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Motivation

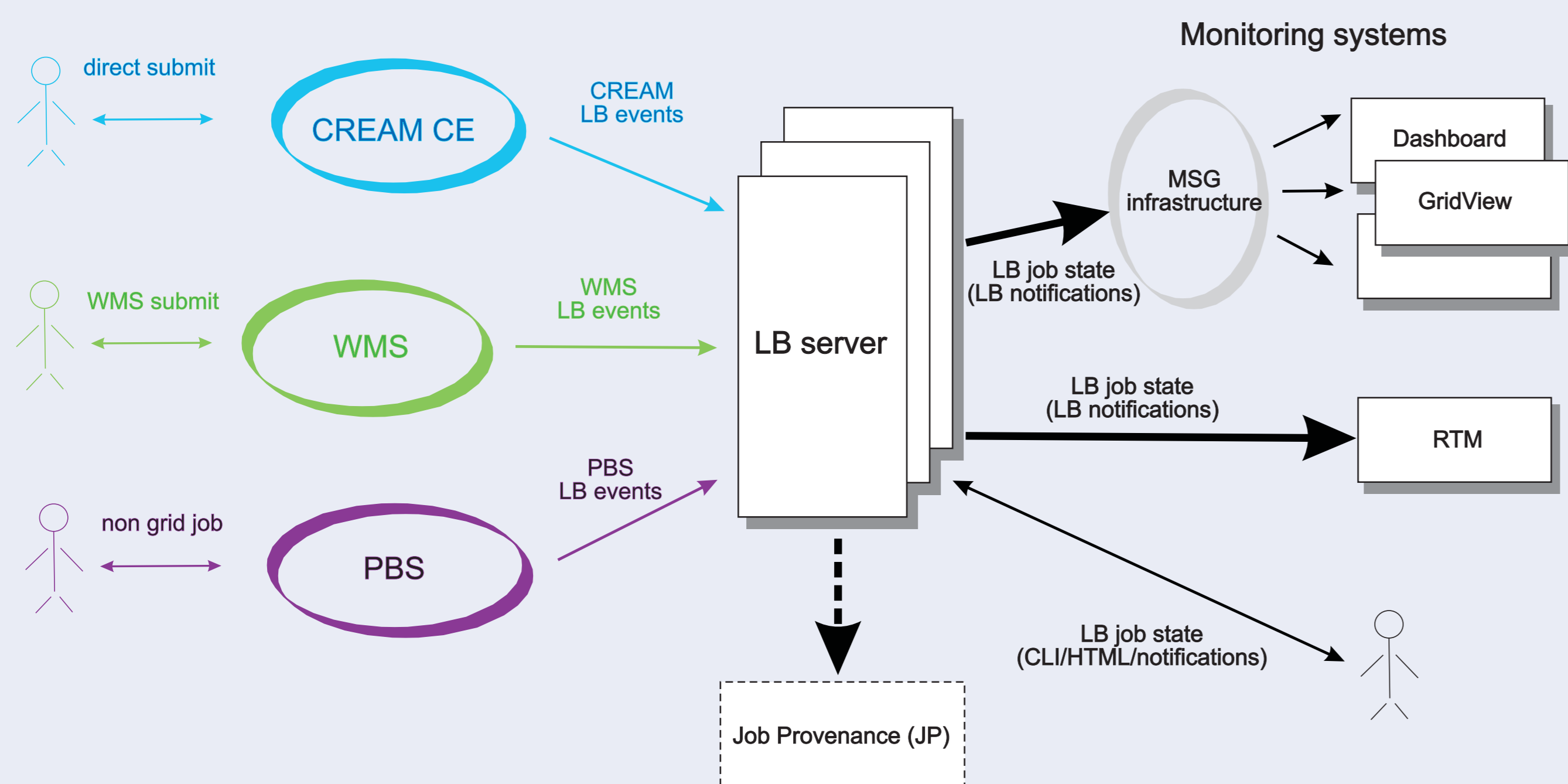
Logging and Bookkeeping (L&B) service is designed to provide information on jobs in gLite. Individual users, administrators, and monitoring tools are the primary consumers of L&B data.

Originally, all gLite jobs were submitted via WMS, therefore L&B was tightly coupled with it. However, recently massive direct submissions to computing elements are also used. Those jobs, not handled by WMS, are also not captured by L&B, forcing the users to use different interface to query job state.

We present support of native (i.e. non-WMS) CREAM jobs in L&B which addresses the problem. Moreover, this turns to be valuable even for WMS jobs – more information is directly available by following the link to CREAM job in L&B.

Overview

Grid components handling jobs (WMS, CREAM) produce events which are **specific** to the job type, and they push them to L&B.



Then L&B processes the events, using specific code per job type, to produce **uniform** view on the job state finally.

Main Achievements

- **Uniform view on WMS and CREAM jobs**
- **Full L&B functionality (aggregate queries, notifications) available for CREAM jobs**
- **Reliable uniform input for monitoring tools (RTM, Dashboard)**
- **User queries offloaded from CE**

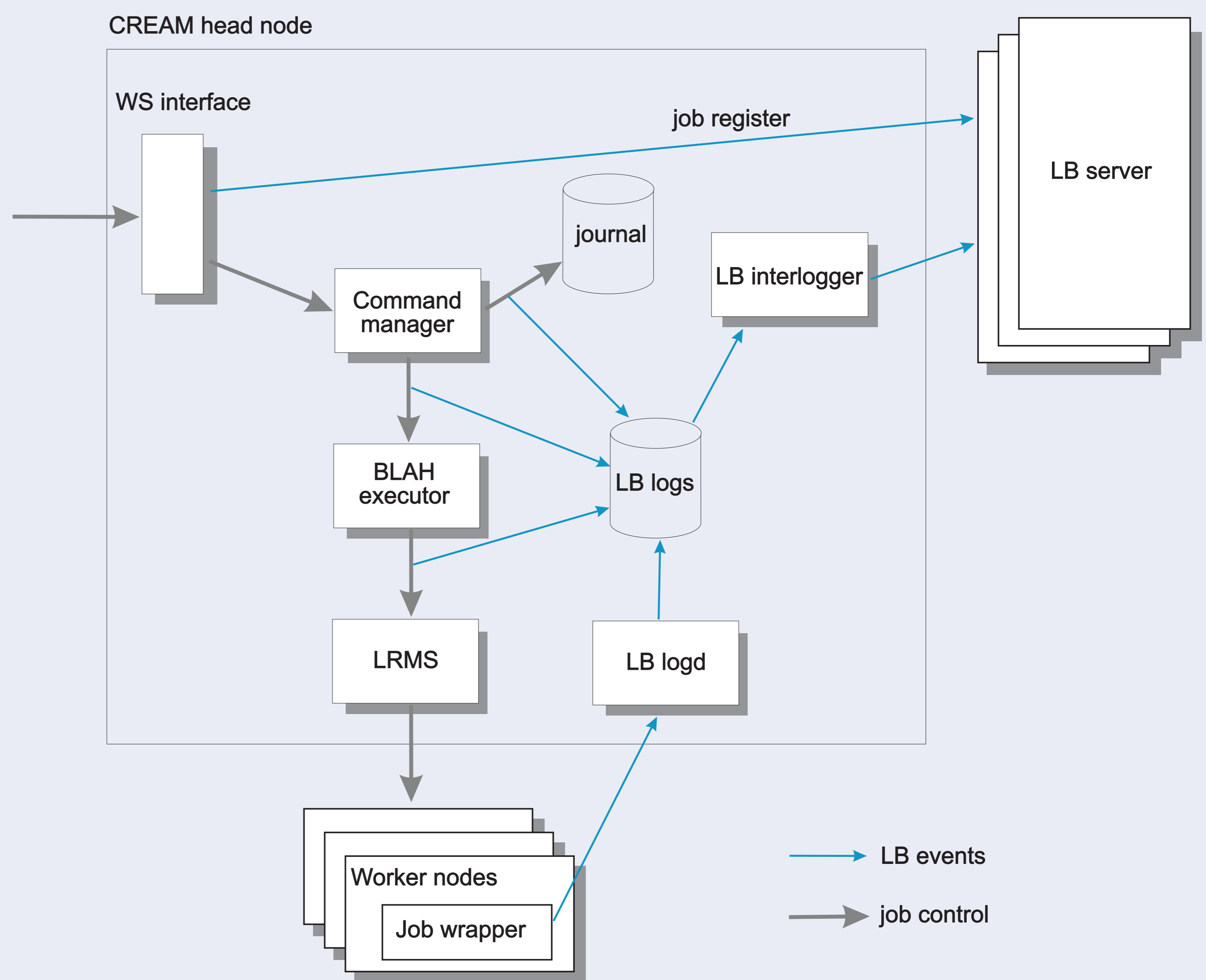
References

- [1] M. Ruda et al., Job Centric Monitoring on the Grid – 7 years of experience with L&B and JP services, Proc. CESNET Conference 2008.
- [2] C. Aiftimiei et al., Using CREAM and CEMON for job submission and management in the gLite middleware, to appear in Proc CHEP'09, 2009.
- [3] J. Andreeva et al., Monitoring Grid Jobs with L&B Notifications in GridView and Experiment Dashboard, EGEE'08 conference, 2008.
- [4] A. Křenek et al., New implementation of RTM access to L&B data: status and migration plans, EGEE User Forum, 2009.

Implementation

CREAM instrumentation

Components of CREAM are instrumented to generate **L&B events** on important points during processing the job, shown in the diagram bellow.



L&B Java client

We provide **native Java** implementation of the L&B client developed for this purpose. Usual two ways of L&B communication are preserved:

- **Synchronous** job registration, connecting directly to L&B server.
- Other **asynchronous** events via L&B interlogger.

CREAM-specific L&B events

Apart of common job registration CREAM uses a set of dedicated L&B events:

- **Store** when a command is stored into permanent storage
- **Start/Cancel/Suspend/Resume** when the command is accepted or executed by a CREAM component
- **Running/ReallyRunning/Done** when the job/payload starts and finishes

Event processing

L&B server routes CREAM-specific events to a **specialized state machine** which follows internal logic matching to CREAM processing. Resulting job state presented by L&B is consistent with direct CREAM job state queries.

Job state mapping

Despite job states are named slightly differently in L&B and CREAM, their meaning is quite similar and a straightforward mapping exists:

L&B	CREAM	meaning
Submitted	Registered	job known to the system
Waiting	Pending	job processing started
Ready	–	not applicable for CREAM
Scheduled	Idle	queued in LRMS
Running	Running	job wrapper started
+ payload_running	ReallyRunning	job payload started
Done(OK)	Done-OK	finished successfully
Done(Failed)	Done-Failed	failed

L&B still computes **L&B job state**, yielding uniform output for all job types. The **CREAM job state** is included as additional field in state details.



The EGEE project is building a Grid infrastructure for the scientific community. Grids are networks of computers spread across many sites but able to act together to provide a range of large scale facilities, from incredible processing power and mass storage to a platform for international collaboration.