

NW-GRID Future Developments

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Grid Applications



- We expect a growing number of “hosted” applications
- academic and open source is not a problem
- commercial licensed software may be more difficult – we are discussing with vendors on a case-by-case basis
- Tell us what applications you need
- Can you provide any?

Testbed Objectives



- The project is structured around three major testbed milestones:
 - Testbed 1 (2006): High-performance and parametric applications – we have been doing this as already presented
 - Testbed 2 (2007): Safe, bookable and accountable Grid
 - Testbed 3 (2008): Collaborative real-time Grid
- For both academic and commercial users

To respond to the requirements of these testbeds and applications we will be developing or evaluating new middleware components

- T1: we have demonstrated RMCS and GROWL during this course and are evaluating AHE
- T2: we will be deploying a portal, similar to the NGS portal. We are also evaluating user and VO management, resource allocation and co-scheduling software, e.g. GOLD and HARC
- T3: we are looking for software for a collaborative real-time Grid, which will include visualisation, steering and job migration

We will move forward with the latest middleware technology to remain compatible with NGS and Grid worldwide

Hardware



- Some additions to the Grid infrastructure from partners have already been mentioned
- We have a refresh phase coming up and are gathering requirements
- NW-GRID will no longer be a homogeneous system, but will consist of the 4 core clusters plus special-purpose facilities accessible to all users

A Unique North-West Project: advancing Grid Technologies and Applications



Technology "tuned to the needs of practicing scientists".

Hooks to other Grid consortia: NGS, WRG

Top end: HPCx and CSAR

Applications and industry

Pharma, meds, bio, social, env, CCPs

Portals, client toolkits, active overlays

Mid range: NW-GRID and local clusters

User interfaces

Sensor networks and experimental facilities



Advanced Network technology

Desktop pools: Condor etc.



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Range of Resource Types



- National Class Supercomputers (CSAR and HPCx)
- Advanced architecture development systems (BlueGene-L)
- Commodity Clusters (NW-GRID core, POL, etc.)
- Mid range systems (SGIs, e.g. for visualisation)
- Campus Grid pools (Condor - DL internal, Liverpool)
- Desktop client systems – Windows, Linux, Mac
- Philanthropic computing (e.g. seti@home)
- Mobile devices – Nokia770, PDAs
- Sensor Grid networks – Lancaster

This brings interesting challenges!



Some Challenges



- New scalable algorithms
 - should include steering and checkpointing capabilities
 - make use of intergrid networks with high latencies (like our fibre network)
 - scale to 1000s of processors – BlueGene may be upgraded to 4000...
- Resource brokering and matching requirements to appropriate platforms
 - efficient use of resources
 - scheduling requirements – high priority, backfill, etc.
- Lightweight Grid computing
 - improve client access, static and mobile
- Dynamic Grid configurations and VOs
- Inter-working Grids, e.g. GridPP, CampusGrid

Possible e-Environment Grid Services Architecture

