 22 Feb with significant US input**

# Hoffmann Review: Executive Summary

- Blesses multi-Tier hierarchical model for LHC computing
- Accepts role for Grid computing
- Supports common projects, data challenges, OO paradigm
- **Bandwidth required (CERN→US): 1.5-3 Gb/sec/expt**
- **Hardware costs (total, all 4 expts) : 240 MCHF.**  
Estimates CERN “Tier 0” center is ~1/3 of this.
- Recommends LHC Software and Computing Steering Comm. (SC2) to oversee deployment
- Recommends interim software MOUs by the end of 2001

# Hoffmann Review: Exec Summ. Cont'd

- Core software teams of all 4 expts are seriously understaffed. *“...Mgmt of the Collaborations must seek solutions to this problem with extreme urgency.”*
- Projected staffing level of CERN/IT is incompatible with efficient operation of CERN-based computing + support

*“The serious shortfall of currently available human resources for software development and support of the computing infrastructure is a major concern expressed in this report.”*

# Towards US Software + Computing Projects

## DOE/NSF Joint Review of US LHC S+C Projects

- November 14-17, 2000 @ BNL
- Full technical, cost, schedule + mgmt review
- Establishes (near-term) Project “baselines”
- Impacts funding decisions for FY01/02
- Similar to US LHC Construction Project reviews
- Report issued Jan '01 (copies available).

# The Review Team

- Joel Butler, FNAL
- Aesook Byon-Wagner, FNAL
- Pat Dreher, MIT/LNS
- Michael Ernst, DESY
- John Reynders, Sun
- Terry Schalk, UCSC
- Marjorie Shapiro, LBNL/UC Berkeley
- Michael Tuts, Columbia Univ.
- Chip Watson, TJNAF
- ...and the usual agency suspects

## DOE/NSF Review: Closeout

- **“Baselining”** : The Committee recognizes the significant uncertainties present at this point. Nevertheless, at the project planning level, we approve the FY01/02 plans of both US ATLAS and US CMS, with the following caveats:
  - *Assuming* agency funding guidelines are achieved,
  - *Given* international uncertainties to be resolved,
  - *And* issues raised in the closeout/reports.

## DOE/NSF Review: Comments

- Considerable progress since last review
- Overall strategies of both groups are sound
- Both groups making significant + important contributions in software and computing
- US groups taking leading roles in core s/w
- “Tier 1” plans detailed and well-conceived
- Management structures are in place and appear to be functioning well

## DOE/NSF Review: Recommendations

- Clearly map priorities to funding requests
  - *prepare for shortfalls if they occur*
- Continue building + staffing Tier 1 facilities
- Tier 2 plans and policies need clarification
- Software MoU's need to be established
- Beware of software “mission creep”

## DOE/NSF Review: Recommendations

- Grid efforts good, but watch carefully
  - *understand dependencies, milestones + triggers*
- Show *all* effort (however funded) in WBS
- General support for planned level of effort
  - *near-term funding goals need to be met*
  - *“build-to-cost” is an appropriate model*

# US LHC Software + Computing Funding Profiles

*(Including Tier 2)*



## DOE/NSF Review: Action Items

- DOE/NSF to supply software and computing project funding profiles as soon as practicable.
- Host lab contributions to projects need to be negotiated with agencies/projects.
- Hold a mini-review in ~6 mos., full review in ~1 year (status reports in interim)

## The Road to S+C Projects: What's Next

- DOE/NSF approve FY01 funding, including host lab contributions (~done)
- Continue quarterly S+C status reviews, including common projects (March 30)
- Refined PMPs, including Tier2 policies
- S+C Project Mini-Reviews (May 30/31 @ NSF)
- First software MoU's in place (Summer 01?)
- Full "Lehmanesque" Review (Oct 9-12, FNAL)

## The Road to S+C Projects: What Else?

- **GriPhyN Phase II** now in NSF ITR II competition (requesting \$15M for Tier 2's over 5 yrs.)
- **Grid Computing** is *extremely* hot worldwide: major funded efforts in **UK, Italy, EU...**this area has (potentially) **very broad impacts**
- **Networking** issues starting to get attention (US working group in progress)
- Expect CERN to open parlay on computing resource issues soon (April RRB Mtg?)

# Summary

- US LHC S+C projects have “passed” major review of their efforts
- International planning, coordination developing following US lead

## Issues:

- Near-term funding for US efforts
- Will CERN generate sufficient resources?