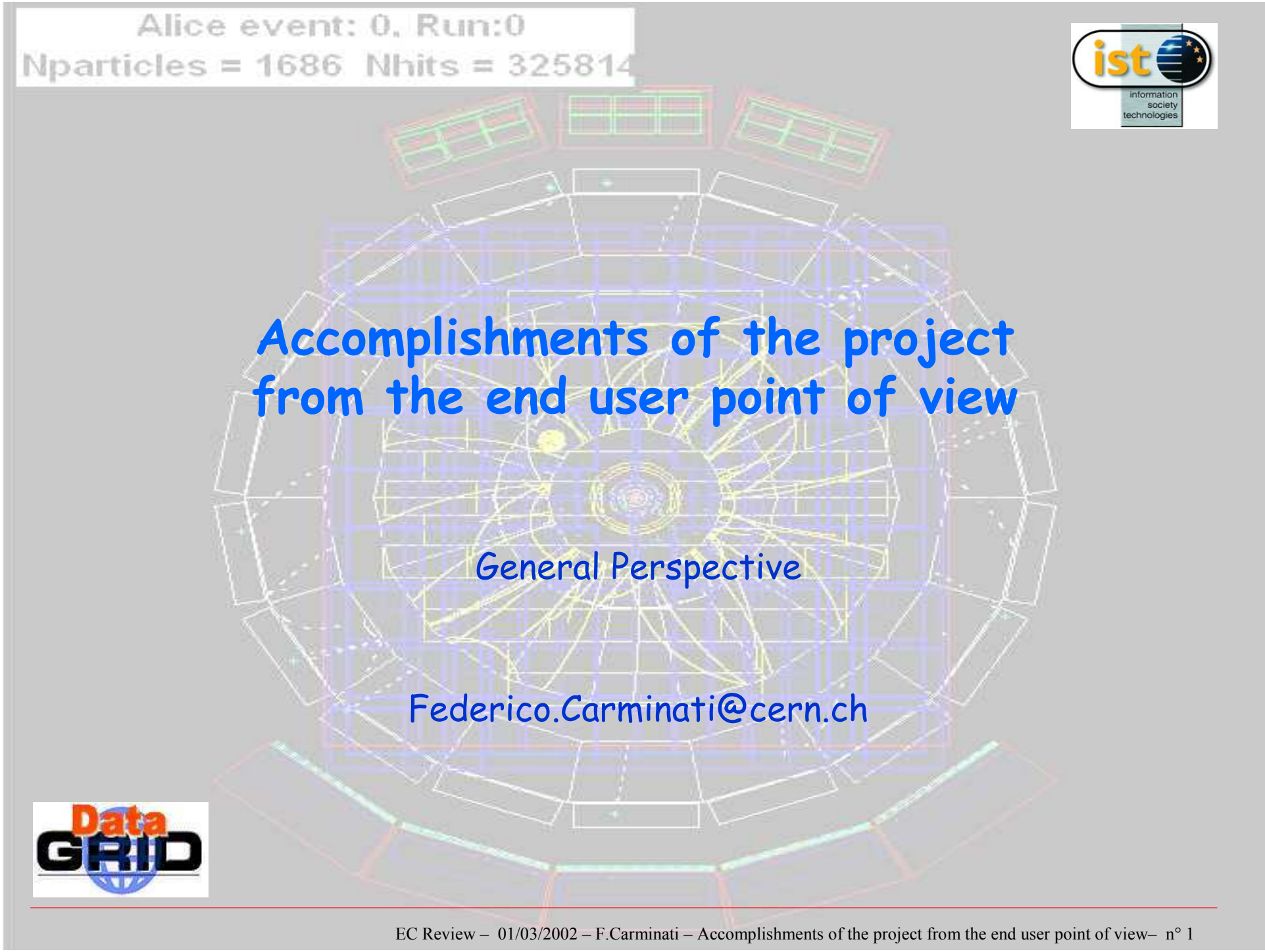


Accomplishments of the project from the end user point of view

General Perspective

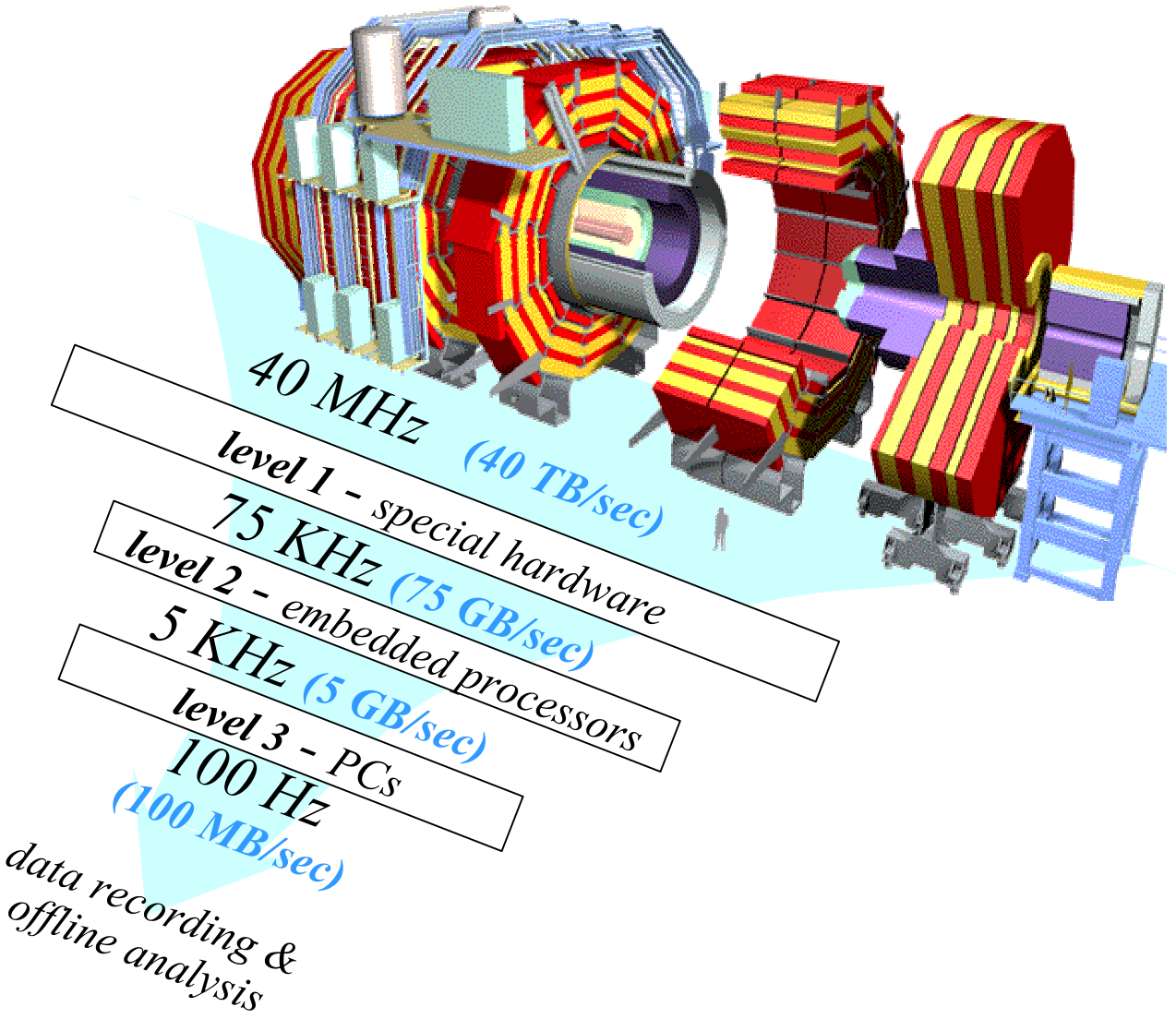
Federico.Carminati@cern.ch

Application objectives for year 1

- Define use cases for the applications
- Define application requirements
- Deploy realistic applications on the TestBed 1
- Evaluate TestBed 1

online system

multi-level trigger
filter out background
reduce data volume

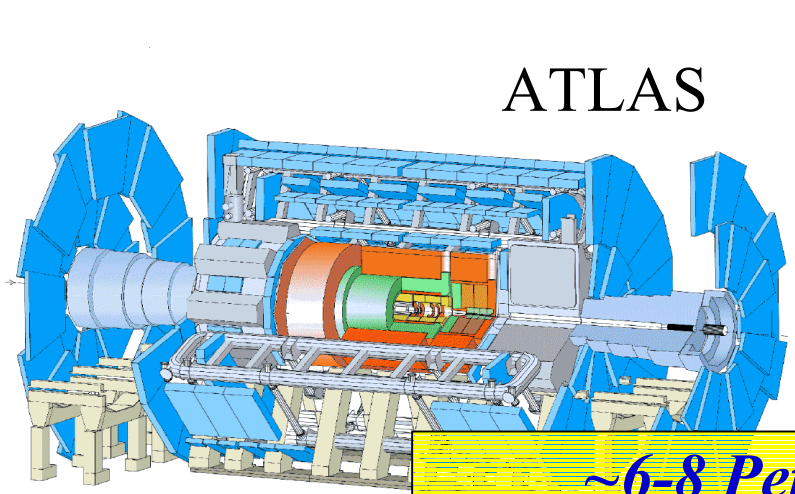


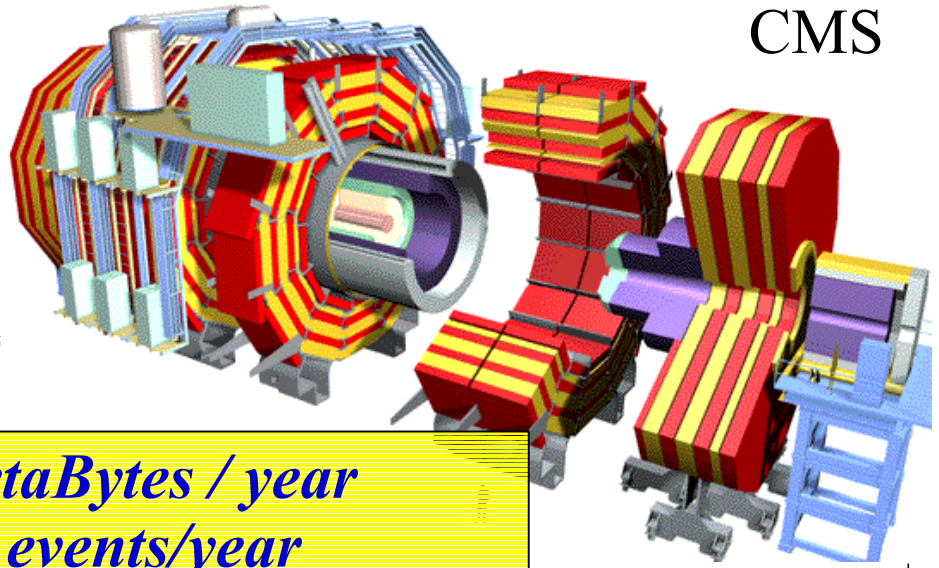
les.robertson@cern.ch

The LHC Detectors

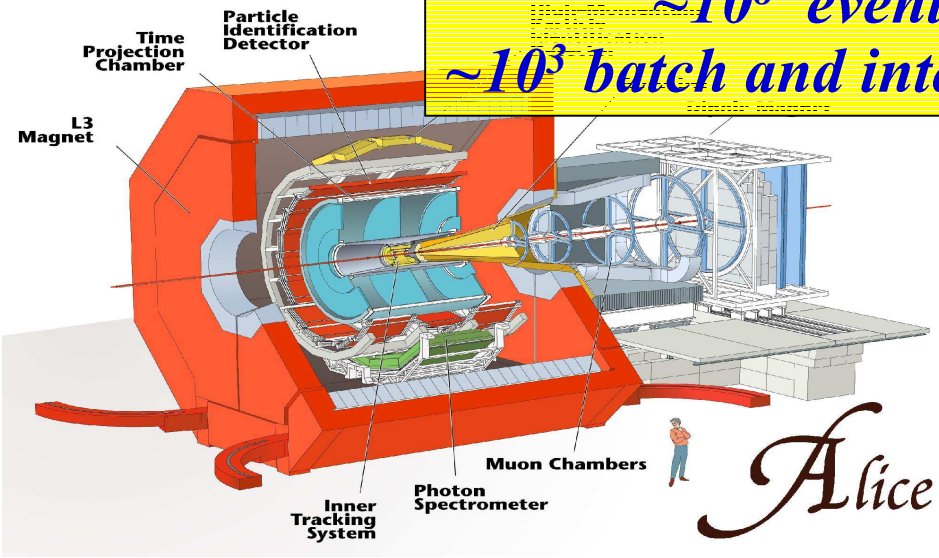
ATLAS

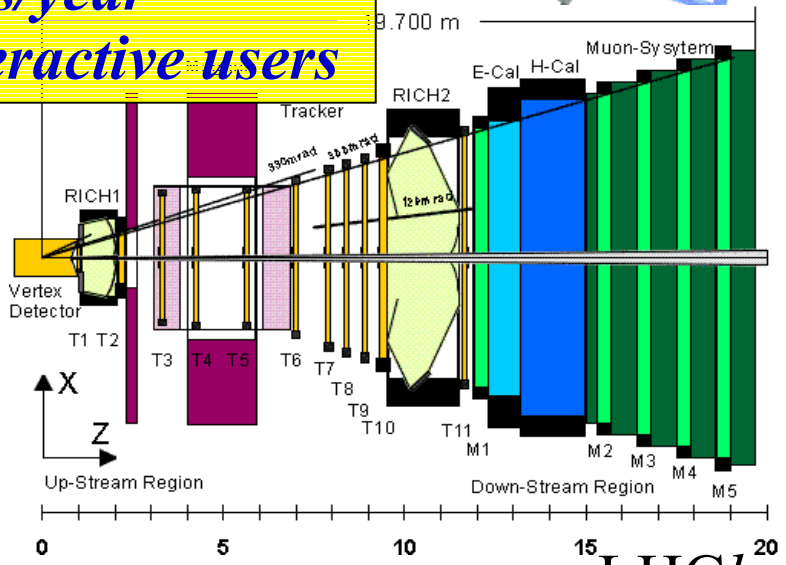
CMS





~6-8 PetaBytes / year
~10^8 events/year
~10^3 batch and interactive users



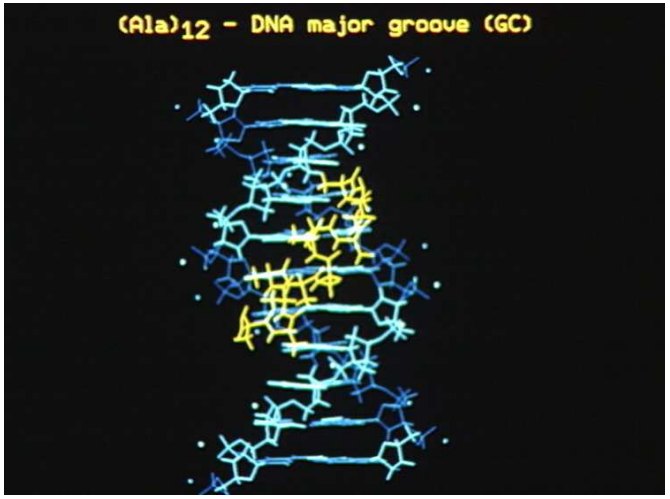


CERN's Network in the World

Europe: 267 institutes, 4603 users
Elsewhere: 208 institutes, 1632 users

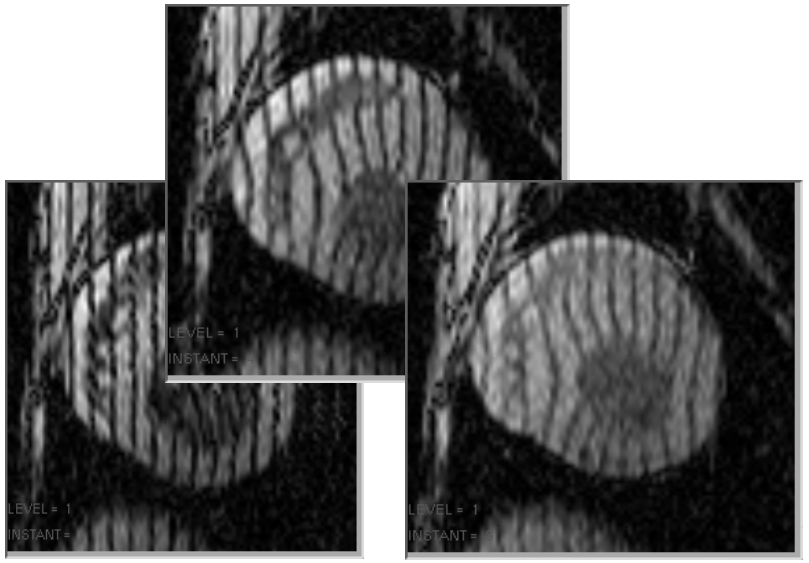
Biomedical Applications

Genomics, post-genomics, and proteomics



Explore strategies that facilitate the sharing of genomic databases and test grid-aware algorithms for comparative genomics

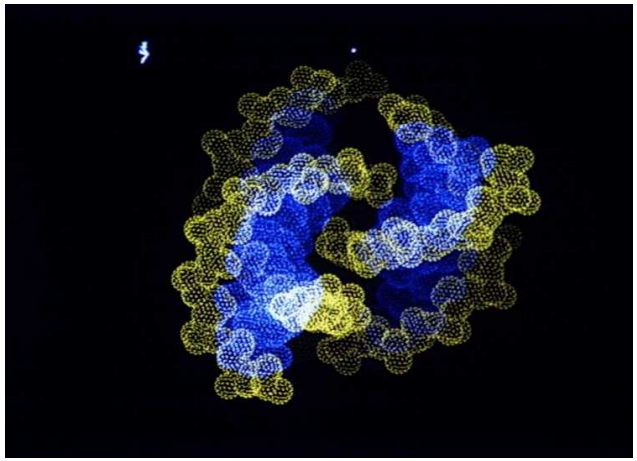
Medical images analysis

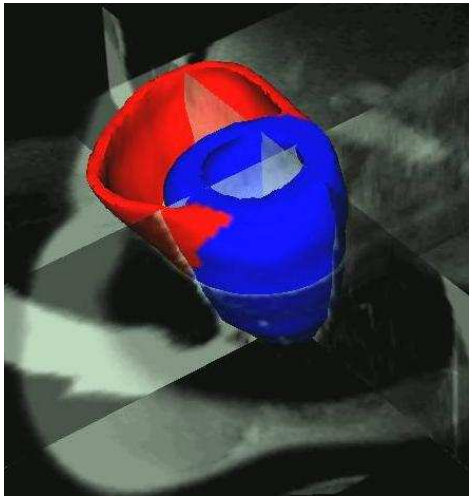


Process the huge amount of data produced by digital imagers in hospitals.

Grid added value for biomedical applications

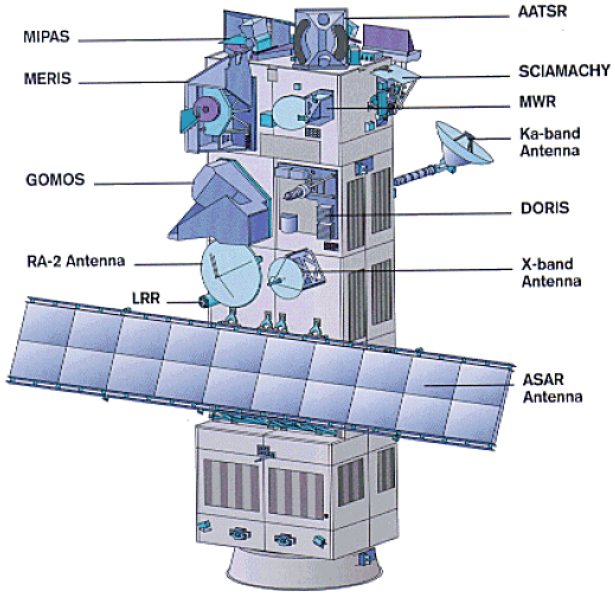
- Data mining on genomics databases (exponential growth).
- Indexation of medical databases (Tb/hospital/year).
- Collaborative framework for large scale experiments (e.g. epidemiological studies).
- Parallel processing for
  - Databases analysis
  - Complex 3D modelling





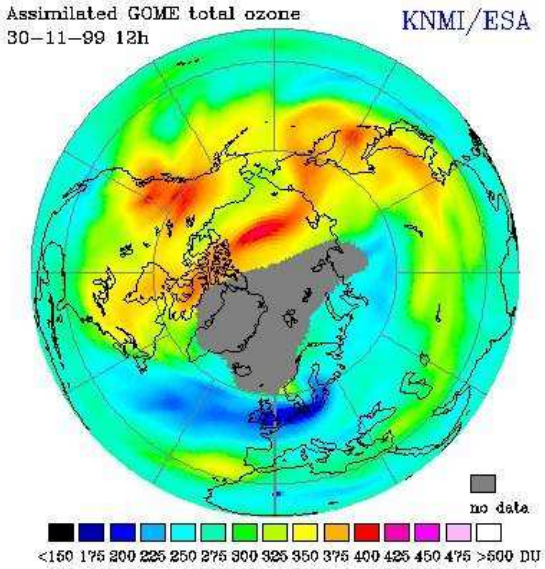

ENVISAT
• 3500 MEuro programme cost
• 10 instruments on board
• 200 Mbps data rate to ground
• 400 Tbytes data archived/year
• ~100 "standard" products
• 10+ dedicated facilities in Europe
• ~700 approved science user projects

Earth Observations



ESA missions:

- about 100 Gbytes of data per day (ERS 1/2)
- 500 Gbytes, for the next ENVISAT mission (2002).



DataGrid contribute to EO:

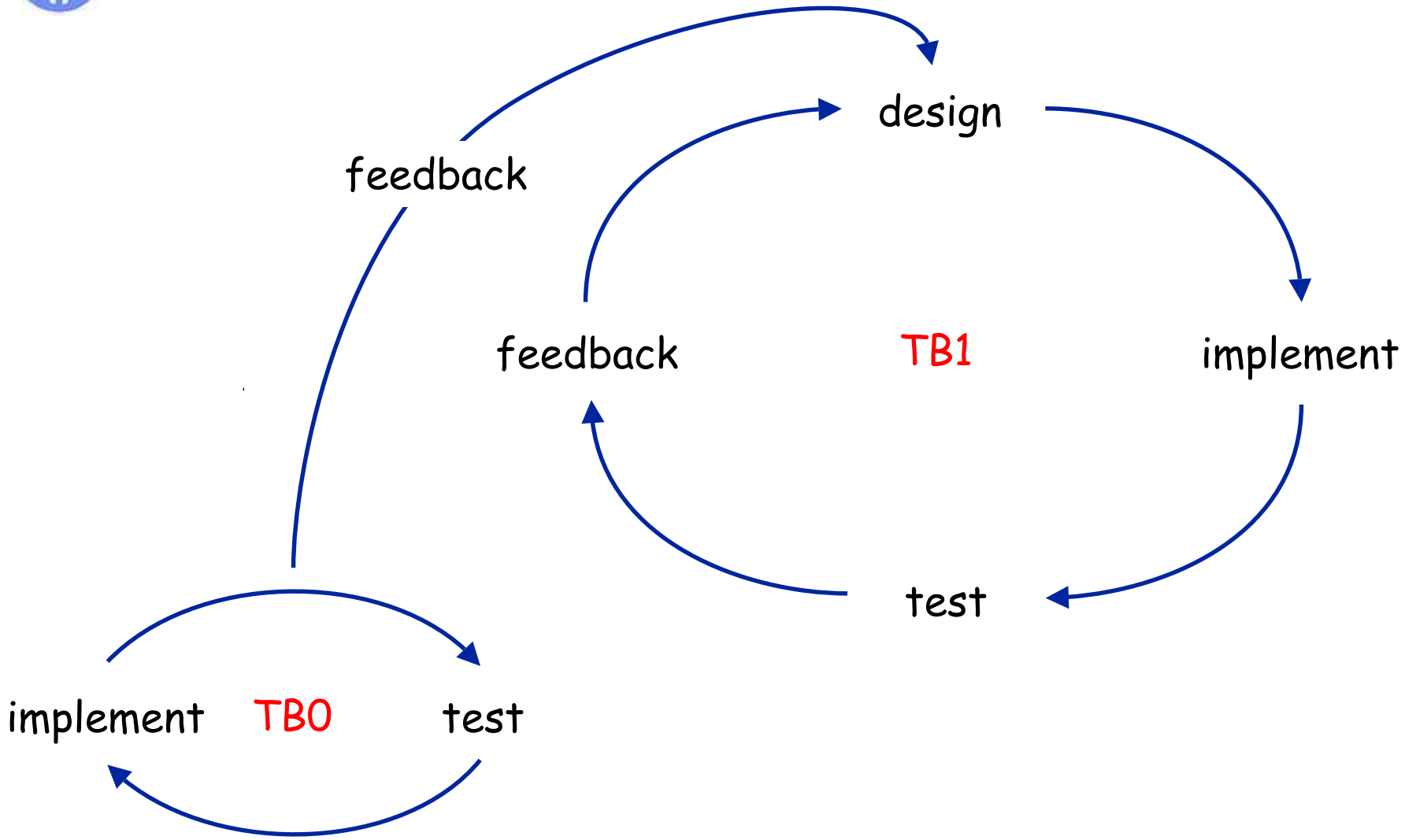
- enhance the ability to access high level products
- allow reprocessing of large historical archives
- improve Earth science complex applications (data fusion, data mining, modelling ...)

Source: L. Fusco, June 2001

Achievements

- A wide-ranging reflection has been launched within the applications on the opportunities opened by the GRID technology
  - Each HEP experiment is a world-wide distributed community of some 1000-2000 researchers
  - Dialogue and coordination at several levels has been necessary to reach a common understanding
  - Understand how to do things differently and not *more of the same*
- To improve their understanding of the issue, applications have asked to have a GLOBUS only TestBed deployed immediately
  - Applications produced a set of requirements for TestBed 0 in 1Q 2001
  - Testbed 0 has been in operation since 2Q 2001
  - A very large amount of unfunded effort, particularly from WP8, has made this possible

Achievements

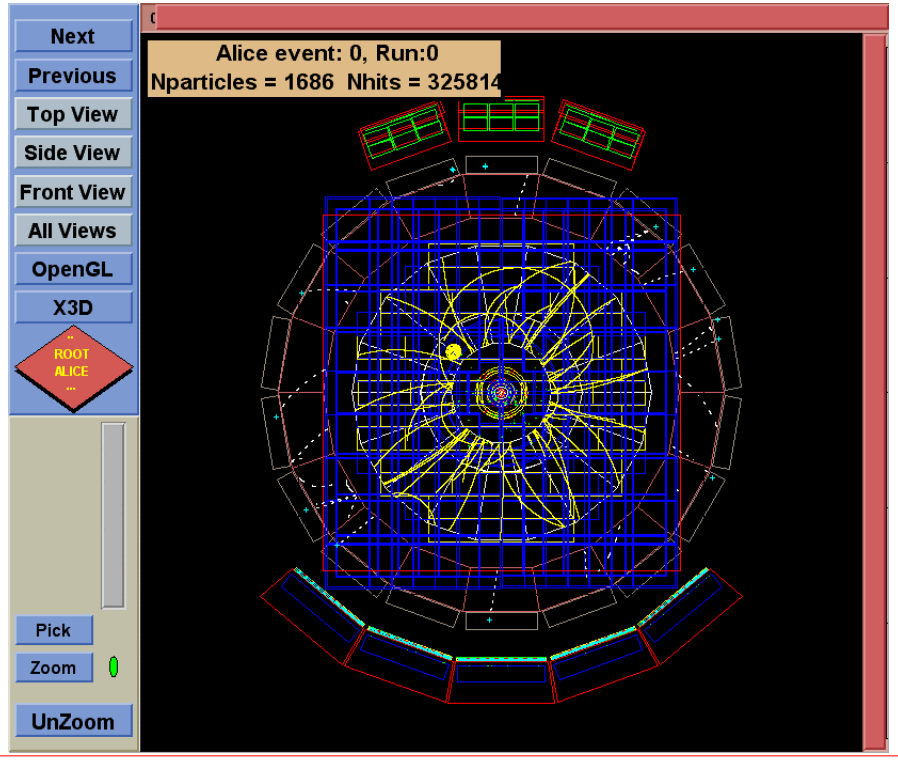


Achievements

- Realistic applications using GLOBUS authentication have been deployed on TestBed 0
- Applications have expressed their requirements in June 2001
  - For this it has been necessary to develop detailed "long term use cases"
  - A very large exercise leveraging essentially unfunded effort (possibly some 30-40 person/month)
  - This has left few months to the developers to produce the middleware
- Funded WP8 effort has participated to the deployment and configuration of the TestBed
- Funded WP8 effort has performed a thorough validation of the TestBed with "generic" HEP applications developed by them for this purpose
  - Resource Broker
  - Replica catalogue functionality

Achievements

- Detailed TestBed evaluation plans have been elaborated and applied
  - Few hours after the official opening of the TestBed on December 9 a standard physics simulation job has been run
  - Although TB1 had not reached stability much middleware functionality was demonstrated by the applications in a short period of time



Achievements

- Mechanisms to provide feedback to the developers have been put in place
  - Priority list constantly updated by WP8 and discussed at weekly WP manager meetings
  - Feedback on the release plan
  - Detailed user requirements for crucial components (e.g. Storage Element) in preparation

Issues and actions

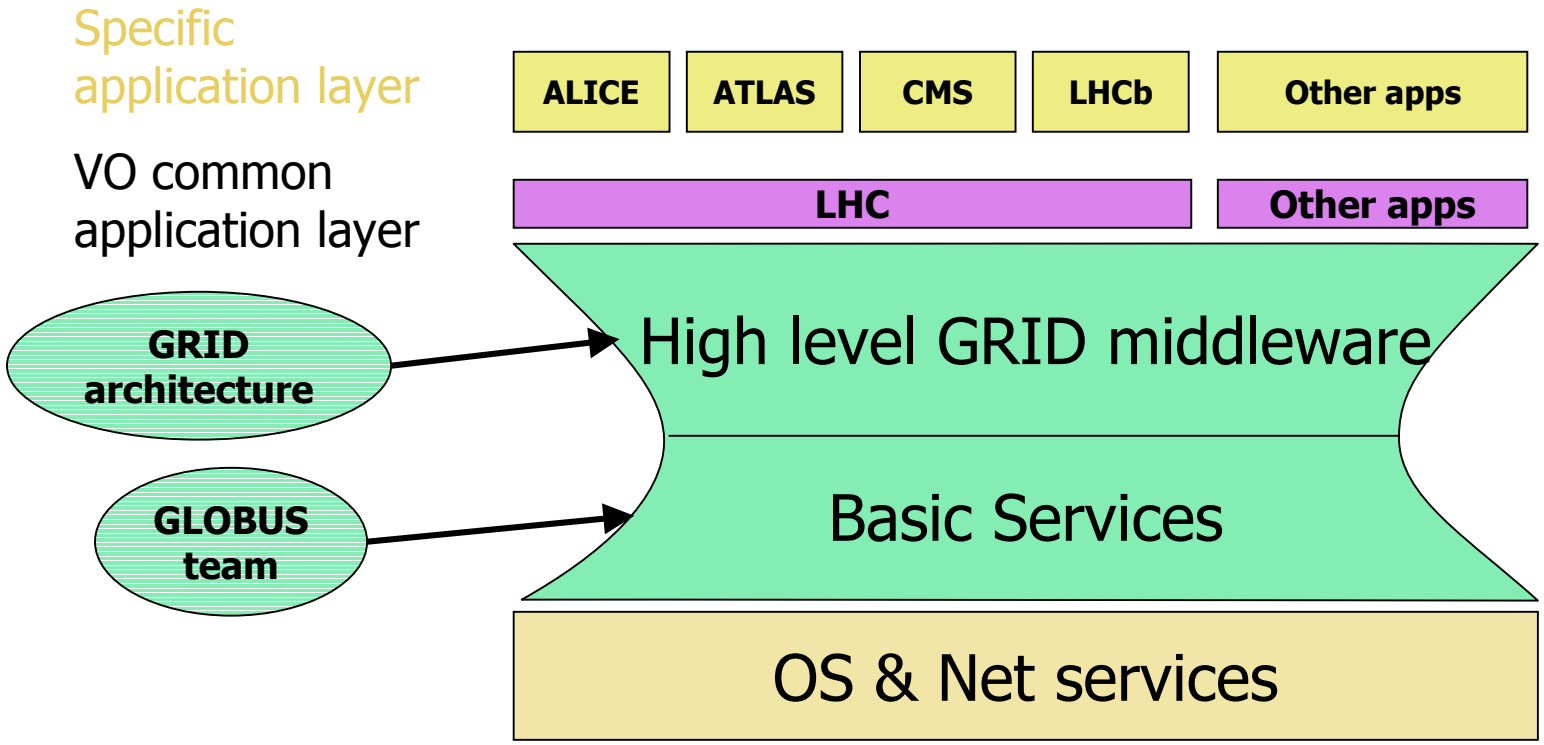
- Configuration and management of the VO's on the TestBed has been unexpectedly difficult
  - The responsibility is shared, some of our needs were not expressed too clearly and were not given enough attention
  - Procedures should be worked out to automatise it
- Assignment and escalation of problems is complicated
  - It has worked well thanks to the heroic efforts of all people involved, but it will have to be better formalised
  - Need tight coordination between site-managers, TestBed and applications
- Coexistence of pseudo-production and development environment is a problem
  - We have done it for years on a local environments
  - On a distributed ones is more difficult and we are learning
- Deployment plans to all TestBed sites are still unclear
  - This will be clarified in the next minor releases

Plan for the next year

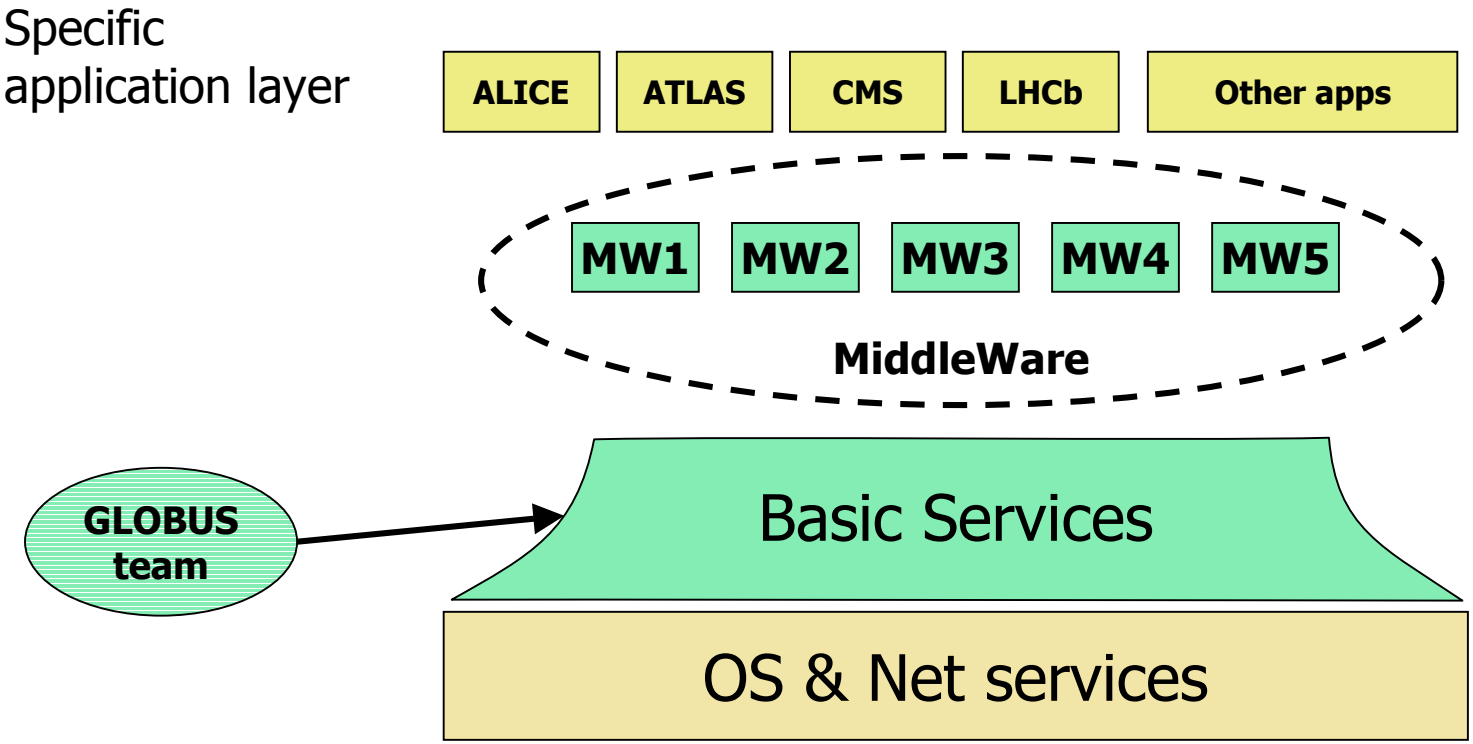
- Continue exploitation of TB1
  - Provide continuous feedback to developers
  - Deploy larger and more realistic applications on TB1
  - Use the TB1 for "data challenges" and "production challenges"
  - Use more sites as TB1 expands
- Refine the user requirements and long term views
  - We should be able to express them in a more uniform way
  - A common set of requirements / use cases to define common solutions
  - This will also facilitate the relation with other GRID MW projects
    - Collaboration with DataTag WP4 has MW interoperability as specific goal
  - A Requirement Technical Assessment Group (RTAG) has been launched in the context of the LHC GRID Computing Project with this mandate
  - This has been possible because of the work of the DataGRID project and is heavily based on WP8's findings to date

What we want from a GRID

- This is the result of our experience on TB0 & TB1



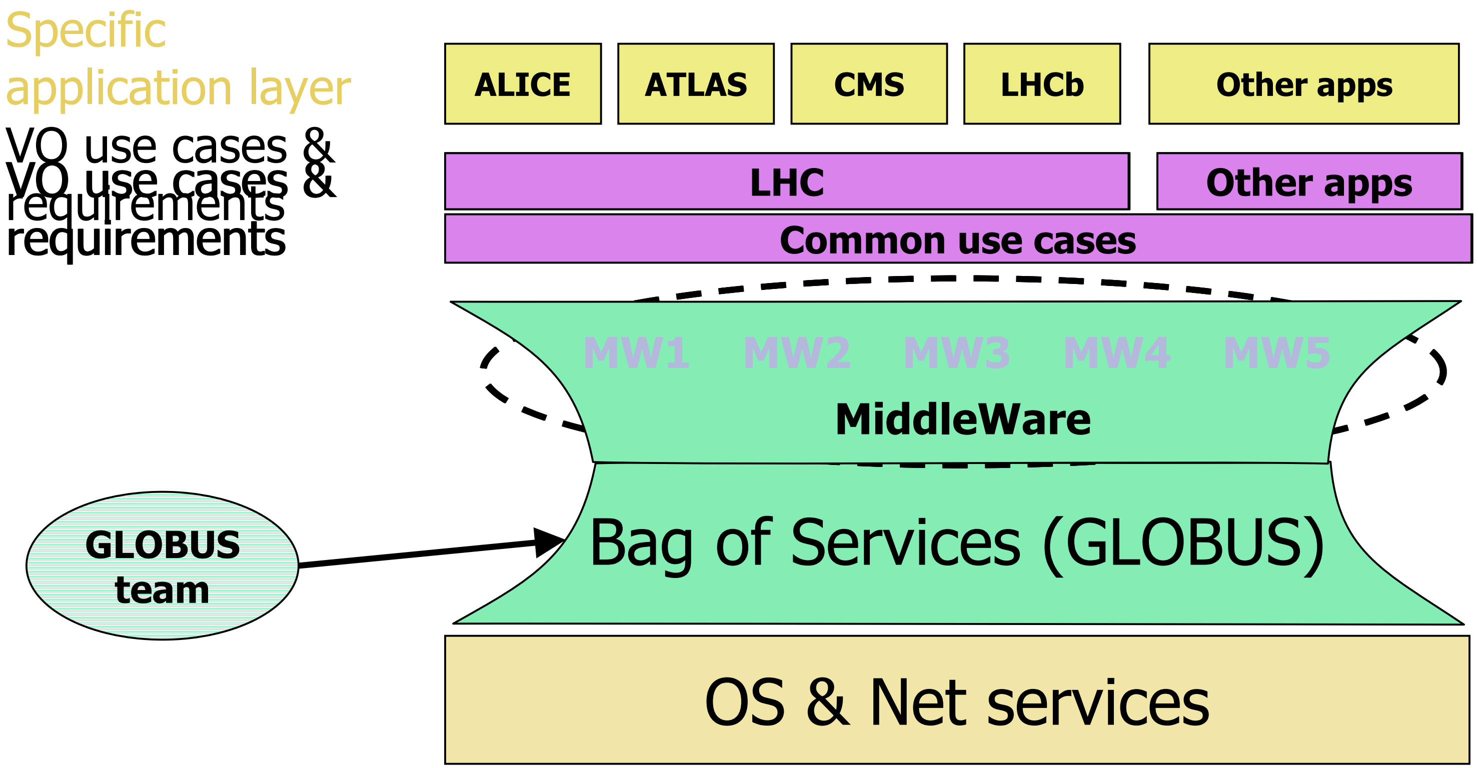
What we have


Specific
application layer
ALICE
ATLAS
CMS
LHCb
Other apps
MW1
MW2
MW3
MW4
MW5
MiddleWare
GLOBUS
team
Basic Services
OS & Net services

A proposal

If we manage to define

Or will be better to arrive at



RTAG for common GRID use cases & requirements

- Chair: F.Carminati
- Mandate: define a common set of use cases and requirements for GRID applications among the LHC experiments
  - Review the current plans of integration of GRID services in the software frameworks of the experiments
  - Identify and describe a set of high level use cases of GRID technology common to the four experiments
  - Identify and describe which use cases will be specific for the different experiments
  - Derive a set of common requirements for GRID MW
- Timescale - Initial report in 1 month, final report within 2 months
- Makeup - Reps from experiments, EDG, iVDGL + additional members at chair's discretion
- Guidance – The result of the RTAG should be the detailed description of use cases implementable by the framework of the four experiments using present or planned GRID middleware. These should serve to the MW developers (both in US and in Europe) to guide their work and to the experiments as platform to perform GRID interoperability studies

Summary

- Applications have been able to deploy and demonstrate large applications on the TestBed
  - The LHC experiments are participating with enthusiasm to the project
- The side effect is that the pressure is high from the users for
  - Support
  - Stable environment
  - Functionality
  - Documentation
  - Wide deployment
- These are healthy signs
  - However positive reaction to the feedback from the users is now necessary in order to maintain their high level of enthusiasm and participation
- The evolution of TB1 leading to TB2 will be a crucial test of the project's ability to reach its final goals