

# US ATLAS Tier 3 Status

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# Tier 3 overview

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- ▶ **42 US ATLAS institutions, 44 potential Tier 3 sites**
  - ▶ One at ANL ASC (small) and One at a non US ATLAS institution
- ▶ **> 25 are already operational**
  - ▶ Many fetch data using dq2-get client
  - ▶ Will try to encourage more to setup gridftp server
    - ▶ Do not expect much gridftp usage until:
      - data volume to Tier 3 grows
      - dq2-get bandwidth is limited
      - Can get subscriptions to gridftp only end point
- ▶ **Expect another 10 sites to come on with 2 months or so**

# Tier 3 overview(2)

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- ▶ Tier 3 sites are varied
  - ▶ Several batch systems used
    - ▶ Torque/Maui
    - ▶ Condor
    - ▶ Proof (2 sites)
  - ▶ Various storage
    - ▶ Storage on work nodes
    - ▶ Storage in separate storage nodes
    - ▶ NFS
    - ▶ Xrootd
    - ▶ Local file systems
  - ▶ Since T3's are a local resource – need to adapt to their varied nature - implies support will be a challenge

# Scale of Tier 3 sites

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- ▶ Expect in the end ~ 40 Tier 3's in US
- ▶ Decent number of cores/ disk space available to analysis
  - ▶ 3476 cores (excluding SMU (1600 cores) Bell. U. (384))
  - ▶ 2394 TB (excluding SMU (440 TB) Bell. U. (376))
  - ▶ Average >133 cores and >92 TB
- ▶ WAN connectivity is all over the map.
- ▶ Amount of available support personnel is low
  - ▶ Some sites have access to dedicated system admin
  - ▶ Some sites the physicists are the system admin
    - ▶ Implications on physics productivity

# Tools at Tier 3

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- ▶ Strong reliance still on user tools for DDM transfers
  - ▶ Users like dq2-get
- ▶ ATLAS has modified the DDM client tools to aid in the Tier 3 sites
- ▶ Xrootd
  - ▶ Many Tier 3 sites are now using xrootd
  - ▶ Not clear how many will want to be federated initially
- ▶ Tier 3 Panda
  - ▶ New sites do not seem to be too interested in Tier 3 Panda
  - ▶ Not sure why? Guess- users do not see the need to connect to a central service to connect to local batch systems
- ▶ Tier 3 Monitoring
  - ▶ Effort established between ATLAS, US ATLAS and CERN IT
  - ▶ Will be useful beyond ATLAS. Initial plan documented
  - ▶ Need to use standard tools (like Dashboard) to make problem tractable
  - ▶ Do need to have local job monitoring (Proof or local batch)
    - ▶ Both Tier 3 Panda and Ganga could help here (We should officially support Ganga Frontend in US)
    - ▶ Should Drive towards a common frontend for grid/non grid usage

# CVMFS status

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- ▶ CVMFS has evolved beyond just a tool for Tier 3's
- ▶ Migrating to a production service within CERN IT
- ▶ Prior to migration:
  - ▶ Setting up test instances of CVMFS servers to server
    - ▶ software/DB releases
      - Software installed using Alessandro DeSalvo's scripts like the grid
    - ▶ All conditions data base flat files
      - Files in AFS straight forward
      - Files only DDM much harder do not have a solution yet
    - ▶ Nightly releases
    - ▶ Tier 3 UI (ATLASLocalRootBase)
  - ▶ Structure of CVMFS repositories being reorganized to follow existing ATLAS software structure on the grid
  - ▶ Expect to have results by April meeting.  
DB coordinating with Asoka De Silva and DB is the worker bee

# Tier 3's and analysis

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- ▶ Analysis is continuing to ramp up in ATLAS
  - ▶ 2011 should be a banner year for ANALYSIS in the US
  - ▶ Rik Yoshida and Jim Cochran are actively reorganizing the analysis support effort in the US
    - ▶ Tier 3 sites are part of the analysis puzzle for most people
- ▶ Tier 3 configuration and design must continue to evolve make analysis easier for users
  - ▶ Proof farms are a good example (SLAC and BNL)
    - ▶ Need to make it easier for anyone to setup a proof cluster on top of their existing resources
  - ▶ Xrootd Federation
    - ▶ Data analysis drive data transfers

# Conclusions

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- ▶ Prediction 2011 – value of the Tier 3 sites will be apparent
- ▶ Increasing data implies increasing analysis
  - ▶ plots shown yesterday are proof of this
- ▶ Tier 3's must adapt to how people using the computing
  - ▶ For example the rise in the number of Proof clusters
- ▶ They must be efficient in analysis
  - ▶ Xrootd should help here a great deal
  - ▶ improved monitoring of jobs should also help