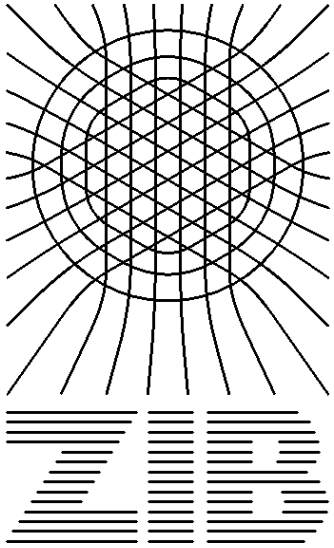
Resource Management Task Report



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Outline

1. Resource Management System
2. Information Providers

Resource Management System (1)

- recap from architecture document -

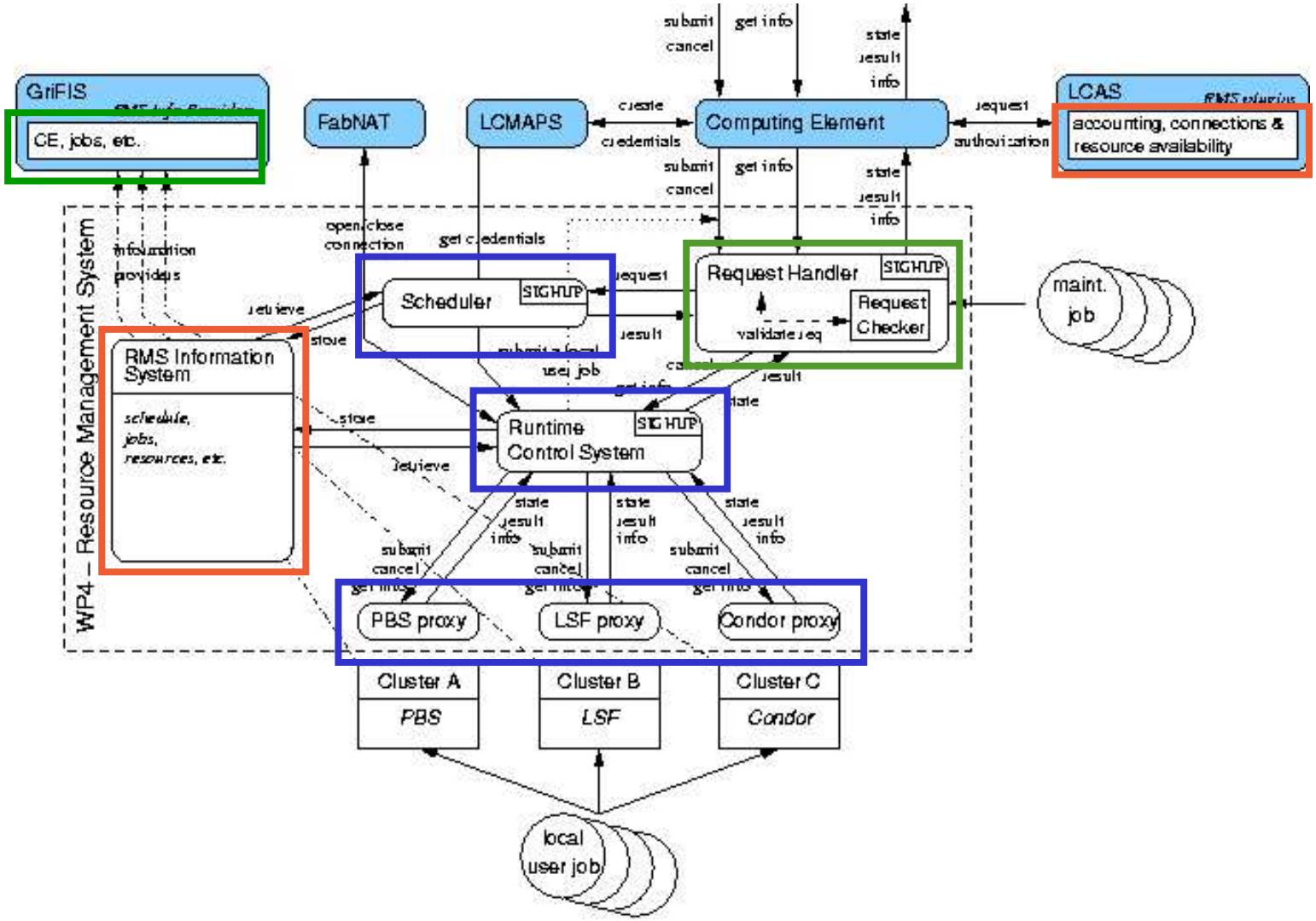
- handle resource requests from WP1 (grid user jobs)
- handle local resource requests (local user jobs)
- support for automatic fabric management (WP4)
  - add/delete nodes
  - maintenance tasks (jobs)

schedule all resulting jobs

- interfaces for common batch systems (e.g. PBS, LSF, Condor)
- provide advanced scheduling features
  - backfill
  - advance reservation
  - load balancing
- (site-level based accounting)

Resource Management System (2)

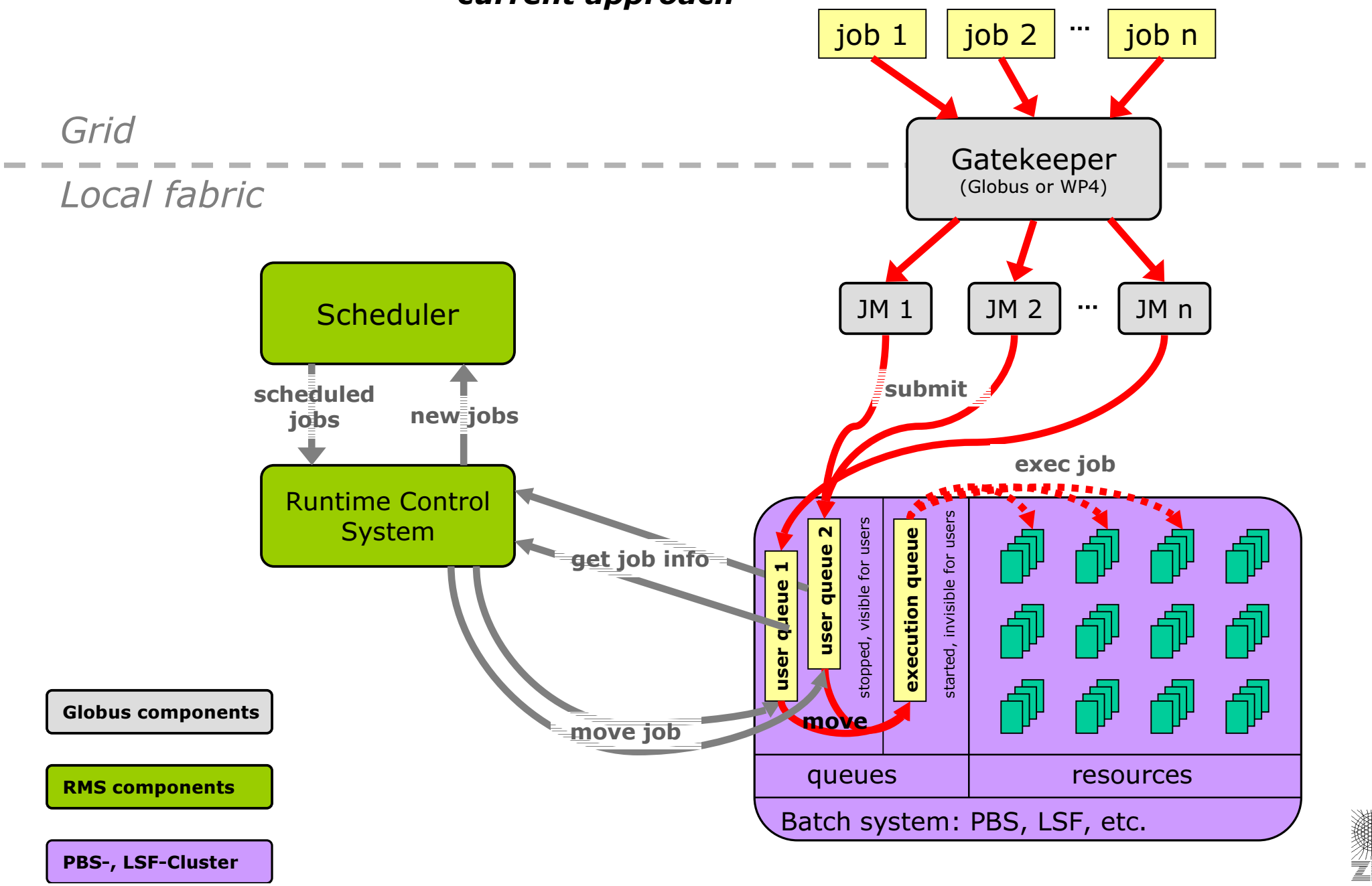
- first approach (arch./design document) -



- main components: **Request Handler**, **Request Checker**, **Runtime Control System**, **Proxies**, **Scheduler**, **RMS Information System**, **plugins for LCAS**, **Information Providers**
- job entries: grid jobs (Request Handler), local jobs (batch systems), maint. jobs (Request Handler)

Resource Management System (3a)

- current approach -



Resource Management System (3b)

- current approach -

- redesign to keep compatibility with Globus job management
- key features
  - support multiple clusters with one RCS
  - robustness (recover smoothly from crashes)
  - scalability – needs evaluation with prototype
  - fully configurable

  (will probably use Maui as scheduler)

Resource Management System (4)
- implementation status R1.3 -

- prototypes for RCS, Scheduler, and Proxies (scripts)

- Scheduler: **very** simple
  - FIFO
  - maintains list of jobs
  - add jobs to the end of the list (duplicates possible!)
  - only one execution queue (one cluster only!), set by RCS

- RCS: limited (functionality, PBS), but works
  - fetches job info from specified queues via scripts (easy to extend, e.g. LSF)
  - calls Scheduler for new jobs (maintains list of known jobs)
  - ask Scheduler for jobs in range (X,end) in the schedule (list)
  - moves jobs immediately to execution queue via script (easy to extend, e.g. LSF)
  - waits some time before next fetch

Resource Management System (5)

- future developments, open questions -

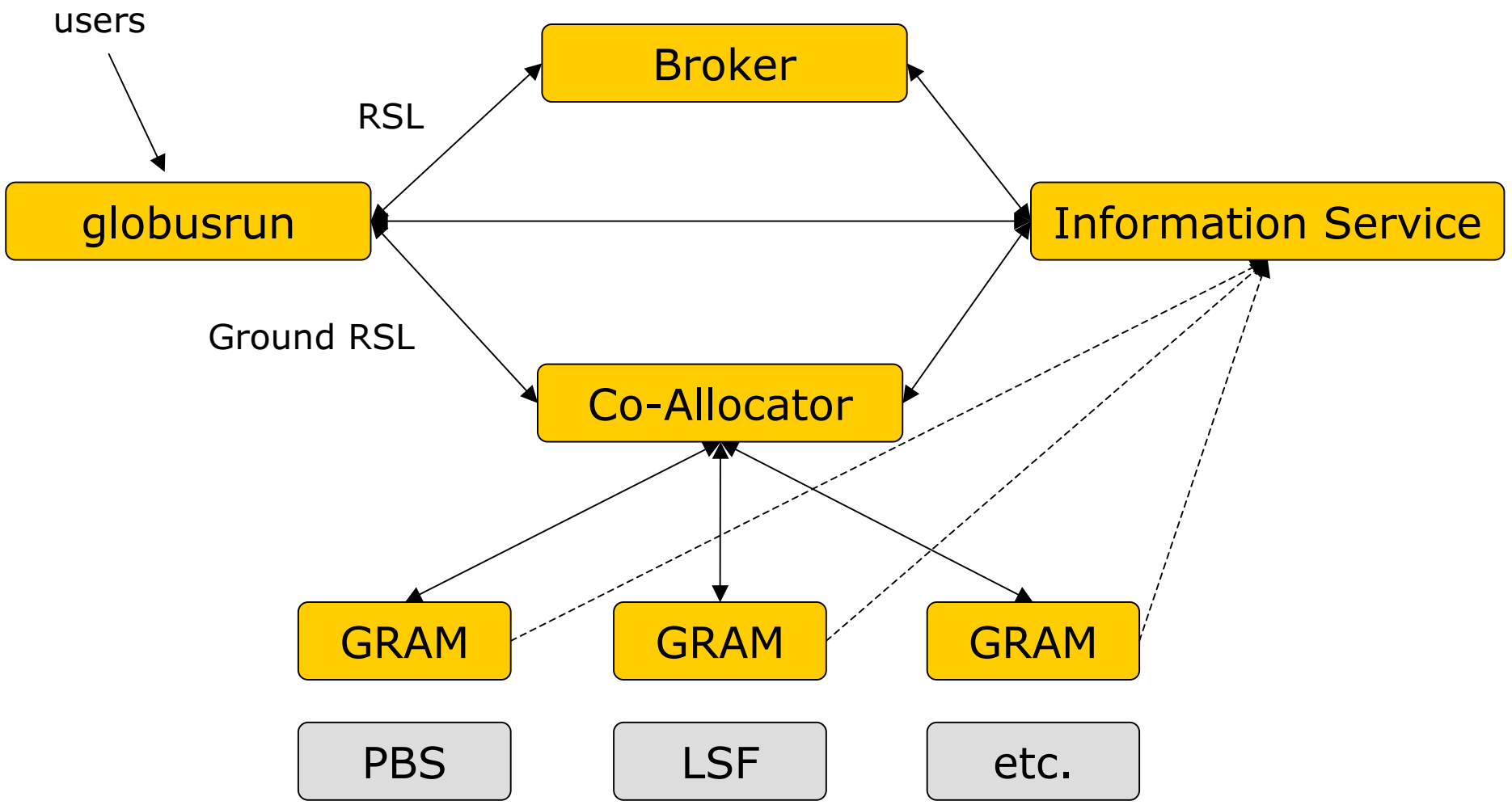
- use time based schedule (not a list) [R1.4]
- support LSF, BQS [R1.4-2]
- maintenance
  - node on/off [R1.4-2]
  - jobs with reservation [> R2]
  - submission (via batch systems, grid, special interface?) [>= R2]
- use Maui as Scheduler (should enable adv. reservation, backfill) [R2]
  - scalability [> R2]
- interface for WP1 to obtain accounting information [R2]
- support multiple clusters [>= R2], with load balancing [> R2]

- (currently) open questions:
  - load balancing (update Globus job manager, e.g. job id, etc.)
  - node on/off should only affect the specified node
  - maintenance with Condor

Information Providers

- current version: 1.3.3-1
  - three scripts: PBS, LSF, Condor
  - improved calculation of some attributes (EstimatedTraversalTime, WorstTraversalTime)
- next step (still R1.3, because of RMS semantics)
  - only show submission queues
- R1.4: new schema

Grid Computing à la Globus



GRAM – Globus Resource Allocation Manager
RSL – Resource Specification Language