ACAT 2010

Implementation of new WLCG services into the AliEn computing model of the ALICE experiment before the data-taking

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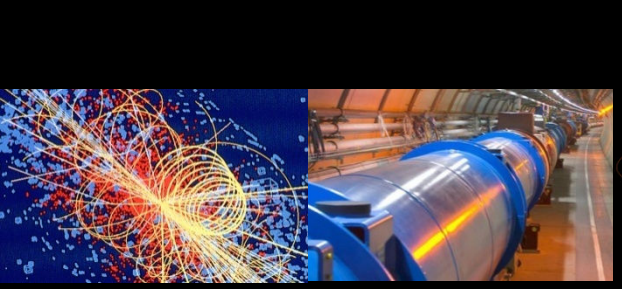
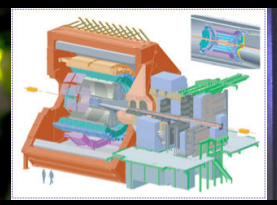
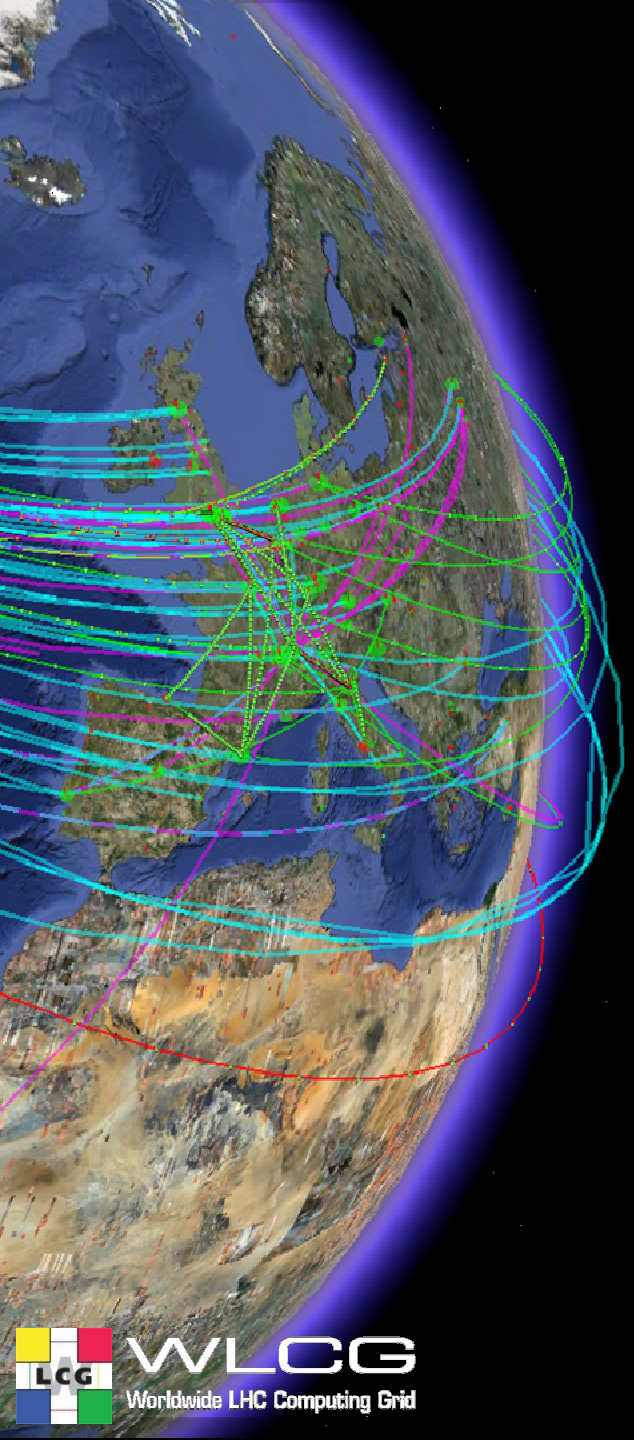



WLCG Worldwide LHC Computing Grid

ALICE



Overview

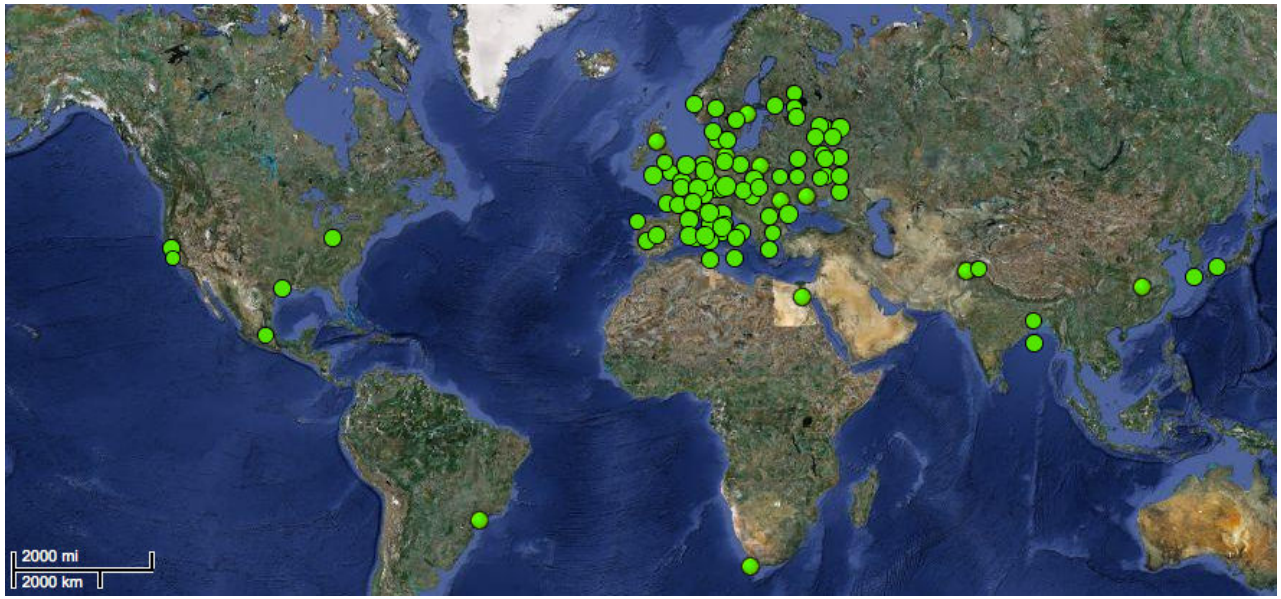
- ALICE in the world
- gLite3.2 WMS and VOBOXES
- The CREAM-CE
- 2009 Operations
- Future Plans

WLCG Worldwide LHC Computing Grid

ALICE

ALICE in the world

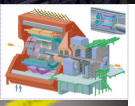
- About 90 sites distributed all over the world
  - Central Task Queue and Optimizers placed at CERN
    - Central DB of jobs to be executed
    - Optimizers split and arrange jobs according to input data, priority policies and/or user defined criteria
  - Experiment computing infrastructure able to submit to different middleware backend (gLite, OSG, ARC, local batch)



The gLite-VOBOX

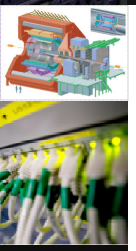
- What is the gLite-VOBOX?
  - Generic Grid service used by the LHC VOs
    - Designed to run specific experiment services
  - Created in 2006 by WLCG, **the VOBOX IS A UI** with two fundamental features
    - Automatic renewal of the user proxy – VO-box services requiring certificate authentication are always provided with valid credentials
    - Direct access to the shared software area, with access restricted to the VO-box administrator (VOMS role 'lcgadmin')
- Current version:
  - gLite3.2: 3rd version deployed in October in 2009
    - Service version (very) ALICE friendly
    - Last element included: gridftp server
      - To comply with the CREAM-CE requirements

The ALICE gLite-VOBOX

- ALICE requires a gLite VO-box at the sites providing resources to the experiment
  - Thin interface to site Grid services
  - Submits JobAgents to the site
  - Proxy management for the experiment services
- Uniform services
  - Same service layer is running at all (T0/T1/T2) sites
- Installation and maintenance of the
  - gLite VO-box
    - Site administrator's responsibility
  - ALICE services
    - Experiment's responsibility defined on a regional principle

ALICE experience with the gLite-VOBOX



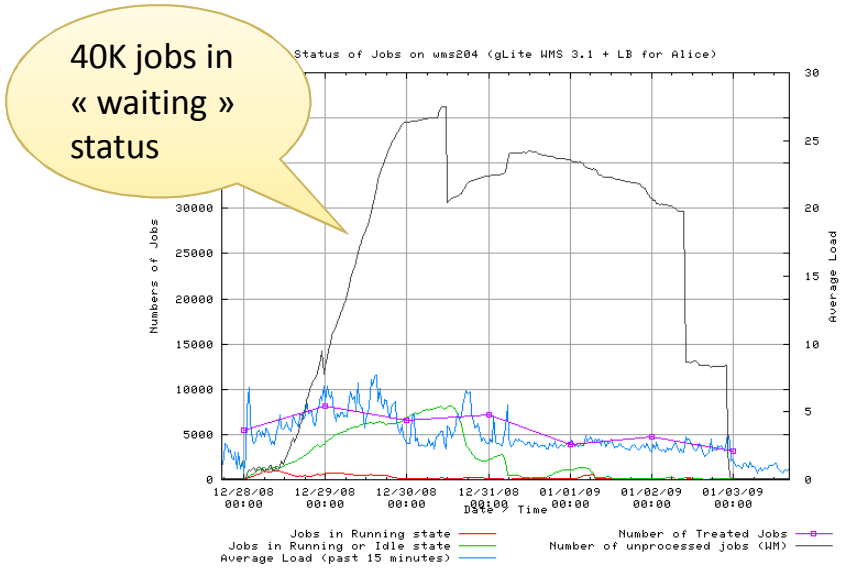
- ALICE is the LHC experiment with the largest number of gLite VO-boxes deployed all over the world
  - 60 gLite-VOBOXES in production
  - ALICE has became a driving force for the setup, testing and certification of new versions
- The latest gLite3.2 (generic) VOBOX was certified together by the Grid Deployment and the ALICE support teams at CERN
  - The most stable service used by ALICE
  - ALICE has a large experience managing and maintaining it

The gLite-WMS

- What is the gLite-WMS?
  - Generic gLite service used by the 4 LHC experiments
  - Fundamental features of the service:
    - Accept requests for job submission and management coming from its clients
    - Take appropriate actions to satisfy them
- Current version: gLite3.2 deployed before Summer 2009 and validated by ALICE while still in pre-production
  - Positive feedback of this new version provided by ALICE
- ALICE and the gLite-WMS
  - Around 20 gLite-WMS in production
    - Up to 3-4 WMS used to submit to each site, regional submission principle
    - For all sites, the CERN WMS are defined as backup solutions
      - Large number of dedicated WMS for ALICE with a remarkable stability and support
  - WMS is used to submit to the LCG-CE ONLY
    - It allows the submission to the CREAM-CE, not used by ALICE

ALICE experience with the gLite-WMS

- Issues and remedies for gLite3.0 and gLite3.1 versions
  - 2008 - 2009 Christmas time
    - WMS internal queue backlogs, slowing new requests to the system
      - Visible effect: new requests were kept by the system and becoming ghosts not traceable in the IS
    - Several conditions could be triggering the problem but the final reason was unclear
    - The condition could not be identified by the user
    - Only by the WMS manager monitoring tools
  - Solution at that time
    - Increase the number of ALICE dedicated WMS to Distribute the load through many WMS



The CREAM-CE

- CREAM (Computing Resource Execution And Management) ➔lightweight service for job management operations at the CE level
- Planned (since years) as replacement of the LCG-CE
- Submission procedures allowed by CREAM:
  - Via WMS
  - Direct
- The submission method depends basically on the experiment computing model
  - Usually a direct submission mode is used for pilot jobs (ALICE uses this)
- WLCG mandate: ALL sites should provide a CREAM-CE setup in parallel to the LCG-CE (WLCG/GDB: Nov 2008)

ALICE and the CREAM-CE

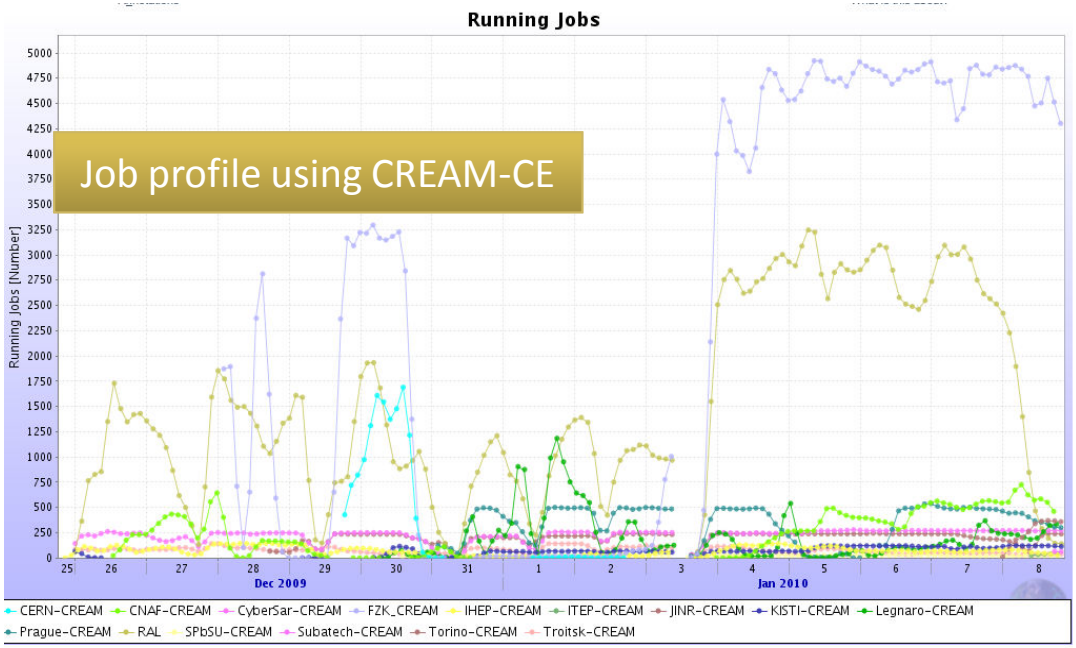
- ALICE requires deployment of the CREAM-CE service at all sites which provide support to the experiment
  - **GOAL: Deprecation of the WMS use in benefit of the direct CREAM-CE submission**
- Highest priority service deployment for the experiment in 2010
- First large-scale tests in the summer of 2008
  - CREAM setup deployed at FZK
  - Tests operated through a second VO-box parallel to the already existing service at the T1 (operating in WMS submission mode)
  - Intensive functionality and stability tests from July to September 2008
  - More than 55000 jobs successfully executed through the CREAM-CE
- ALICE has been the 1st LHC experiment putting the CREAM-CE in production and has became an important feedback source for the developers and the WLCG GDB

ALICE experience with the CREAM-CE

- Since 19/02/09 ALICE has implemented the CREAM-CE submission as part of the standard AliEn distribution
  - The system is a production service for the experiment
  - All sites providing this service have had to provide a 2nd VO-box
    - Necessary to fulfil the double approach (deployment of CREAM-CE in parallel to the LCG-CE) mandated by the WLCG
  - During 2009 all regional federations have deployed this service
  - ALICE has provided the CREAM-CE developers with regular feedback enabling important improvements in the system

ALICE experience with the CREAM-CE (II)

- Current status
  - CREAM-CE version (CREAM1.5 SL5/64b) has been tested by ALICE in December/January 2009
    - Feedback provided by the site administrators has enabled the identification of important service issues
    - All site administrators reported a remarkable stability of the system, essentially a lights-out operation



43% of the December/January jobs suubmitted through CREAM-CEs

2009 Operations

- ALICE priorities for 2009:
  - **Deployment of SL5** onWNs and VO-boxes (T0,T1,T2 sites)
    - DEADLINE: Mid-September 2009 → Self-imposed and following the recommendation of the MB in terms of pushing T1/T2 to migrate to SL5
      - SL5 WNs: available in March 2009
      - SL5 VOBOX: available in October 2009
    - STATUS: ACHIEVED, only 2 T2 have been excluded from production, pending OS update
  - **Deployment of a CREAM-CE** at all sites (T0,T1,T2 sites)
    - DEADLINE: Mid-November 2009 → following the milestones defined for CREAM-CE deployment
    - STATUS: Not fully achieved, this has became highest priority for 2010
      - HOWEVER: ALICE set the highest priority in the SL5 migration at the end of 2009
      - Sites were encouraged to concentrate on SL5 migration rather than on CREAM-CE setup

ALICE requirements for 2009/2010

- Requirements shown at the last Services and Operations meeting (December 2009)

Service	Version	Comment
CREAM-CE	1.6 1.7 1.8	Maximum Priority Bug fixes Initial integration of LB in CREAM
gLite-WMS (*)	3.3	Some improvements included
VOMS	2.0	Too few details given
LB	2.1.0 2.2.0	It includes native support for CREAM jobs, important for direct job submission Too few details given

Future plans

- March 2010: Deployment of a new AliEn version (v2.18) at all sites
- WLCG services
  - No changes expected in 2010 for the generic gLite VO-box
    - Setup of the 2nd VO-box (wherever present) as a backup solution
  - AliEn v2.18 will still support the submission to gLite-WMS
  - Follow up of the new versions of CREAM-CE together with the developers
- Similar approach to the SL5 migration to achieve full CREAM-CE deployment at all sites
- Implementation and testing of the glexec infrastructure in AliEn
  - Ready in about 2 months
- **LHC startup in March 2010**