A distributed computing design proposal for TDR

Armando Fella on behalf of Italian distributed computing group

Status of D. C. design definition

Meetings and contacts

- EGEE service group: discussion about EGEE projects scenario
- EGEE middle-ware experts: WMS in SuperB CM design
- LHC experiments: CM design, tools and service used
- FNAL experts for Grids interoperability info:
  - Burt Holzman, OSG/EGEE interoperability group
  - https://twiki.grid.iu.edu/bin/view/Interoperability/WebHome
  - SLAC offering to be the reference site for OSG setup issues and EGEE systems interoperability.
- First Distributed Computing Meeting with site contacts

Simulation Production

test software layer, submission via batch system at CNAF

- Full Simulation on July 2009
- Fast Simulation on September 2009

Bookkeeping DB design validation

- Ready to be tested

Distributed Computing human network

Updated info by D.C. Meeting (11th Sept)

- Foreseen availability of resources for SuperB in 2010, on average (some are just estimates with no official endorsement yet):

CNAF: 200 cores, 50 to 100 TB	Italian group
Caltech: ~ 250 cores, 20 TB	Frank Porter
SLAC: 200 cores, a few tens of TB	Steffen Luiz, Wei Yang
McGill: 60 cores, ?? TB; more in six months	Steven Robertson
Queen Mary: 100 cores, 20 TB	Adrian Bevan
RAL: 200 cores (up to 1000), 10 TB ?	Fergus Wilson
LAL and Lyon	Nicolas Arnaud

Do you have updates?

D. C. Proposal I, philosophy

- **Keep it simple**
  - Use mature services
  - Move on consolidate experience strategy
  - Exploit distributed resources, use one instance centralized service
- **Keep it cheap**
  - In terms of human resources: process automation, retry policy, service uniformity, web based tools
  - In terms of hw resources: network, CPU, disk space
- **As possible to be re usable**

D. C. Proposal II, service description

WMS - Work Load Manager:
- able to manage jobs across different Grid flavors: OSG, EGEE, ARCH
- job routing, bulk submission, retry policy, prologue-job-epilogue structure

LFC - LCG File Catalog:
- file name space manager, map Logical File Name in more replica PFN
- E.g.:/superb/2009_July/FastSim/DG_1/B0B0bar_generic/200/BtoKstarNuNu.root

LCG-Utils
- data handling LFC compliant, file transfer between SEs, replica manager

GANGA
- Job manager, multi platform (LSF,gLite,Condor,,), job monitor, easy to use
- Wiki: http://mailman.fe.infn.it/superbwiki/index.php/How_to_Grid/How_to_GANGA

SRM (StoRM at CNAF) – Storage Resource Manager V2
- LCG-Utils and LFC compliant, on top of heterogeneous storage systems

Job centric model, step by step

WMS permits to structure the job execution in a three steps procedure:

Prologue - script to be executed before the job start:
- Check the environment – retry policy instance
  - Software availability, services availability, r/w permission on SE, DB access...
- Read from SBK DB job info (http), configuration file creation (eg: MAC,..)
- Fast Sim case: copy the input files (Bkg, Geom) from ClosestSE to Job workspace

Job script – the container of simulation executable:
- Internal checks, Simulation execution
- FullSim case: the job input files (Bkg, Geometry) is transferred via input sandbox

Epilogue - script to be executed after the job completion:
- Check log/err file – retry policy instance
  - Success: Transfer the log, err, output.root to CNAF StoRM (via lcg-utils)
  - Fail: retry submission policy
- Update the SBK DB

D. C. Proposal II, workflow

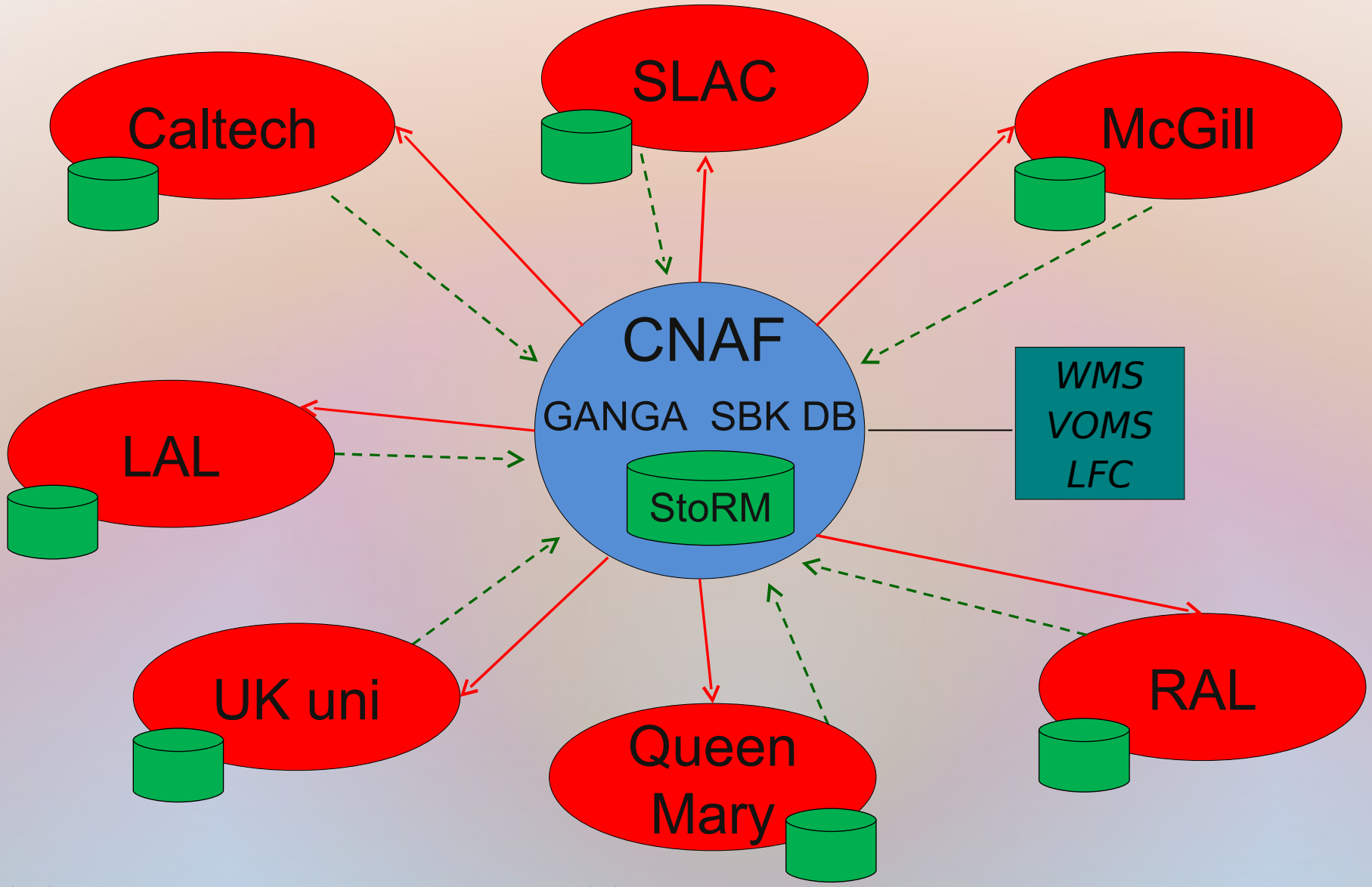
Data management:

- The input files for Fast Sim (Bkg and Geometry) replicated on all the sites
- The WMS accepts bulk submition within 4000 jobs a time
- LCG-utils transfer based has no limit in file size, sandbox limit = 100MB

1) **Production initialization via web interface:**
   - Fill a form with prod parameters (Prod Series, Geometry, Generator...)
   - Submit the form:
     - SBK DB data insertion (status = prepared)
     - Ad-hoc GANGA macro script creation

2) **Launch the GANGA submission via web or via GANGA interface**
   - Monitor I: use GANGA GUI interface to monitor the job status
   - Monitor II: use the web monitor SBK DB based + Data Handling mon

D. C. Proposal III, workflow



GANGA: job management frontend

http://mailman.fe.infn.it/superbwiki/index.php/How_to_Grid/How_to_GANGA

GANGA has been installed at CNAF accessible on ui01-lcg.cr.cnaf.infn.it
Features of interest:

- bulk submission
- job output merging
- job monitor via GUI interface, text
- multiple backends: LFC, Condor, gLite..

How to Grid/How to GANGA

Contents [hide]

1 Introduction
- 1.1 Backends

2 Installation overviw

3 Use GANGA at CNAF: prerequisites

4 Connect to the ui01-lcg

5 First time launching GANGA
- 5.1 Configuration

6 Using GANGA
- 6.1 GANGA CLI
  - 6.1.1 Examples of output
    - 6.1.1.1 LCG backend
    - 6.1.1.2 LSF backend
- 6.2 GANGA GUI
- 6.3 Repository

7 Reference material

SuperB Software installation procedure

http://mailman.fe.infn.it/superbwiki/index.php/How_to_Grid/Software_installation_in_Grid_model

The solution involves the use of yumdownloader tool (included by yum-utils pkg on SL5)
- Dependencies and conflicts management
- Download packages referring to custom configuration setup

- Environment setup: $VO_SUPERB_SW_DIR definition included
- Private RPMDB creation: rpm --initdb--dbpath $VO_SUPERB_SW_DIR/rpmdb
- Hosting system RPMDB acquisition: file transfer from official rpmdb path
- Yum.conf, yum.repo and superb.repo creation in $VO_SUPERB_SW_DIR
- GPG-KEY import and installation
- Packages download:
  - yumdownloader -c $VO_SUPERB_SW_DIR/yum.conf --resolve --destdir $VO_SUPERB_SW_DIR/download/ superb-sim
- Packages installation:
  - rpm -i --dbpath $VO_SUPERB_SW_DIR/rpmdb/ --relocate /etc=$VO_SUPERB_SW_DIR/etc/ --relocate /opt=$VO_SUPERB_SW_DIR/ $VO_SUPERB_SW_DIR/download/*.rpm

Remote sites requirements

Check the VO identity card at CIC operational portal
https://cic.gridops.org/index.php?section=vo

EGEE and OSG sites

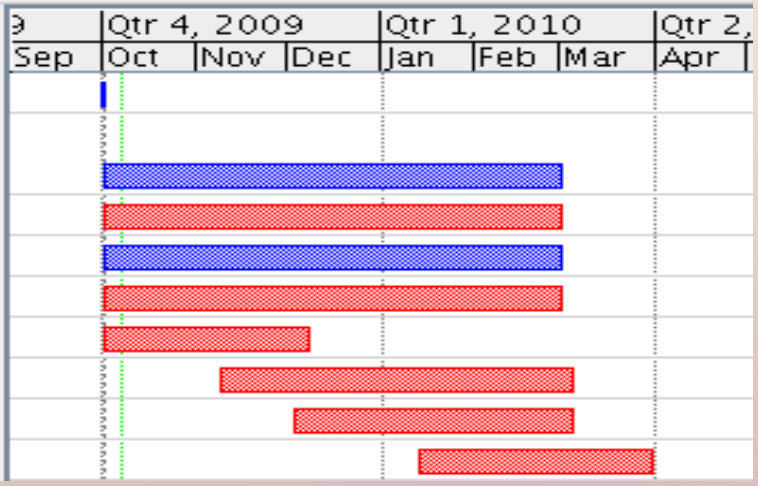
- SL5 Worker Nodes (on course or completed)
- Yum-utils package installed to permit SuperB sw Grid installation procedure. Reported into CIC
  - Wiki: http://mailman.fe.infn.it/superbwiki/index.php/How_to_Grid/Software_installation_in_Grid_model
- LCG-Utils availability on WN (standard)
- SRM V2 enabled (standard)
- GANGA installation

OSG interoperability (SLAC is the reference node)

- Verify the installation of EGEE condor plugin (standard)
- Make the superbvo.org VO inclusion/defined in OSG (not blocking)

To do list and time line proposal

		Name
1		Distributed Production for April 2010
2		Develop SBK job communication layer
3		Develop SBK monitoring layer
4		Develop Ganga submission script generator
5		Develop job prologue/execution/epilogue scripts
6		Configure remote sites
7		Test remote site configuration
8		Test file transfer to from CNAF
9		Distributed production test



Discussion, distributing the effort:

- We propose to distribute the activities at **items 3, 6, 7**
  - 3) Develop SBK monitor sw layer
  - 6) Remote sites configuration
  - 7) Remote sites validation

Any potential other item of interest needs share of effort

BACKUP Slides