Computing for RHIC Experiments

Computing in the last LRP

- "comput[e/ing/ation]" mentioned 83x in NSAC 2002 LRP
  - 52x in nuclear theory, "Large-Scale Computing Initiative, ..."
  - 21x in experimental context, "Advanced Scientific Computing
    - one page description of facilities : RCF,RCF,NERSC
  - 9x in general terms, applications, workforce training, etc.
- and 31x in 2005 NSAC Report
  - 30x in nuclear theory
  - 1x in workforce training
  - 0x in experiment
    - pre-occupation w/ facilities consistent w/ charge
- 2007 LRP
  - primary computing facilities, broader emphasis

... Computing facilities are vital to experimental programs

Premier Computing for RHIC

- RHIC Computing Facility (RCF) is the central computing workhorse for data analysis and archival storage for all RHIC experiments
- Data requirements, projections based on 30w runs
  http://www.bnl.gov/npp/docs/RHICplanning/RHIC_Mid-termplan_print.pdf
  - 2006 : 4.3 PB hpss, 2.1MSI2K, 880 TB
  - 2012 : 46.5 PB hpss, 31.1 MSI2K, 7.4 PB
- Investments
  - $2-3M/yr hardware, peak in 2009, and again for RHIC II
  - 20 FTE, share US ATLAS computing
  - plus infrastructure

Investments in computing required to deliver science from upgrades

NERSC

- PDSF
  - PDSF provides computing for STAR (use analysis and 50% embedded simulations), ALICE, SNO, KAMLAND, Heavy Ion Theory, and others
  - Projections
    - 2006 : 0.55 MSI2K, 200 TB
    - 2012 : 5.9MSI2K, 3.1 PB

Additional Computing

- CC-J

  http://ccjsun.riken.go.jp/ccj/present/CCJWAN2006.pdf
  - PHENIX pp data analysis
  - 2006 : 1.2PB hpss, 500cpu, 50TB
  - 270TB pp-data gridftp transfer from PHENIX
- Vanderbilt Vampire, ORNL group cluster
  - PHENIX simulations
- OSC-OSU, TLC^2
  - ALICE simulations, 0.4 MSI2K proposed
- LC (LLNL)
  - PHENIX simulations, ALICE, 20% of 1MSI2K, 700 TB

NP benefits from additional (international) resources

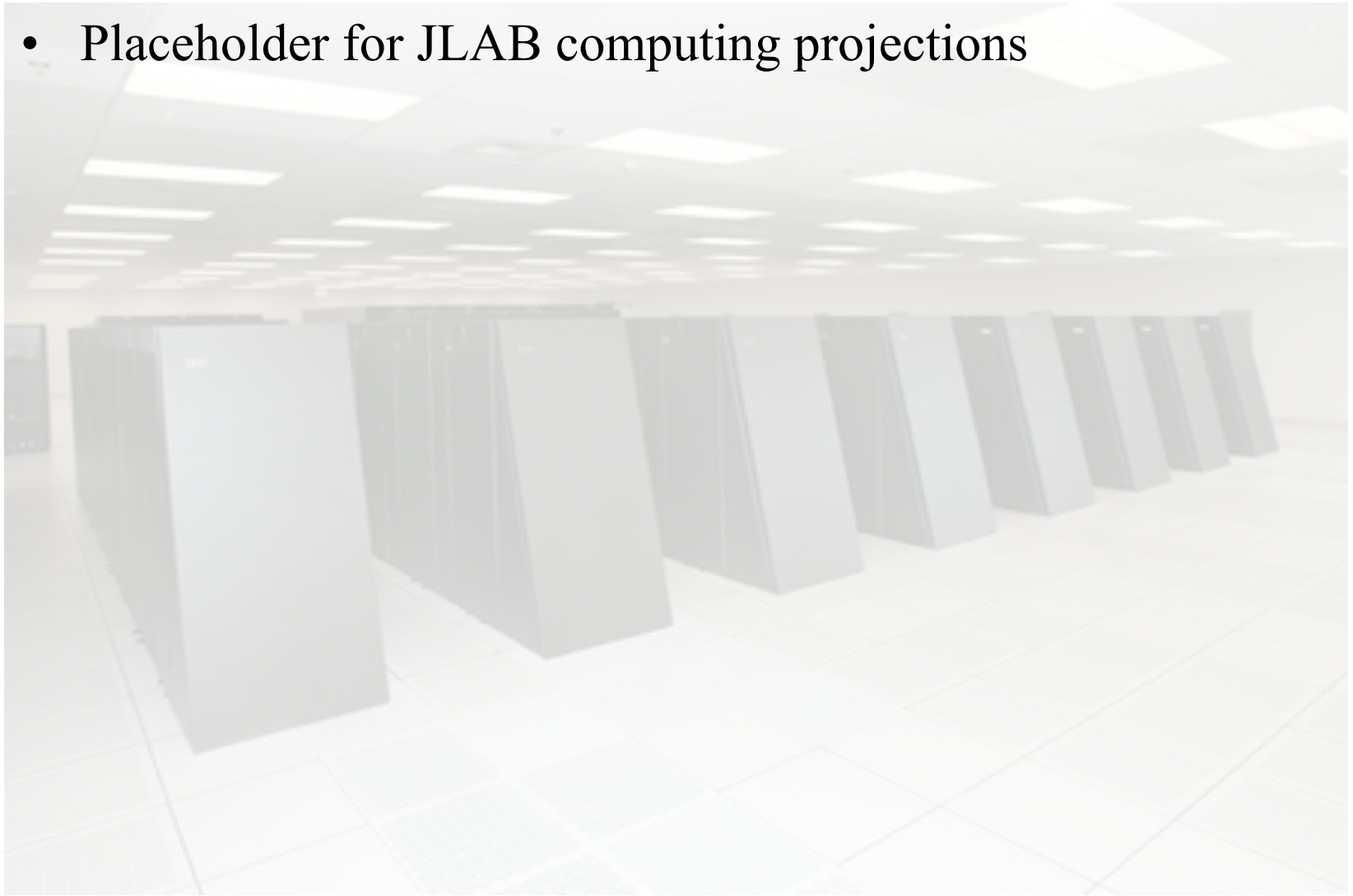
LHC Computing

- ALICE-USA
  - 2010 : 0.8 PB hpss, 4.0MSI2K, 1.0 PB
  - Divided between PDSF, OSC, TLC, LC
- CMS-HI (mostly US)
  - 2010 : 1.2 PB hpss, 4.0 MSI2K, 420 TB
- ATLAS-HI
  - TBD

Computing needed to deliver science at international facilities

JLAB Computing

- Placeholder for JLAB computing projections



More on computing in LRP

- GRID computing
  - opportunity to improve efficiency, leverage other facilities
  - partner with OSG on GRID tools, handling large data volumes
- Technology/Workforce benefits
  - Theory & Experiment both push state of the art computing, although in different ways, examples needed
  - Computing skills benefit industry
- Computing RHIC Theory
  - placeholder for RHIC Theory Upgrade

These topics to receive additional emphasis in 2007 LRP