

# Integration Program Update

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3-2-09




US ATLAS Tier 3 Workshop  
OSG All Hands @ LIGO












# Overview

- Phased program of work for the US ATLAS Facility
- Establishing a baseline set of deliverables that integrates fabric resources, ATLAS software and services, grid level services, operational components, and user tools
- Launched June 2007
  - Now in Phase 8
- Focus is primarily on US ATLAS Tier 1 and Tier 2 facilities with some participation from (Tier 2-like or Tier 2-satellite) Tier 3 sites
- <http://www.usatlas.bnl.gov/twiki/bin/view/Admins/IntegrationProgram.html>

# Integration Program - Tasks




## Phase 8 (Jan 1 - Mar 31, 2008 - FY09Q2)
































































Notation:  completed  work is in progress  defer to next phase

<u>WBS</u>	<u>Deliverable</u>	<u>Description</u>	<u>Major Milestones</u>	<u>Status</u>	<u>Resource</u>
1	P8	Integration Phase 8: deployment, validation			Staff, Tier1 + Tier2 centers
1.1	<a href="#">ATLAS releases</a>	ATLAS releases via Pacball & DDM	Mar 1		Xin, Fred, Torre
1.2	<a href="#">Fabric upgrades</a>	Compute and storage upgrades	Mar 31		Tier2
1.3	<a href="#">Network monitoring services</a>	US LHC network monitoring infrastructure: validation	Mar 1		Networking group
1.4	<a href="#">Bestman validation</a>	Validate OSG/VDT based Bestman	Feb 1		OU, SLAC, BU, UTA
1.5	<a href="#">Squid servers at Tier 2</a>	Conditions data access at Tier 2	Mar 1		SLAC, ...
1.6	<a href="#">Load tests 200/400 MB/s and multi-site 1 GB/s</a>	Read/write sustained BNL-Tier2	Mar 31		Networking group
1.7	<a href="#">Storage Validation</a>	Disk, LFC, DQ2 catalog validation	Mar 1		all sites
1.8	<a href="#">Site certification Table</a>	Site certification and benchmarks registered	Mar 31		all sites
1.9	<a href="#">Analysis Benchmarks</a>	Boxed analyses across sites	various		<a href="#">FacilityWGAP</a>
1.10	<a href="#">US ATLAS Facility clients</a>	US-specific support for various ATLAS and OSG clients for admins and physicists	on-going		Marco
1.11	<a href="#">Summary Report</a>	Summary report	Mar 31		all

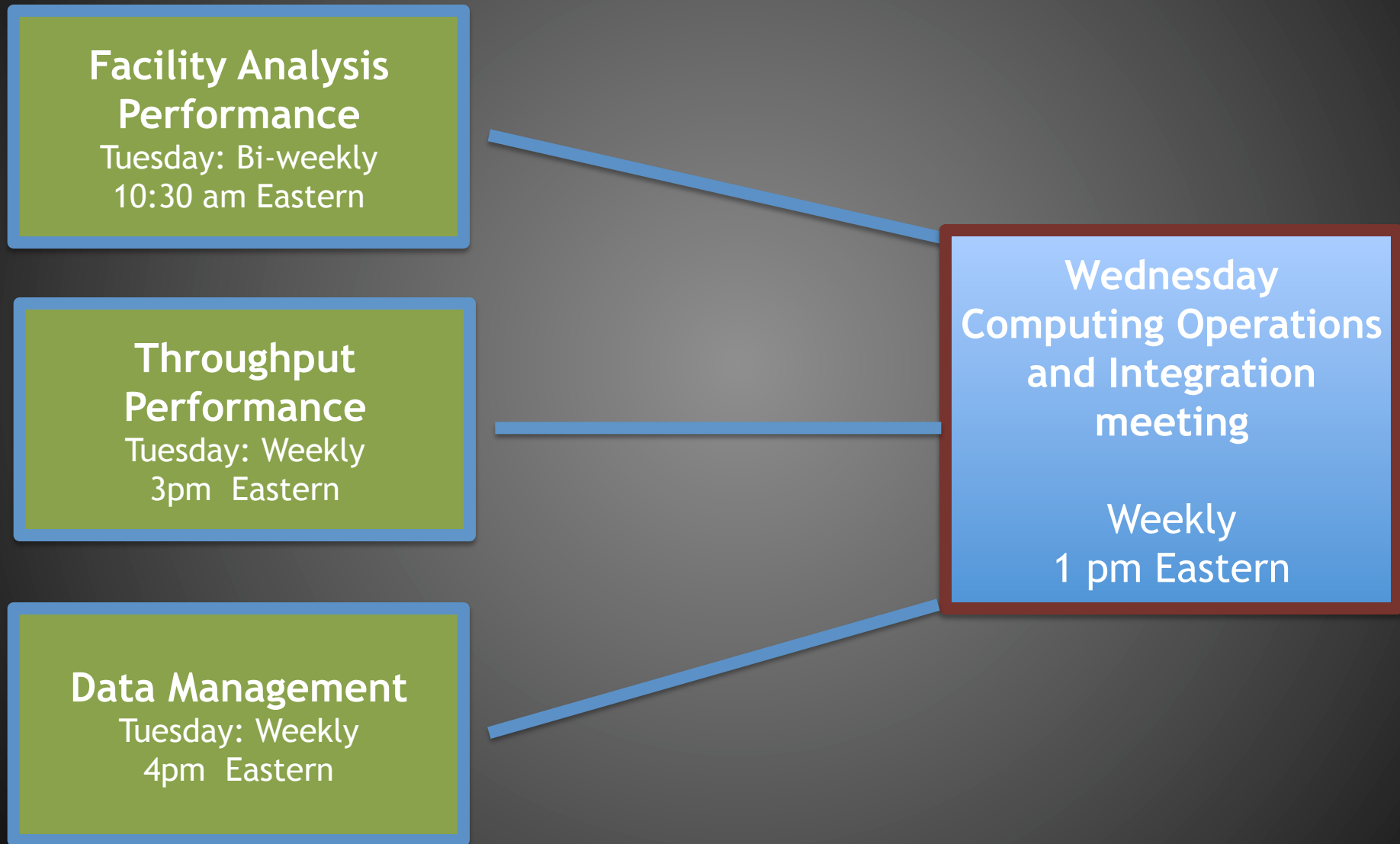
# Integration Program - Sites

- Phase 7 site certification table

Notation:  completed  work is in progress  defer to next phase

Site	Space Tokens (Oct 15 MS)	Fabric upgrades	NetworkMonitoring	LT: 200 MB/s	LT: 400 MB/s	AB 1	AB 2	AB 3	AB 4	FileCatalog	TuneRSV
TIER1											
AGLT2											
MWT2											
NET2											
SWT2											
WT2											

# Coordination



# Analysis Queue Performance

- Background
  - We are beginning to see Tier 2 analysis jobs that stress storage systems in ways unlike production jobs
  - Many analysis workflows
- General objectives
  - Support testing and validation of analysis queues
  - Address issues uncovered during functional tests in ATLAS
  - Measure analysis queue performance in a number of metrics
- Overarching goals
  - is to assess the facility readiness for analysis workloads in terms of
    - scale: response to large numbers of I/O intensive jobs
    - stability and reliability of supporting services (gatekeepers, doors, etc)
    - Physics-throughput (user's latency and efficiency)

# Working group

- Organized bi-weekly meeting with representatives from sites, software, operations, physics
- Not a general analysis user-support meeting
  - However will hear reports of user problems and track those indicating systematic problems in the infrastructure (facilities or distributed services)
- Feedback to site administrators, ADC development & operations



# Queue Metrics

- For a specified set of validated job archetypes...
  - DnPD making for Tier 3 export
  - TAG-based analysis for Tier 3 export
  - Others as appropriate
  - Data access methods
    - direct read from storage
    - copy to local work scratch
- ...define queue metrics such as:
  - Completion times for reference benchmarks
  - Local I/O access performance
  - Elapsed user response times for a reference job set
    - Submission to queued
    - Time in queue
    - Total elapsed to completion



# Measurement

- Measurement modality:
  - Regular testing (robot-like)
  - Stress testing
  - Response versus scale (for example, queue response to 10/100/200/500/1000 job sets of various types, I/O intensive) to determine breaking points
- Deliverables (preliminary)
  - March 15: Specify and test a well-defined set of job archetypes representing likely user analysis workflows hitting the analysis queues.
  - March 31: Specify set of queue metrics and test measurements made
  - April 15: Facility-wide set of metrics taken

# Throughput & Networking

- Led by Shawn
- Implement a consistent perfSONAR infrastructure for USATLAS
  - Include “mesh-like” testing between Tier-n sitesb.
  - Improve access to perfSONAR data (new frontpage for perfSONAR, Jay’s additions for graphing/display/monitoring)
- Document existing monitoring (Netflow, FTS, ATLAS dashboard, dCache monitoring)
- Implement standard dataset for disk-to-disk tests between BNL and the Tier-n sites
- Work with I2 and Esnet for dedicated T1-T2 circuits
- Continue establishing performance benchmarks
  - 200/400 MB/s T1→T2, >GB/sT1→multi-T2
- Iterate on all the above as needed

# Data Management

- Led by Kaushik
- Storage validation
  - Consistency checking filesystem $\leftrightarrow$ LFC $\leftrightarrow$ DQ2 catalog
  - Standardize cleanup tools & methods
- Storage reporting (ATLAS, WLCG)
- Data placement policies, token management and capacity planning
- Data deletion policies
- Data transfer problems
- Dataset distribution latency

# Challenge Summary (incomplete!)

- Analysis
  - Establishing performance at scale
  - Very dependent on storage services: developments in dCache, xrootd will be very important
- Throughput
  - Monitoring infrastructure and performance benchmarks
- Data management
  - Standardizing management tools and placement/deletion policies, capabilities, performance
- Tier 3
  - Exporting datasets to Tier 3s efficiently