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Challenges in the adoption of the EGI paradigm for a e-Science/Tier-2 centre (ES-ATLAS-T2)

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Overview

The High Energy Physics community has reached during the last year great achievements with the run of the LHC (Large Hadron Collider) again and its obtaining first collisions on November 2009, and with a successful run at 7 GeV at the beginning of 2010.

In this contribution we present the current production ready infrastructure of the IFIC institute member of the Spanish ATLAS Tier2 (ES-ATLAS-T2) and report its response at different stages, from data taking to experimental results, and we describe the facilities for data analysis (Tier-3) set up at IFIC.

We will also present the processes being implemented to adopt the new situation with the EGI transition in its different phases, with the key requirement of being the less disruptive possible in the production operations and on the day-by-day end-user work. As a member of the EGI project it will be also presented the contributions to several activities in order to provide better and stable software at the end infrastructure.

Impact

This model and the IFIC prototype was previously presented in EGEE user Forums, and shown its validity for managing the Atlas data, but with the finalization of the EGEE project that was supporting the main software releases of gLite, new challenges and issues arise, including the risks of timeline releases and the availability of supporters. EGI project intends to continue supporting the production infrastructure, with a broader end-user community, but leaving middleware developments for outside providers, being the main one the releases from EMI (European Middleware Initiative).

It has been taken into account the key tools that are being used like DDM (Distributed Data Management), and Ganga, and how are they supported through the Services for HEP Heavy User Community in EGI.

The main impact would be that this activity provides continued support for activities currently supported by EGEE while they transition to a sustainable support model within their own community or within the production infrastructure. The support model for High Energy Physics will be described in the document MS603 –Services for High Energy Physics and made available in the next version of the present deliverable. In this way maybe the main impact will be the end of the lcg-CE to move on Cream. The proposal is that all sites supporting LHC experiments run CREAM and are no longer required to run LCG-CE for LHC.

Description of the work

The computing model of the ATLAS experiment at the LHC is based on a tiered hierarchy that ranges from Tier-0 (CERN) down to end-user's own resources (Tier-3). Levels 0 to 2 are well defined within the computing model and have been thoroughly tested in the last years. At Tier-0 takes place a first event reconstruction, the main purpose of the Tier-1s distributed all over the world is to reprocess and to carry out analysis that need

to access to huge amount of data and Tier-2s mainly take care of providing CPU and storage resources for the various physics groups' analysis and official Monte Carlo data production. Tier-3 sites are institution-level non-ATLAS funded that participate most frequently in support of the particular interests of local physicists.

In the case of ATLAS, the raw data coming from the detector is reconstructed to produce Event Summary Data (ESD) and Analysis Object Data (AOD) files. The ESD incorporates all of the information of the event reconstruction, and is mainly used for detector performance studies. The AOD contains only part of the information available in the ESD and is meant to be used for physics analyses. Data distribution and storage organization is based on space tokens. According to the Computing Model, these space tokens are controlled through the Distributed Data Management (DDM) system, which is working "a la GRID", and they are associated to a path to a Storage Element (SE).

This model is supported by the LCG project that sums up the participant institutes to provide a coherent production infrastructure with 3 grid flavors including gLite, OSG, and ARC. This model is going to change at the beginning of 2011 and the WLCG will decide which of them have the blessing for adoption.

The transition from EGEE to EGI is being done and for what affects to ATLAS the important issues are:

- Support for middleware and tools.
- Infrastructure support according to required levels.
- Not disturbing of current operations and end-users.

URL

<http://ific.uv.es/grid/e-science/>

<https://twiki.ific.uv.es/twiki/bin/view/Atlas/GridComputing>

Conclusions

The main conclusions would be:

- 1)LHC started again on Nov'09 and successfully reached 7 TeV.
- 2)IFIC is part of Spanish Tier-2, and defined its Tier-3 to fulfill ATLAS requirements. Computing and Storage resources are in place according to 2010 Pledges.
- 3)Common middleware services and operations are now supported by EGI IFIC Users submit its analysis jobs where data is, replicating most used datasets to local storage.
- 4)Various tools are used, some of them supported by EGI, being HEP a Heavy User Community: Ganga, Panda, DDM, Dashboards xrootd for interactive analysis, ...

Primary author: Dr GONZALEZ DE LA HOZ, Santiago (CSIC)

Co-authors: LAMAS, Alejandron (CSIC-IFIC-Valencia); FERNÁNDEZ CASANI, Alvaro (CSIC-IFIC-Valencia); OLIVER, Elena (CSIC-IFIC-Valencia); Dr AMORÓS, Gabriel (CSIC-IFIC-Valencia); SANCHEZ, Javier (CSIC-IFIC-Valencia); Dr SALT, Jose (CSIC-IFIC-Valencia); VILLAPLANA, Miguel (CSIC-IFIC-Valencia); Dr KACI, Mohammed (CSIC-IFIC-Valencia)

Presenter: Dr GONZALEZ DE LA HOZ, Santiago (CSIC)

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