Monitoring for the D-Grid
Towards an Interoperable and VO-integrated Monitoring and Information Service

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Monitoring for the D-Grid

The Monitoring-Project
is part of the D-Grid Integration/Infrastructure Project (DGI)

Research focused on

- Requirements Analysis
- Evaluation of Monitoring Systems
- Integration
- Deployment
  - Information Providers
  - VO-based Views
- Customer Service Management for Grids
Requirements

Target
a system for customer service management and VO-based
Monitoring of Grid resources

Constraints
– Build a comprehensive monitoring infrastructure
– for resource (and job) monitoring
– usable by different virtual organizations
– based on an infrastructure of three different middlewares (!)

Results of the requirements analysis
– e.g. required resource state parameters
– general qualities like scalability, interoperability, standardized
  components, stackability, configurable republishers, VO views,
  many more
Evaluation of Components

Evaluation against requirements

core middleware monitoring services remained:
- Globus: MDS4
- gLite: R-GMA, BDII
- Unicore: UPL

four services in three different middlewares
- no interoperability
- a conflict of standards
A Challenge: Integration

Integration path

– **choose core**
  • Globus MDS4 (most promising, best standardized, WS-SOA)
– **instrument important resources**
  • Torque
– **implement gateways**
  • D-MON: Build a prototypical gateway BDII-MDS4
– **use / implement adapters**
  • e.g. Nagios, Ganglia, Maintenance
– **hope for convergence** of international projects
  • D-MON: Test interoperability of Unicore 6 and MDS4

Result: reference installation for monitoring in the Core D-Grid
Outlook: D-MON

- Further integration: MDS4 - gLite BDII adaptor
- Tests Unicore 6 – Globus Toolkit MDS interaction

<table>
<thead>
<tr>
<th>Consumers</th>
<th>Webservers and Portals</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GPE UNICORE</td>
<td>WebMDS</td>
<td>Jawari</td>
<td>Gridmap</td>
</tr>
<tr>
<td></td>
<td>TSS (Unicore 6)</td>
<td>MDS4 (GT4)</td>
<td>BDII (gLite)</td>
<td></td>
</tr>
<tr>
<td>Producers</td>
<td>subsystems/cluster monitoring (e.g. Ganglia)</td>
<td>sensors</td>
<td>resources</td>
<td></td>
</tr>
</tbody>
</table>
Another Challenge: Heterogenous Resource Descriptions

- standardized resource descriptions and names:
  - OGF GLUE
  - D-Grid Definition Language D-GRDL (also covering GLUE)

- further languages are used in different communities
  - e.g. RDF (Astro-Grid)
  - Proprietary Data (Jülich Resource Database)

Result: OGF GLUE was chosen for resource descriptions in the Core D-Grid
D-GRDL was extended to include GLUE
A Preliminary Framework for Customer Service Management in Grids

Service Management – Value Added Service

- Customers Monitoring Services
- Customers Accounting Services
- Customers other services

Service Management – Basic Service

- Monitoring Service Information Repository
- Accounting Service Information Repository
- other services

Grid CSM Basic Service

Operative Grid CSM Provider
- Retrieval
- Presentation Mapping
- Filter

Administrative Grid CSM Provider
- AA
- Presentation
- SLA Policy
- VO-Management

customer-specific, logical views

VOA
ROB

MN.Team
MDS4 Deployment

GT4 (OGSA WSRF-Basic Profile)

https://mds-dgrid.lrz-muenchen.de:8443

Community-Index Community A

https://mds-dgi.lrz-muenchen.de:8445

VO
RO

Site Index

https://mds-lrz.lrz-muenchen.de:8444

Site-Index Anbieter B

Site-Index Anbieter C

Ressourcenanbieter A
Ressourcenanbieter B
Ressourcenanbieter C

Einsicht durch Benutzer und Administratoren

Sitebezogene Sensoren für Wartungsmeldungen und Geokoordinaten

Lokale Indexe/ Sensoren
### Extended WebMDS: Maintenance Messages

#### Wartungszustand

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Status</th>
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<tbody>
<tr>
<td>udo-gr01.grid.uni-dortmund.de</td>
<td>Running</td>
</tr>
<tr>
<td>udo-gr02.grid.uni-dortmund.de</td>
<td>Running</td>
</tr>
<tr>
<td>liga3a.1b.de</td>
<td>Running</td>
</tr>
<tr>
<td>ggrid.uni-koeln.de</td>
<td>Running</td>
</tr>
<tr>
<td>PIK</td>
<td>Running</td>
</tr>
<tr>
<td>AstroGrid-D</td>
<td>Running</td>
</tr>
<tr>
<td>BOC</td>
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<tr>
<td>ZH</td>
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<tr>
<td>MaxPlanckUniversity</td>
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<tr>
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</table>

**Wichtig**

Wegen Wartungsarbeiten wird ARMINIUS am 6.4 von 6.00 bis 16.00 Uhr nicht einsetzbar sein.

**KTHRZ**

Aufgrund von Wartungsarbeiten steht der Cluster am 6.4.2007 von 16-20 Uhr nicht zur Verfügung.

### Site Liste

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site Name</th>
<th>Location</th>
<th>Tier/Site/Contact</th>
<th>Site/Domain/Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>udo-gr01.grid.uni-dortmund.de</td>
<td>Universität Dortmund</td>
<td>Dortmund</td>
<td><a href="mailto:grid-admin@grid.uni-dortmund.de">grid-admin@grid.uni-dortmund.de</a></td>
<td><a href="mailto:grid-admin@grid.uni-dortmund.de">grid-admin@grid.uni-dortmund.de</a></td>
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<td>Dortmund</td>
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<td><a href="mailto:grid-admin@grid.uni-dortmund.de">grid-admin@grid.uni-dortmund.de</a></td>
</tr>
<tr>
<td>liga3a.1b.de</td>
<td>Attaba 1b.de</td>
<td>Berlin/Germany</td>
<td><a href="mailto:grid-admin@my.site.net">grid-admin@my.site.net</a></td>
<td><a href="mailto:grid-admin@my.site.net">grid-admin@my.site.net</a></td>
</tr>
<tr>
<td>ggrid.uni-koeln.de</td>
<td>Universität Köln</td>
<td>Köln</td>
<td><a href="mailto:dgrid-admin@uni-koeln.de">dgrid-admin@uni-koeln.de</a></td>
<td><a href="mailto:dgrid-admin@uni-koeln.de">dgrid-admin@uni-koeln.de</a></td>
</tr>
<tr>
<td>PIK</td>
<td>PIK Potsdam, Germany</td>
<td>Potsdam, Germany</td>
<td>user petri at the domain pik-potsdam.de</td>
<td>user petri at the domain pik-potsdam.de</td>
</tr>
</tbody>
</table>
Dynamic Site Topology
(custom built MDS4 Geolocation Provider GeoMaint)
Open Issues: GridCSM

Ongoing projects
- Remote interface for the configuration of resource property providers (student project)
- a database for maintenance messages (LRZ)

Further work
- Implement filter and couple to a dynamic VO-management service (D-MON project)
- policy management
- SLA management
Thank you ...