

Information and Monitoring

WP3



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Outline

- ◆ Objectives of WP3
- ◆ Achievements
- ◆ Lessons Learned
- ◆ Future Work
- ◆ Exploitation Plans

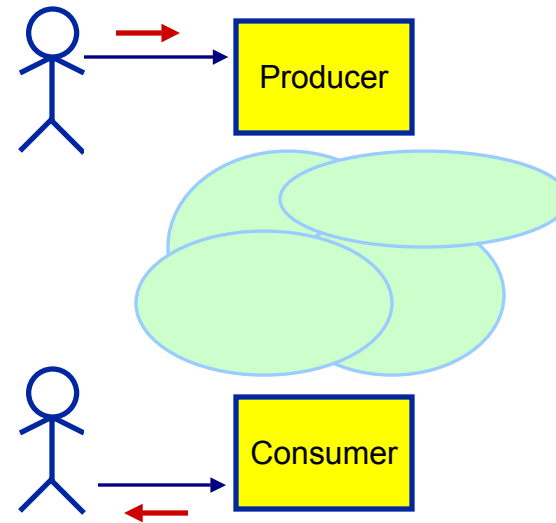
Objectives of WP3 (TA)



- ◆ To provide a system or systems able to meet all the information and monitoring needs within a Grid from resource discovery to application monitoring

Objectives (D3.2) – part 1

- ◆ Base on the Grid Monitoring Architecture (GMA) from the GGF
 - Very simple model
- ◆ For Relational Grid Monitoring Architecture (R-GMA): hide Registry mechanism from the user
 - Producer registers on behalf of user
 - Mediator (in Consumer) transparently selects the correct Producer(s) to answer a query
- ◆ Users just think in terms of Producers and Consumers
- ◆ Use relational model (R of R-GMA)
 - Facilitate expression of queries over all the published information



Objectives (D3.2) – part 2

- ◆ Following the GMA, the system should offer one-off and streaming queries
- ◆ Ensure that all records carry a timestamp - then all information can be used for monitoring
- ◆ Highly scalable
- ◆ No single point of failure
- ◆ Dynamic schema mechanism to make it easy for applications to publish information
- ◆ Fine grained authorisation mechanism
- ◆ Ability to deal with very high rates of data to monitor the performance of parallel jobs
- ◆ Interoperation with other information systems – e.g. MDS

Achievements



- ◆ Since December the R-GMA code has become very much more stable – as recorded in D3.6
- ◆ We achieved what we set out to do by the end of the project
- ◆ Unfortunately much of the experience of the Application Work Packages has been with the earlier versions

Achievements



- ◆ We have successfully challenged the conventional wisdom on information and monitoring services on the Grid and produced a system that the user community is keen to use
- ◆ The main product is R-GMA, which does treat the whole area of information and monitoring as a single coordinated system
- ◆ Tools have been developed to allow R-GMA to interoperate with other systems:
 - ⑩ GIN/GOUT – for compatibility with MDS
 - ⑩ Nagios integration for displays and alerts
 - ⑩ Rangleria (ganglia integration) to allow R-GMA access to ganglia
- ◆ We have a new version of GRM, which is integrated with the GridLab Mercury monitor for performance monitoring of parallel applications. This combines the flexibility of R-GMA with the performance of the Mercury monitor

Users



- ◆ WP1,2,4 and 5 for MDS like use
- ◆ WP8: CMS for BOSS – for job monitoring
- ◆ WP8: D0 – similar job monitoring
- ◆ WP7 – Network monitoring
- ◆ LCG – Trying it for accounting information



BOSS with R-GMA



- ◆ Simulation MC jobs
 - Each job creates a stream producer publishing a number of tuples depending on the job phase
- ◆ An Archiver collects tuples
 - Archived tuples are checked
- ◆ Results
 - **Early 2003** fell over at around **10** jobs!
 - **October 2003** managed about **400**
 - Reported at IEEE NSS Conference, Oregon, USA, 21-24 October 2003
 - **Now 2** MC simulations, each running **4000** jobs

Application testbed – performance



URI	data age < 300 seconds (%)	response time < 10 seconds (%)	timeout queries (%)	Service Status OK (%)
<i>http://heplnx30.pp.rl.ac.uk/R-GMA/StreamProducerServletSummary</i>	97	-	2	-
<i>http://gw22.hep.ph.ic.ac.uk:8080/R-GMA/LatestProducerServlet</i>	98	100	0	100
<i>http://tbn08.nikhef.nl:8080/R-GMA/LatestProducerServlet</i>	98	100	0	100
<i>ldap://tbn08.nikhef.nl:2169/Mds-vo-name=local%2Co=grid</i>	-	97	0	99
<i>ldap://gw22.hep.ph.ic.ac.uk:2169/Mds-vo-name=local%2Co=grid</i>	-	98	0	100

Lessons learned

- ◆ Release working code early
- ◆ Distributed Software System testing is hard
 - We learned the tremendous value of a private WP3 testbed. While some problems only appear with real users, we were able to detect most problems on our own testbed
 - Have recently added code to stress R-GMA on the WP3 testbed. This shows up problems which previously only showed up on the application testbed
- ◆ Automate as much as possible
 - Have made use of an open source product, Cruisecontrol, to rebuild and test software whenever people check in
 - Most of the time, most people run most of the tests
 - Cruisecontrol *always* runs *all* of them

◆ Functionality

- Improve Virtual Organisation (VO) support so that each VO only sees its own information
- Need multiple physical registries for performance and for resilience
- Implement fine-grained authorisation
- The mediator should support a broader range of queries

◆ Packaging

- Web services will be the base grid technology for the next few years, so it is essential that all WP3 software be migrated to Web services
 - Prototypes already written
- The portability of the system will be improved
 - Need to make it easy to install “anywhere on any platform”

Exploitation – R-GMA in GGF



- ◆ The inclusion of GMA concepts in OGSA will be very beneficial to OGSA and to the widespread acceptance of R-GMA
- ◆ Have submitted documents to the OGSA working group of the GGF to explain how GMA fits into OGSA
 - We bring an implementation: R-GMA
 - Participated in phone meetings with the OGSA-WG discussing these documents
 - Attended Face-to-face meeting of the OGSA-WG in San Diego last week

Exploitation – R-GMA in EGEE



- ◆ R-GMA will be hardened within EGEE
 - To provide highly robust, production quality, web services
- ◆ University-based research groups should take the ideas forward
 - Seeking collaborations to make this happen
 - Once the direction is established, those working on EGEE can produce the necessary production quality code
- ◆ Continued involvement of the user community will bring new requirements – and a further improved product

Exploitation – R-GMA in the world



- ◆ To increase visibility and to provide a focus for our users a web site (<http://www.r-gma.org/>) has been constructed
- ◆ Once the system is repackaged to make it easy to build and configure on most platforms and with clear documentation we anticipate a good take-up

Summary

- ◆ We did what we said we would
- ◆ Users like R-GMA
 - An expanding community
- ◆ Now the challenge is to make it a big success worldwide