PPDG and ATLAS

Particle Physics Data Grid
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ANL
ATLAS Software Week
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Basic Information on PPDG

- ✔ Born out of DOE call for R&D within the Next Generation Internet (NGI) program.
- ✔ To address the long-term data-management needs of HEP & NP using a pragmatic rapid deployment of storage and advanced network services of as a driver for longer-term R&D.
- ✔ Collaboration
  - CIT, ANL, LBNL, BNL, FNL, UF, SDSC, SLAC, JLAB, & UW
  - Physicists and Computer Scientists

Project Goals

- ✔ Using a strategic vision of "grid-enabled" data management and access for HENP the specific goals are:
  - Design, develop, and deploy network and middleware infrastructure capable of supporting data analysis and data flow patterns common to typical HENP experiments.
  - Adapt experiment specific software to operate in this wide-area environment and to exploit this infrastructure
- ✔ Implementation strategy via deployment of two critical services
  - High-speed site-to-site File Replication Service
  - Multi-Site Cached File Access Service

Tools employed

- ✔ HENP Grand Challenge project on data management: http://www-rnc.lbl.gov/GC/
- ✔ Globus Project: http://www.globus.org/
- ✔ Storage Request Broker: http://www.npaci.edu/DICE/SRB/index.html
- ✔ Netlogger: http://www-didc.lbl.gov/NetLogger/
- ✔ PingER: Internet response and packet loss monitoring and reporting tools, http://www-iepm.slac.stanford.edu/pinger
- ✔ Surveyor: Program for the deployment of dedicated internet monitoring hardware, http://www.advanced.org/surveyor/
- ✔ SAM: Sequential Access via Metadata, http://d0ora2.fnal.gov/sam/
- ✔ Condor Project, High Throughput Computing, http://www.cs.wisc.edu/condor/
- ✔ sfcp: Secure Fast CoPy, http://www.slac.stanford.edu/~abh/sfcp/

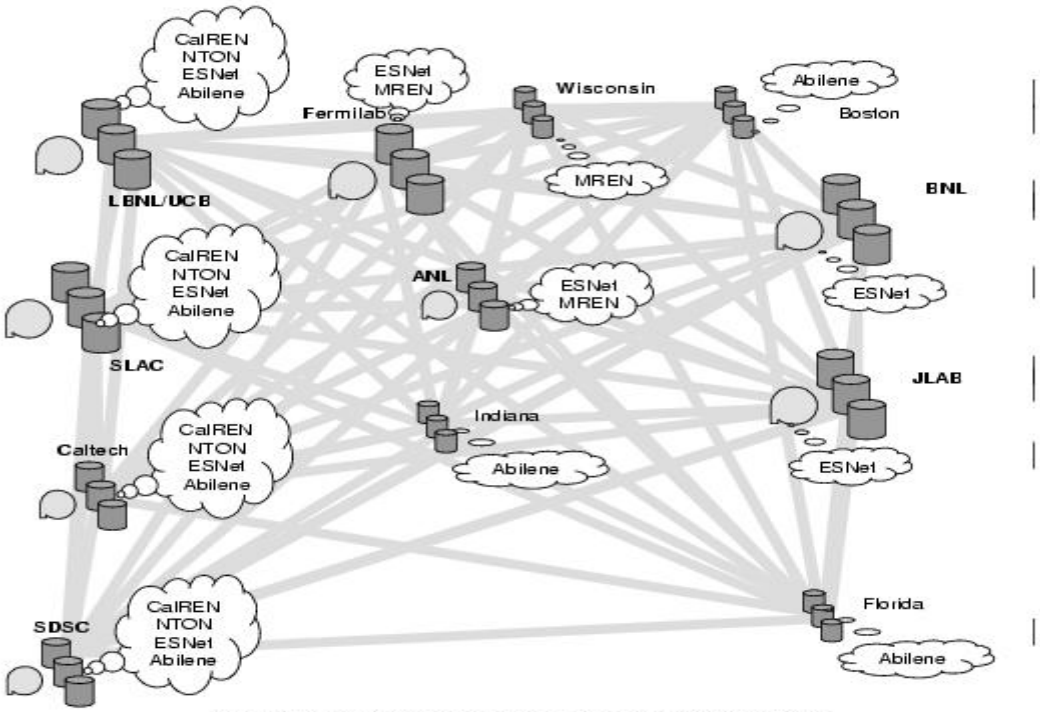


Figure 1: Sites participating in PPDG and GriPhyN/LHC (PPDG sites are in bold). The gray lines indicate the global access to data that is the goal of the PPDG. CERN and CCIN2P3 Lyon are also collaborating with PPDG members

Workplan

- ✔Deploying PPDG Services
- ✔Tests and Demonstrations
- ✔Development of architecture and tools

Deploying PPDG Services

- ✔ ATLAS US access to testbeam and MC data
- ✔ CMS simulation data access
- ✔ CDF run 2 data access for LBL
- ✔ Dzero MC data access
- ✔ BaBar Data replication at IN2P3 Lyon
- ✔ STAR data replication between BNL and LBL
- ✔ CLAS replication and caching from JLAB

Network Testbeds

- ✔ Principal Testbeds
  - NTON
  - ESnet testbed
- ✔ Local Infrastructure
  - High performance LANs and Host interfaces
  - Experts
- ✔ Network Measurement
  - real time network monitoring
  - application instrumentation

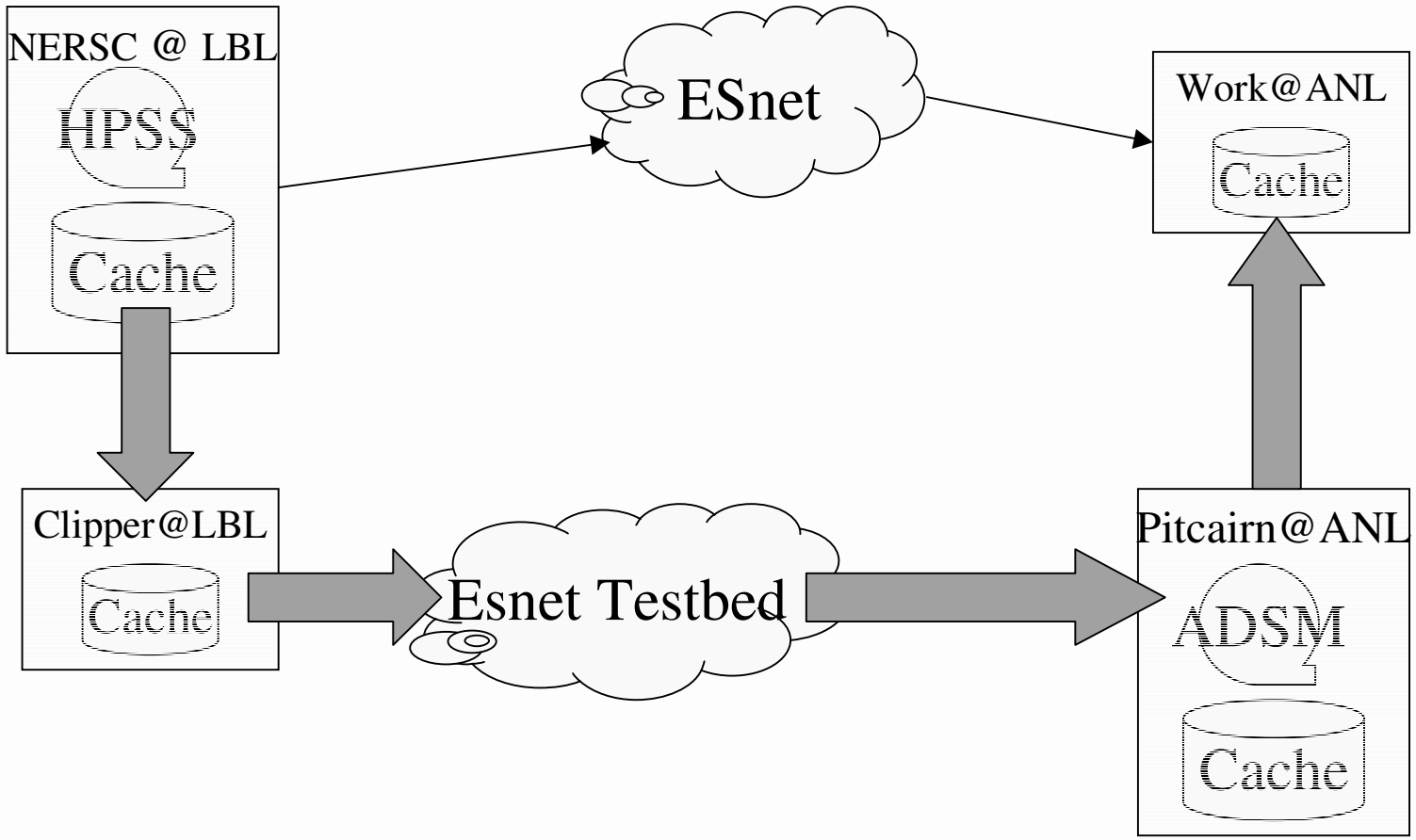
Development of Architecture and Tools

- ✔ Develop and deliver a robust , high performance set of replica catalog and data movement functions, and an API for programs to access the replica catalog.
- ✔ Network aware meta data cataloging
- ✔ Based on continuing development of the SRB, HRM, GLOBUS,… tools
- ✔ Continued development of network monitoring tools (eg NetLogger) and interfaces to network performance information sources such as MDS, NWS to allow smart decision making on data movement.
- ✔ High speed data transfer based on using DPSS with HPSS

Why a part of ATLAS

- ✔ ATLAS will make extensive use of world-wide distributed computing resources.
- ✔ The GRID will provide a uniform and transparent interface to the use of these resources.
- ✔ Current or expected networks and network testbeds in the US over next few years will provide a model environment comparable to international networks at LHC turn-on.

Testbed for ATLAS Tilecal Database Build and Replication

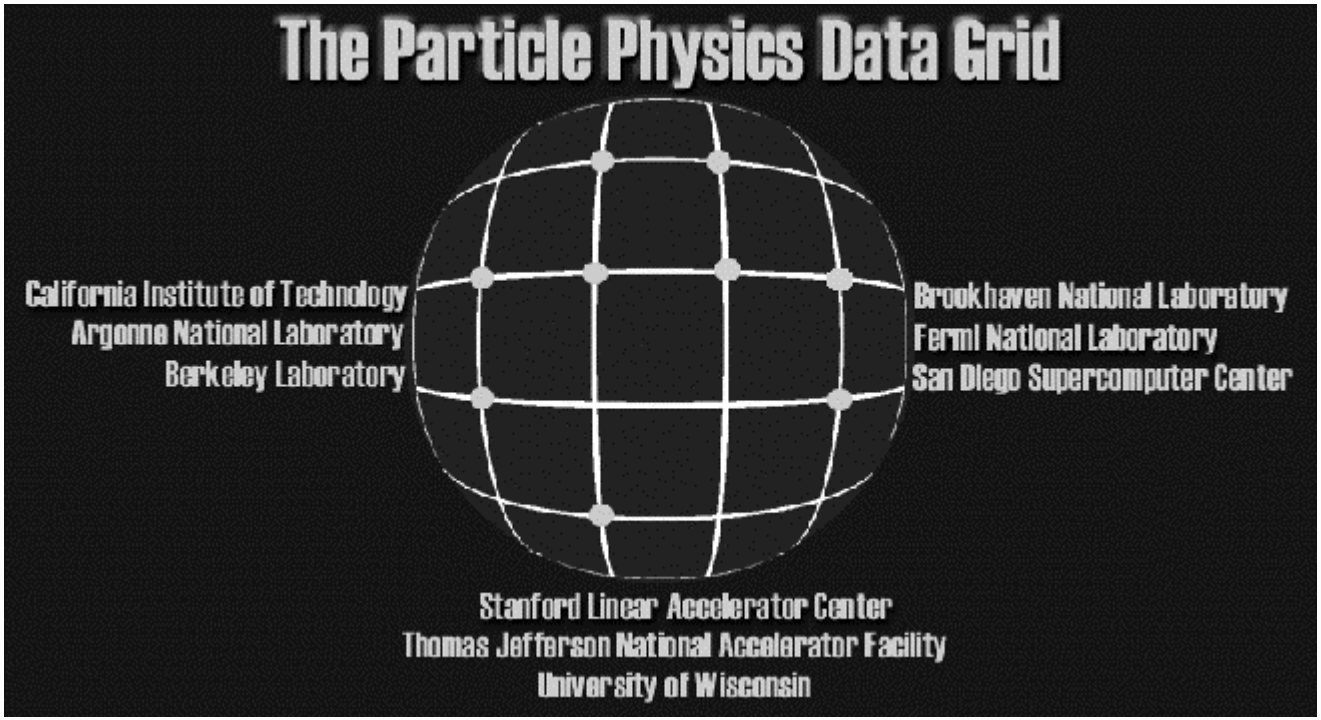


Test-bed

- ✔ ATLAS specific test-bed using US sites
  - ANL, BNL, LBNL, BU, IU, Michigan, …
  - Physical and Logical organization
  - Software (GLOBUS,...
  - When and how to connect to EUGrid based facilities.
- ✔ Initial prototype projects and demonstrations
  - Tile Calorimeter test-beam data analysis
  - ATLAS G4 based Simulation system
- ✔ How and when to use with ATLAS Athena framework.

Logo from PPDG Webpage

http://www.cacr.caltech.edu/ppdg/



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