ATLAS Experience With the LCG-1Testbed

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ATLAS expectations and plans towards Grid

- Data Challenges are crucial for future data taking and analysis
  - No way CERN computing resources can accommodate the task: **distributed** computing is unavoidable
  - Grid technologies are expected to **simplify** and **optimize** the tasks of distributed computing and data management
- ATLAS already used Grid systems in DC1:
  - *NorduGrid*: contribution grew from 2% in '02 to 15% in '03
  - *US Grid* (*Chimera*): contributed significantly in '03 (~5%)
  - *EDG Applications Testbed*: minor contribution in '03
- Ultimate desire: through the Grid, to have all the DC resources operating as one (or at least most of them)
  - Problem #1: different ownership and policies
  - Problem #2: different Grid middleware
- Would be great if LCG could solve these issues
  - DC2 will make use the LCG facilities as much as possible

LCG-1 testing: phase 1

- ATLAS-LCG task force was set up in September 2003
- October 13: allocated time slots on the LCG-1 Certification Testbed
  - Goal: validate ATLAS software functionality in the LCG environment and vice versa
  - 3 users authorized for the period of 1 week
  - Limitations: little disk space, slowish processors, short time slots (4 hours a day)
- ATLAS software (v6.0.4) deployed and validated
  - Single manual installation by a super-user on a shared file system
  - 10 smallest reconstruction input files replicated from CASTOR to the 5 SEs using the `edg-rm` tool
    - The tool is not suited for CASTOR timeouts
  - Standard reconstruction scripts modified to suit LCG
    - Script wrapping by users is unavoidable when managing input and output data (EDG middleware limitation)
  - Brokering tests of up to 40 jobs showed that the workload gets distributed correctly
  - Still, time was not enough to complete a single real production job

LCG-1 testing: phase 2

- The LCG-1 Production Testbed was meanwhile available for every registered user
  - A list of deployed User Interfaces was never advertised (though possible to dig out on the Web)
  - Inherited old ATLAS software release (v3.2.1) together with the EDG's LCFG installation system
- Simulation tests at the Production Testbed were possible
  - A single simulation input file replicated across the testbed
    - 1/3 of replication attempts failed due to wrong remote site credentials
  - A full simulation of 25 events submitted to the available sites
    - 2 attempts failed due to remote site misconfiguration
  - This test is expected to be a part of the LCG test suite
    - At the moment, LCG sites do not undergo routine validation
- New ATLAS s/w could not be installed promptly because it is not released as RPM
  - Interactions with EIS: define experiment s/w installation mechanisms
  - Status of common s/w is unclear (ROOT, POOL, GEANT4 etc)

LCG-1 testing: phase 3

- EDG Applications Testbed was re-opened on October 2
  - Deploys middleware "one step ahead" of the LCG-1 testbed
  - Despite implementational differences, no visible difference for non-advanced end-users (same functionality, same tools, same parlance)
  - Only 2 User Interfaces deployed, accounts have to be requested separately
- Attempts to repeat the reconstruction tests were made at the EDG Applications Testbed
  - File replication from CASTOR test repeated
    - Same timeout problems
    - General system instability prevented testing all the SEs
  - "Dummy" jobs to test brokering with input files
    - Matching is correct, but high failure rate due to the system instability
  - New ATLAS s/w could not be installed promptly because it is not released as RPM
- On November 3, the decision was taken to concentrate on the LCG-1 Production Testbed
  - EDG testbed seems to be developing multiple problems

LCG-1 testing: phase 4

- By November 10, a newer (not *newest*) ATLAS s/w release (v6.0.4) was deployed at the LCG-1 Production Testbed from tailored RPMs
  - PACMAN-mediated (non-RPM) software deployment is still in the testing state
  - Not all the sites authorize ATLAS users
  - 14 sites advertise ATLAS-6.0.4
  - Reconstruction tests are possible
- ATLAS s/w installation validated by a single-site simulation test
- File replication from CASTOR test repeated
  - 4 sites failed the test due to misconfiguration
- On November 12, there was a request to temporary suspend the tests due to unspecified testbed problems

Conclusions

- While there is a wealth of resources running EDG-based solutions, there is no single **stable** facility
    - Any site can turn out to be misconfigured
    - No clear picture of VO mappings to sites
    - System-wide experiment s/w deployment is a BIG issue, especially when it comes to 3d party s/w (e.g., that developed by the LCG's own Applications Area)
- The deployed middleware as of **today** does not meet production requirements
    - Some services are not fully developed (data management system, VOMS), others are crash-prone (WMS, Infosystem – from EDG)
    - User interfaces are not user-friendly (wrapper scripts are unavoidable, non-intuitive naming and behavior) – **very steep** learning curve
- LCG appears to be committed to resource expansion, middleware stabilization and user satisfaction
    - ATLAS is confident it will provide reliable services by DC2
    - EDG-based m/w has improved dramatically, but still imposes limitations
    - Better ways of interacting and collaborating with experiments are necessary: more manpower, better information circulation, tutorials etc