Advancements in UNICORE accounting

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Outline

- UNICORE Accounting system overview
- New core features
- Accounting portal
- Future work
- Short portal demo
**Fundamental facts**

- “RUS” used for legacy reasons.
- Accounting data retrieved from two sources:
  - XNJS processor (distributed with Unicore/X)
  - Standalone LRMS agent
- Records merged by a central RUS-service
  - can be exported to other services
- Communication via JMS messaging
- Record format based on the OGF UsageRecord.
- Java web application available as a visualization tool
The big picture

1. submit job

2. queue

3,... update UR

4. queue

A. monitor BSS

B. update UR

7. submit

accounting data

Batch Subsystem

TSI

Job Processor

XNJS

RUS Service

Unicore/X

BSS Adapter

Client
Recent new features

- XNJS job-processor module integrated with Unicore/X since 6.5
- Added support for SLURM in bss-adapter
  - along with Torque and SGE/OGE
- Enhanced the collected data
  - e.g. maximum job time known after submission
  - U/X time (start at U/X, submit to BSS, ...)
- More reliable merging
  - revised algorithms handling mostly all, even very weird cases
- APEL export (EMI CAR & EMPA support)
Another big picture
Export to 3rd party systems

JMS message broker (ActiveMQ)

client tier
APEL
Other system

service tier
CAR export
RUS Service
Other export
RUS DAO (myBATIS)
RDBMS (H2/MySQL)
USE hosting environment

Job processor
Unicore/X

target system tier
RUS BSS Adapter (LRMS specific)
LRMS
The 1.x DB layer

- 1.x version featured a central DB, exclusively maintained by rus-service.
  - hybrid, XML + caching columns
- Around 1,000,000 job records, the DB started to become a bottleneck
  - record merging/insertion and queries
- The portal UI had its own copy of the DB with custom format.
  - same problems with performance, 'custom' bugs, ...
Old, 1.x DBs

- JMS message broker (ActiveMQ)
- Client tier: UCC, RUS plugin
- Service tier: Accounting Portal, Portal DAO (Spring JDBC), RUS Service, Job processor, Portal DAO (Spring JDBC), USE hosting environment, RUS DAO (myBATIS), RDBMS (H2/MySQL)
- Target system tier: RUS BSS Adapter (LRMS specific), LRMS

DB Systems:
- Old, 1.x DBs
- RDBMS (MySQL)
- RDBMS (H2/MySQL)
- RDBMS (MySQL)
The new DB layer

- Database layer is now a separate software component, shared by the portal and service.
- A table with daily job summaries was greatly enhanced and became a primary source for reporting queries.
  - It holds the data which is 90% of the time sufficient for administrators/management.
- Both jobs and summaries tables have separate 'rolling' mechanism:
  - Old records are automatically moved to 'history' tables (by default after 6m and 3 years).
The big picture
2.x version

JMS message broker (ActiveMQ)

Accounting Portal

RUS Service

RUS DAO (myBATIS)

RDBMS (H2/MySQL)

USE hosting environment

Job processor

Unicore/X

RUS BSS Adapter (LRMS specific)

LRMS

client tier

service tier

target system tier
The new portal

- A common database layer used.
  - Code elimination, uniform performance characteristics
  - Accounting data not processed by the portal anymore.
- JMS and own database are now not used
  - May be easily readded, if it is needed to have a separate portal DB.
- The fundamental interface parts are based on the daily-aggregated information
  - Greatly increased performance
The search criteria panel was extended.
It is shared between data presentation views.
The new portal (3)

- Search criteria are automatically filtered for users with limited permissions.
  - Only criteria available for the user-visible jobs are presented.
- Fully rewritten charts view.
  - Still a lot to improve here...
Current & future work

- Additional enhancements in web UI
- Accounting of reservations
- (?) LoadLeveler support
- (?) Support for separate DB in portal (still the same format as in case of rus-service).
JMS message broker (ActiveMQ)

Accounting Portal

RUS DAO (myBATIS)

RDBMS (H2/MySQL)

UCC

RUS plugin

client tier

UR export

RUS Service

RUS DAO (myBATIS)

RDBMS (H2/MySQL)

USE hosting environment

job processor

Unicore/X

cservice tier

RUS BSS Adapter (LRMS specific)

LRMS

target system tier