LHCb planning on EU GRID activities (for discussion)

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Overview of presentation

- The HEP Applications workpackage(WP8) overview
- Reminder of our use case(s)
- Milestones
- Deliverables
- Resources

EU GRID proposal status (http://grid.web.cern.ch/grid/)

- EU Reaction to pre-proposal of 30 M Euro - come back with a proposal of 10 M Euro maximum!
- Scaled down proposal being worked on - to be submitted early May
  - Main signatories (CERN,France,Italy,UK,Netherlands,ESA) + associate signatories (Spain,Czechoslovakia,Hungary,Spain,Portugal,Scandinavia..)
  - Project composed of Work Packages (to which countries provide effort)
- LHCb involvement
  - Depends on country
  - Essentially comes via 'Testbeds' and 'HEP applications'

EU Grid Work Packages

- Middleware
  - Grid work scheduling — C Vistoli(INFN)
  - Grid Data Management — B Segal(IT)
  - Grid Application Monitoring — R Middleton(RAL)
  - Fabric Management — T Smith(IT)
  - Mass Storage Management — O Barring(IT)
- Infrastructure
  - Testbed and Demonstrators — F Etienne(Marseille)
  - Network Services — C Michau(CNRS)
- Applications
  - HEP (LHCb involved) — H Hoffmann(CERN)
  - Earth Observation — L Fusco(ESA)
  - Biology — C Michau(CNRS)
- Management
  - Project Management — F Gagliardi(IT)

Objective of HEP applications workpackage

- Exploit the developments of the project to offer transparent access to distributed data and high performance computing facilities to the geographically distributed physics community

GRID LHCb WP Physics Study(DRAFT)

- The total sample of B > JΨ/K_s simulated events needed is ~10 times the number produced in the real data.
- In one year of datataking we expect to collect and fully reconstruct 10^5 events, therefore need 10^6simulated events.
- The number of events that have to be generated, stored and reconstructed to produce this sample is 10^7.
- 10% of the ESD data copied for systematic studies (~100 GB).
- The total amount of data generated in this production would be :

RAW data	200 kB/event	x 10^7	= 2 .0 TB
Generator data	12 kB/event	x 10^7	= 0.12 TB
ESD data	100 kB/event	x 10^7	= 1 .0 TB
AOD data	20 kB/event	x 10^7	= 0. 2 TB
TAG data	1 kB/event	x 10^7	= 0.01 TB

Grid LHCb WP - Grid Testbed (DRAFT)

- MAP farm at Liverpool has 300 processors would take 4 months to generate the full sample of events

- All data generated (~3TB) would be transferred to RAL for archive (UK regional facility).

- All AOD and TAG datasets dispatched from RAL to other regional centres, such as Lyon and CERN.

- Physicists run jobs at the regional centre or ship AOD and TAG data to local institute and run jobs there. Also copy ESD for a fraction (~10%) of events for systematic studies (~100 GB).

- The resulting data volumes to be shipped between facilities over 4 months would be as follows :

Liverpool to RAL	3 TB	(RAW ESD AOD and TAG)
RAL to LYON/CERN/…	0.3 TB	(AOD and TAG)
LYON to LHCb institute	0.3 TB	(AOD and TAG)
RAL to LHCb institute	100 GB	(ESD for systematic studies)

Milestones

- Mx1 (PM6) Coordination with the other WP's. Identification of use cases and minimal grid services required at every step of the project. Planning of the exploitation of the GRID steps.
- Mx2 (PM12) Development of use cases programs. Interface with existing GRID services as planned in Mx1.
- Mx3 (PM18) Run #0 executed (distributed MonteCarlo production and reconstruction) and feed back provided to the other WP's.
- Mx4 (PM24) Run #1 executed (distributed analysis) and corresponding feed-back to the other WP's. WP workshop.
- Mx5 (PM30) Run #2 executed including additional GRID functionality.
- Mx6 (PM36) Run #3 extended to a larger user community

Deliverables

- Dx1 Planning document with specifications of the GRID services required from the other working groups for the different phases of the WP.
- Dx2 Use cases programs. Report on the interfacing activity.
- Dx3 Report on the results of Run #0 and requirements for the other WP's.
- Dx4 Report on the results of Run #1 and requirements for the other WP's. Workshop proceedings.
- Dx5 Report on the results of Run #2 and requirements for the other WP's.
- Dx6 Report on the results of Run #3. Final project report

Resources (Man-months over 3 years)
FOR DISCUSSION!

COUNTRY / TASK	UK	France	CERN	Italy	NL
Alice	36	36+36F	36	72	?
Atlas	36	36+36F	36Sweden	36+36F	?
CMS	36		36+36F	108	?
LHCb	36+36F	36	36	36	?
TOTAL	180	180	180	288	?