User-Centric Monitoring of Jobs and their Resource Usage

Ralph Müller-Pfefferkorn,
Reinhard Neumann

Wuppertal, Nov. 30th 2006

ZiH
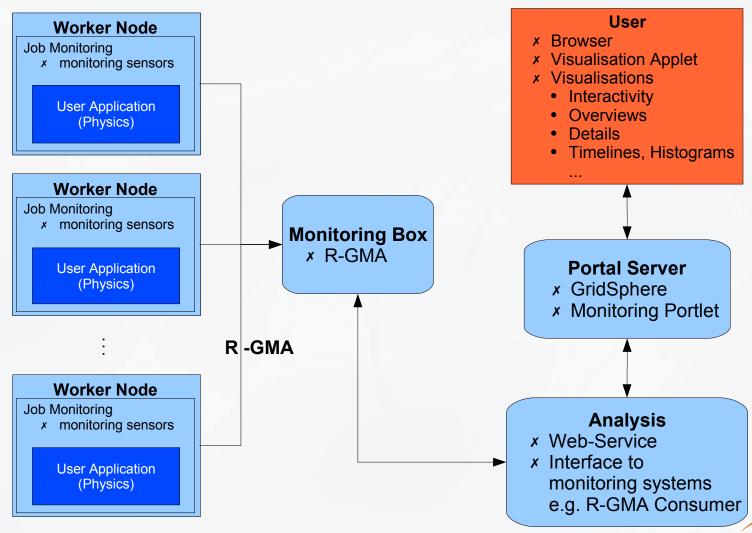Zentrum für Informationsdienste und Hochleistungsrechnen

Motivation

- Usual scenario in HEP
  - ▶ hundreds or thousands of jobs
- User needs overview what is going on with his/her jobs
  - ▶ status, runtime information (resource usage)
- Two types of users
  - ▶ physicist with his/her analyses or
    simulation production
  - ▶ resource providers who want to know whats happening on their
    machines
    or Grid management that wants to plan infrastructure
- Provide sufficient information in a helpful way
  - ▶ graphical visualisation with interactivity
  - ▶ collect and prepare useful information

Architecture

Worker Node

Job Monitoring
- ✗ monitoring sensors

User Application
(Physics)

Worker Node

Job Monitoring
- ✗ monitoring sensors

User Application
(Physics)

Worker Node

Job Monitoring
- ✗ monitoring sensors

User Application
(Physics)

R -GMA

Monitoring Box
- ✗ R-GMA

User
- ✗ Browser
- ✗ Visualisation Applet
- ✗ Visualisations
  - • Interactivity
  - • Overviews
  - • Details
  - • Timelines, Histograms
  - ...

Portal Server
- ✗ GridSphere
- ✗ Monitoring Portlet

Analysis
- ✗ Web-Service
- ✗ Interface to monitoring systems e.g. R-GMA Consumer

TECHNISCHE
UNIVERSITÄT
DRESDEN

ZIH
Zentrum für Informationsdienste
und Hochleistungsrechnen

Ralph Müller-Pfefferkorn

Information Gathering

- Currently based on LCG job monitor

  ▶ Script lcg-mon-wn is started on worker node if environment variable WN_MONITOR is set in jdl

  ▶ monitors WallClockTime, UsedCPUTime, RealMem, VirtualMem ...

  ▶ Data are written to R-GMA with a Continuous-Producer

  ▶ Table JobMonitor

- Job status information from Logging&Bookeeping

  ▶ Table JobStatusRaw

- Data are stored in R-GMA for both of the above

  ▶ Relational-Grid Monitoring Architecture

  ▶ kind of distributed relational database based on OGSA-Grid Monitoring Architecture

Information Retrieval and Analysis

- Analyser

- Web Service
  Tomcat + Axis

- Collects monitoring information

- Different monitoring systems can be plugged in
  e.g. R-GMA data with a R-GMA consumer

- Analyses data

- Prepares data for visualization

User Interface and Visualisation

- Browser based

- Portal technology: GridSphere

- Monitoring portals and services

  - ▶ call Analyser Web Service and retrieve data for visualisation

- Visualisation

  - ▶ applet, that runs in the browser on the machine of the user

  - ▶ interactivity

    - – user can click in for more information

    - – user can zoom in displays

  - ▶ see demo

Current Status

- Milestones
  - ▶ M06: evaluation of monitoring systems and selection of monitoring data
  - ▶ M12: first version of monitoring
- Prototyp of full infrastructure
  - ▶ information gathering based on LCG job monitor
  - ▶ Analyser Web Service
  - ▶ GridSphere portal and portlets
  - ▶ visualisation applets
- reads LCG job monitor information and L&B status

Ongoing and Future Work

- Extend LCG Job Monitor

  - ▶ make script customisable and configurable

  - ▶ add more monitoring information (e.g. I/O data, network ...)

- Add authentication and authorisation

  - ▶ integrate VOMS to authorize access to data

  - ▶ normal users see only their data, resource providers only their cluster, management can see more

Ongoing and Future Work

- Persistent storage of resource usage for resource providers

  - ▶ R-GMA is only temporary storage

  - ▶ „dump" of selected relevant data to a database

  - ▶ provide the same user interface as for current data

- Add other monitoring systems

  - ▶ analyser can be extended with monitoring systems

  - ▶ e.g. EGEE wants to extend L&B information in gLite

  - ▶ e.g. GridIce for resource providers