ATLAS Tier3 workshop at the
OSG all-hand meeting

ATLAS EXPERIMENT

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http://atlas.web.cern.ch/Atlas/public/EVTDISPLAY/events.html

ATLAS Tier3 workshop

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What is a Tier3?

- Working definition
  - "Non pledged resources"
  - "Analysis facilities" at your University/Institute/...
- Tier3 level
  - The name suggests that it is another layer continuing the hierarchy after Tier0, Tier1s, Tier2s...
    - Probably truly misleading...
    - Qualitative difference here:
      - **Final analysis vs simulation and reconstruction**
      - **Local control vs ATLAS central control**
      - **Operation load more on local resources (i.e. people) than on the central team (i.e. other people)**

What is a Tier3?

- Comments:
  - No concept of size (small Tier3 vs big Tier2...)
  - Tier3s can serve (and be controlled by) a subset of the ATLAS collaboration (local or regional users).
  - At this stage there are no constrains of quality of service offered to the collaboration (or services at all, since a Tier3 could be used only by the physicists at the corresponding university)

- *Non-pledged* resources does not mean *uncontrolled or incoherent*
  - Need to provide a **coherent** model (across ATLAS)
    - Small set of template to be followed while setting up a Tier3 for ATLAS users.

Tier3: interesting features

- Key characteristics (issues, interesting problems)
    - Operations
        - Must be simple (for the local team)
        - Must not affect the rest of the system (hence central operations)
    - Data management
        - Again simplicity
        - Different access pattern (analysis)
            - I/O bound, iterative/interactive
            - More ROOT-based analysis (PROOF?)
            - Truly local usage
        - "Performances"

Tier3

- Of course the recipe *Tier3 = (small) Tier2* could make sense in several cases

- But in several other cases:

  - Too heavy for small new sites

    - "Human cost"
    - The new model is appealing for small Tier2-like centre as well

- In <u>all</u> cases:

  - Got the first collisions!   The focus is more and more on doing the analysis than supporting computing facilities ;)

What is the difference between a Tier2 and a Tier3?

- Independently from the magic recipes for building and operating a successful ATLAS Tier3, we should consider the following directions:

    - Maintaining **grid services** vs using **grid clients**
    - Tier3 as am **independent layer**   (with respect of the T0/T1/T2 infrastructure)

- With the goal to guarantee:

    - Simpler and smoother (central) operations
    - Development point of view: Tier3s can be seen as an incubator of new solutions for the whole system

Important points

- Need of an [ATLAS Tier3 model](#)
  - Build on top of the US ATLAS Tier3 initiative and experience
    - Copy the good ideas!
    - Make it ATLAS-wide!
  - Status:
    - Working groups
    - Prototype sites

ATLAS Tier3 workshop

- 25-26 January 2010 at CERN
  - http://indico.cern.ch/conferenceDisplay.py?confId=7705
  - More than 70 participants from ATLAS
- 13 presentations only on plans/experience
  - more than 1 per cloud, here the granularity is more "country"
  - Typically T3 is a single experiment facility
    - Notable exceptions: **DESY** and **Lyon** analysis facilities (NAF and LAF)
- All main aspects of the problem discussed
  - Data management (file, sw, cond files, dbs), job distribution (PanDA, ganga/pathena, PROOF)

→ 6 working groups

- **Distributed storage (Lustre/Xrootd/GPFS)**
  - Rob Gardner (Chicago) and Santiago Gonz Hoz (Valencia)

- **DDM-Tier3 link**
  - Simone Campana (CERN)

- **Tier 3 Support**
  - Dan van der Ster (CERN)

- **PROOF Working Group**
  - Wolfgang Ehrenfeld (DESY) and Neng Xu (Wiscosin)

- **Software / Conditions data Working**
  - Alessandro de Salvo (INFN Roma) and Asoka da Silva

Status report
In this workshop

Please note!

Project metrics

- We would like to demonstrate one (a few) viable models for ATLAS Tier3

- The criteria are:

  1) **Performance** (analysis work)

  2) **Maintainability** (small local system management effort)

  3) **Sustainability** (small and understood implication on central operations)

  - N.B. Importance: 3 > 2 > 1

- Testbed!

  - Set up of an ATLAS Tier3 community which can

How to attach a number to it?

- ## Performance

  - Analysis jobs

    - Reliability [(tot-err)/err]

    - Efficiency [CPU/Elapsed]

    - HammerCloud can do the job (at least for PanDA – need a local PF? Is a cron enough?)

- ## Maintainability (local effort)

  - Measure the effort ???

    - Stability over several weeks (HC)

    - Feedback (questionnaire)

- ## Sustainability (global effort)

 - Experience of the central team

Personal notes

- I am in favour to start with the most simplified model:

  - Each Tier3 download the data they want and they have full responsibility (consistency, deletion, etc...)

  - The catalogue is the Tier3 "file system"

    - At this point this is not "advertised"

    - Compatible with PanDA (recent development) and local submission (includes Ganga with the local back-end, say LSF)

  - Most of the central load will be DAST oriented (User Support)

    - Assuming the Tier3 community is "closer" to the final users one than to the grid folks

Boring?

- Tier3-Tier3 data exchange
  - Possible across xrootd implementations
    - Desirable! Useful? Does it work for us?!?

- PROOF analysis
  - At least for ntuple scan... Unclear situation (investment) for Athena analysis (at least unclear to me)
    - Desirable! Useful? Does it work for us?!?

- For these things (and others):
  - Indispensable to have ATLAS first-hand experience!

System boundaries

Data storage technologies: xrootd, distr, file systems, dpm (no srm), …
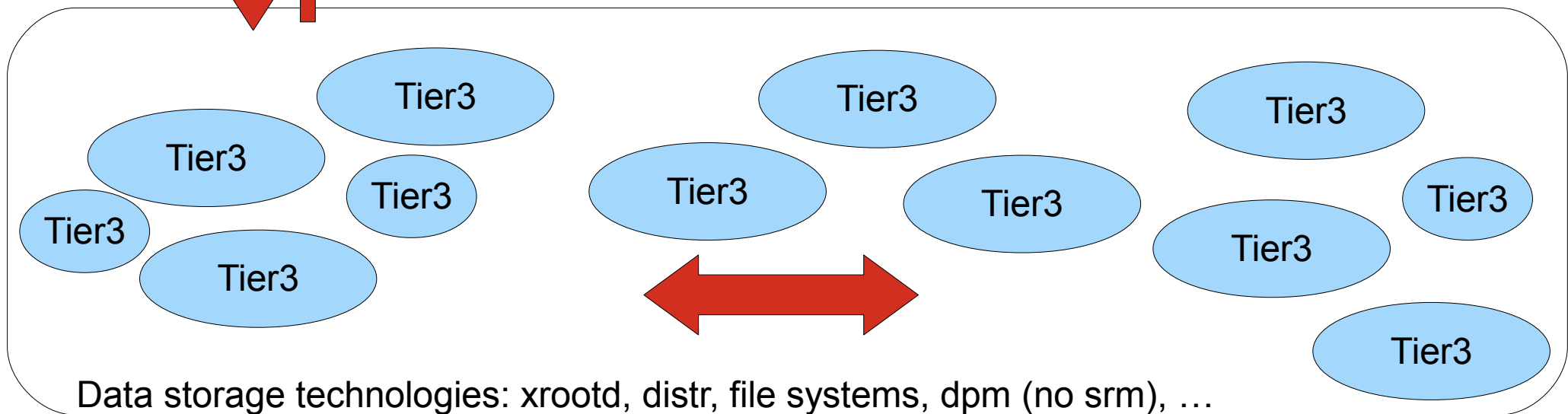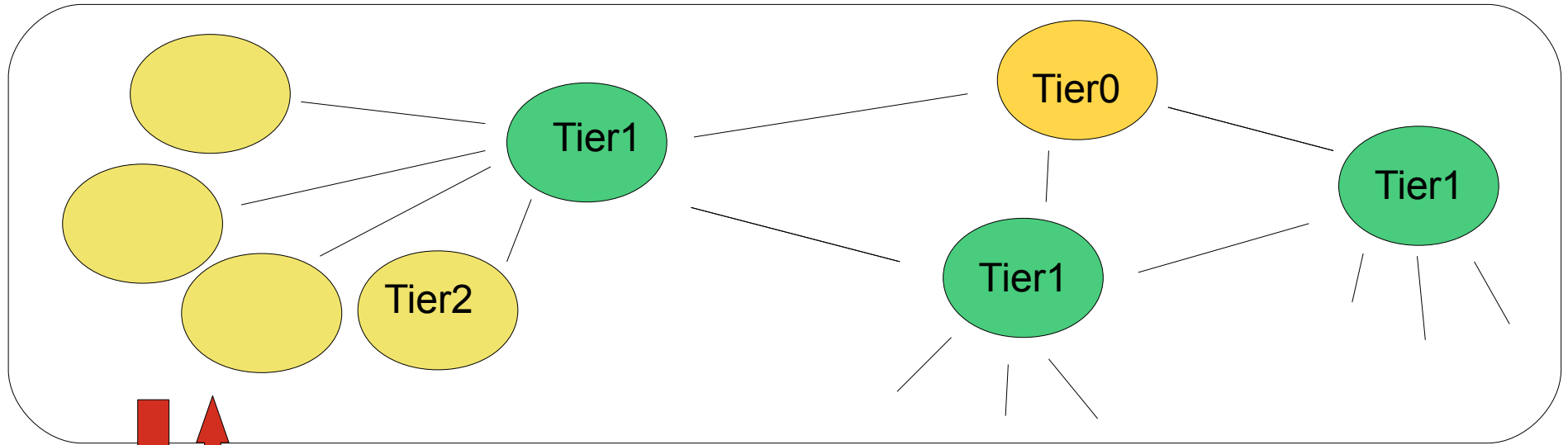
Next stop?

- ATLAS SW week: CERN (April 19-23)