

IU ATLAS COMPUTING PROGRESS AND GRID WORK

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- IU Personnel
- IU TRT & Core ATLAS SW Work
- Tier 2 Computing
- GRID Operations Work
- Plans for Tier 3 Facility at IU & Cooperation with D0

While most of this work is funded outside of the DOE base grant, it provides a great infrastructure to for doing ATLAS physics analysis.

Abbreviation Cheat Sheet

- In case you get lost - here is a cheat sheet:
 - iVDGL International Virtual Data Grid Laboratory
 - NSF funded grid project that is just now ending
 - kSi2k kilo-SpecINT 2000
 - A measurement unit of hardware computation power. Current CPUs are typically between 1.5 and 2.5 kSi2k per CPU core.
 - MWT2 - Midwest Tier 2
 - The joint University of Chicago Indiana University ATLAS Tier 2
 - OSG Open Science Grid
 - New US based grid effort soon to receive its first funding

IU SW and Grid Work Areas

- IU is working in four Software / Grid areas:
 1. Simulation/Reconstruction/Analysis software for Atlas
 - Most of this work is covered in Pauline's talk.
 2. Core Atlas Software
 3. MWT2 Tier 2 Center Operation
 4. OSG Grid Operations
- Funding Sources (next year):
 - NSF Midwest Tier 2 (MWT2) funding \$287k
 - NSF International Virtual Data Grid Laboratory (iVDGL) Grid Operations funding \$210k (bridging funds until OSG funding).
 - OSG funding of ~\$500k/year is expected starting "soon".
 - US ATLAS Project (thru BNL) for Tracking/Athena usability \$83k
 - IU iVDGL match ~1.25 FTE/year
 - Match for OSG money still to be determined.
 - IU MWT2 match ~0.67 FTE/year

ATLAS Software Personnel

- Vivek Jain, Research Associate US ATLAS BNL funds
 - More details on next page.
- Thom Sulanke, System Administration IU funds
 - Supports all local HEP computers within the Physics Dept.
 - Shared with other DOE tasks also.

Vivek Jain



- New hire funded by US ATLAS Computing project
 - This is US ATLAS Project funding - support does not come from the DOE base funding.
 - Senior physicist spent the last few years working on D0.
 - Convener of D0 B physics group. Worked on many topics including B_s mixing.
 - Worked previously at CLEO and fixed target experiments at FNAL and BNL.
 - Strengthens the ability of the IU group to do physics analysis.
- Vivek's responsibilities:
 - 50% FTE for Athena usability & US user support
 - Athena testing and validation to ensure that data productions are not spoiled by undetected bugs.
 - Give tutorials (at US facilities) on using Athena.
 - 50% FTE for tracking related projects
 - Described in Pauline's talk.

Tier 2 (MWT2) Personnel

- Matt Allen, System Administrator IU
 - Maintains prototype Tier 2 center on IU's AVIDD cluster.
 - Works as needed on project.
- Kristy Kallback-Rose, Princ. Systems Analyst, NSF/IU
 - Leads technical effort on IU & UC components of MWT2.
 - Previously worked on grids at IU before leaving to get her masters degree in quantum optics.
- Dan Schrager, Systems Analyst Programmer, NSF
 - Focused on system administration and grid middleware.
 - Worked on LCG and ATLAS software at Tel Aviv & Weizmann institute.

Grid Operations Personnel

- Leigh Grundhoefer, Sr. Grid Technologist iVDGL/IU
 - OSG Operations Coordinator
- John Rosheck, Unix Server Administrator IU
 - Administers server computers used by grid ops
- Rob Quick, Senior Grid Analyst IU/iVDGL/OSG
 - Central contact for OSG GOC and iGOC
- Tim Silvers, Operator iVDGL/OSG
 - Central contact for OSG GOC
- Kyle Gross, iVDGL
 - Works on OSG web pages and documentation.
- GOC Pool Position, Operator OSG
 - Will work on technical aspects of Grid Operations for OSG

TRT and Core SW Work

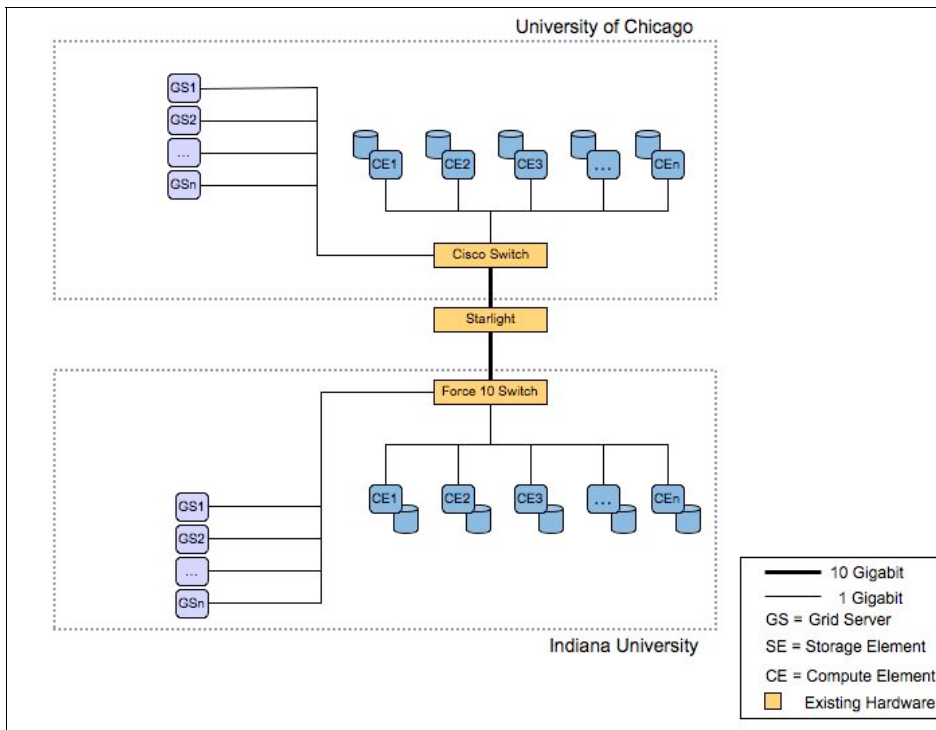
- My work is on coordination:
 - Coordinating the TRT & Inner Detector Software Effort
 - Managed the Inner Detector SW repository (librarian)
 - Assisted coordination of the Inner Detector SW
 - Chaired the ATLAS TRT SW group in the past and will be a co-chair of this effort in the future.
 - Chairing the ATLAS Software Infrastructure Team (SIT)
 - The most important (though far from only) responsibility of the SIT is build and distribute the ATLAS offline software (Athena).
 - I have lead SIT through a series of reviews in the past two years
 - This work is in close cooperation with David Quarrie (LBL)
 - Recently agreed to continue chairing the SIT activity for two more years (i.e. through the ATLAS turn-on).

Tier 2 Work

- Prototype Tier 2 Center operation
 - IU provided a prototype Tier 2 center with 64 2.4 GHz Xeon CPUs and about 10 TB of storage (mostly IU contributions).
 - Participation in Grid3 for Atlas DC2 & Rome data production.
 - Fully converted from Grid3 to OSG Grid middleware
 - Participation in current ATLAS Monte Carlo production.
- Successful proposal for Midwest Tier 2 (MWT2)
 - Partnership with University of Chicago.
 - IU ATLAS and IU D0 will share rack space.
 - The first MWT2 hardware arrives within a month:
 - 100 kSi2k CPU power (~200 kSi2k by the end of the year).
 - 40 TB storage (~60 TB by the end of the year).
 - A 10 Gbps connection between IU & UC as well as to the outside.

MWT2 Plans

Drawing by Kristy
Kallback-Rose



Tier 2 Future

- By 2009, the MWT2 (UC and IU combined) will have:
 - ~1000 kSi2k of dedicated computational power
 - ~800 TB of dedicated storage
 - Outside connectivity will be at least the 10 Gbps that is currently be connected.
- In addition there will be leveraged usage of:
 - A large number of UC & IU CPUs
 - Storage at at UC & IU
 - High Performance Storage System (HPSS) at IU
- D0 is installing 9 nodes in the MWT2 (for B Physics).
 - These nodes can be used by ATLAS when they are not being used by D0.

Open Science Grid

- IU has a leading role in Open Science Grid (OSG)
 - We played a big part in the successful launch of the OSG.
 - We have been part of the successful OSG proposal.
 - Bridging funding from iVDGL is in place to carry the OSG operations along until the OSG money arrives.
 - Reduced funding from OSG will be received the first year because of the iVDGL bridging funds.
- The US is now committed to using the OSG to analyze ATLAS and CMS data.
 - Almost all official, large scale data production in the US by ATLAS and CMS is done using OSG.

GRID Operations Work at IU

- Work over the past 3 years:
 - Handled thousands of trouble tickets IVDGL, & OSG.
 - Did much of the OSG installation testing, instructions, debugging, and web pages.
- Work in the future:
 - OSG Grid Operations Center (using IU's Global Research Network Operations Center).
 - OSG middleware installation testing, instructions, debugging, and web pages.

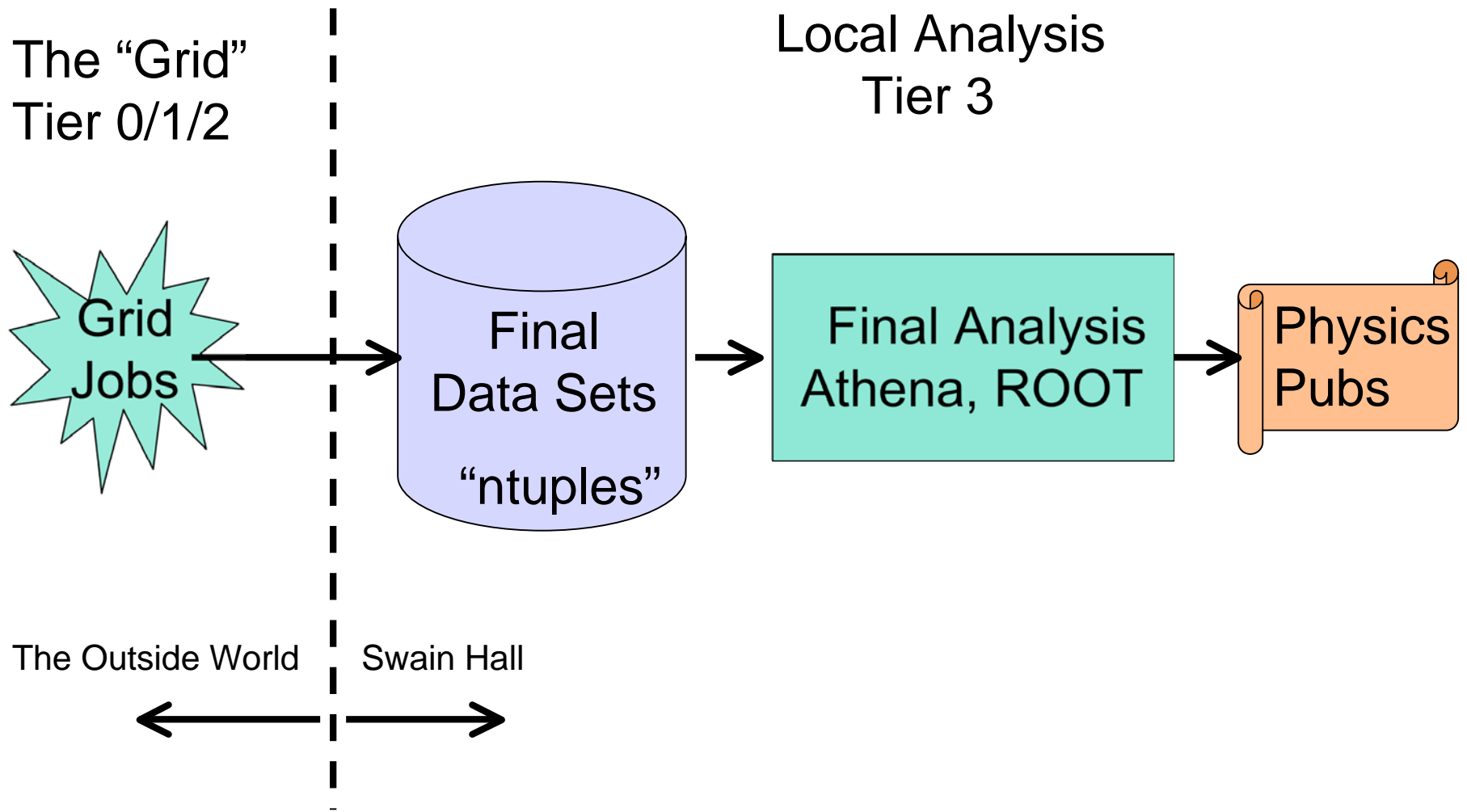


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ATLAS Computing and Grid Work

Analyzing ATLAS Data Locally at IU



Tier 3 site at IU

- How to analyze ATLAS data locally here at IU?
 - Need to analyze “ntuple” data created at Tier 0/1/2 locally with a short turn around time.
 - So we plan to build incrementally upon existing computer infrastructure and support personnel.
- What do we have now and how should it grow?
 - IU will establish an ATLAS Tier 3 site using existing and new workstations.
 - We have a modest request for ~2 new workstations and ~4 TB of storage each year.
 - Some D0 workstations will be part of the cluster.
 - These workstations and raid arrays combined with the existing ATLAS computers will form the Tier 3 site.
 - Thom Sulanke with help from us will maintain this facility.

Summary

- Over the past three years:
 - We have built a team of 9 people working on ATLAS software, the Midwest Tier 2 center, and iVDGL/OSG grid operations.
 - We have taken a leadership role in both ATLAS core software as well as for the TRT and Inner Detector.
 - We have contributed significantly to all major ATLAS Monte Carlo data productions.
 - Taken a leadership role in Operations and middleware distribution within Open Science Grid.
- During the next three years:
 - This infrastructure will support our physics analyses.
 - Fred and Vivek will help the group effectively use the infrastructure