PAUL SCHERRER INSTITUT

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Wir schaffen Wissen – heute für morgen

**Paul Scherrer Institut**

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Forum on Scheduler and Queuing Systems

# SGE 6.2u5 Accounting and Reporting Console ( ARCo )

**Intro**
SGE @ PSI T3
qacct vs DB
SGE dbwriter
DB CLI
DB phpMyAdmin
DB ARCo
DB cron+arcorun
Conclusions

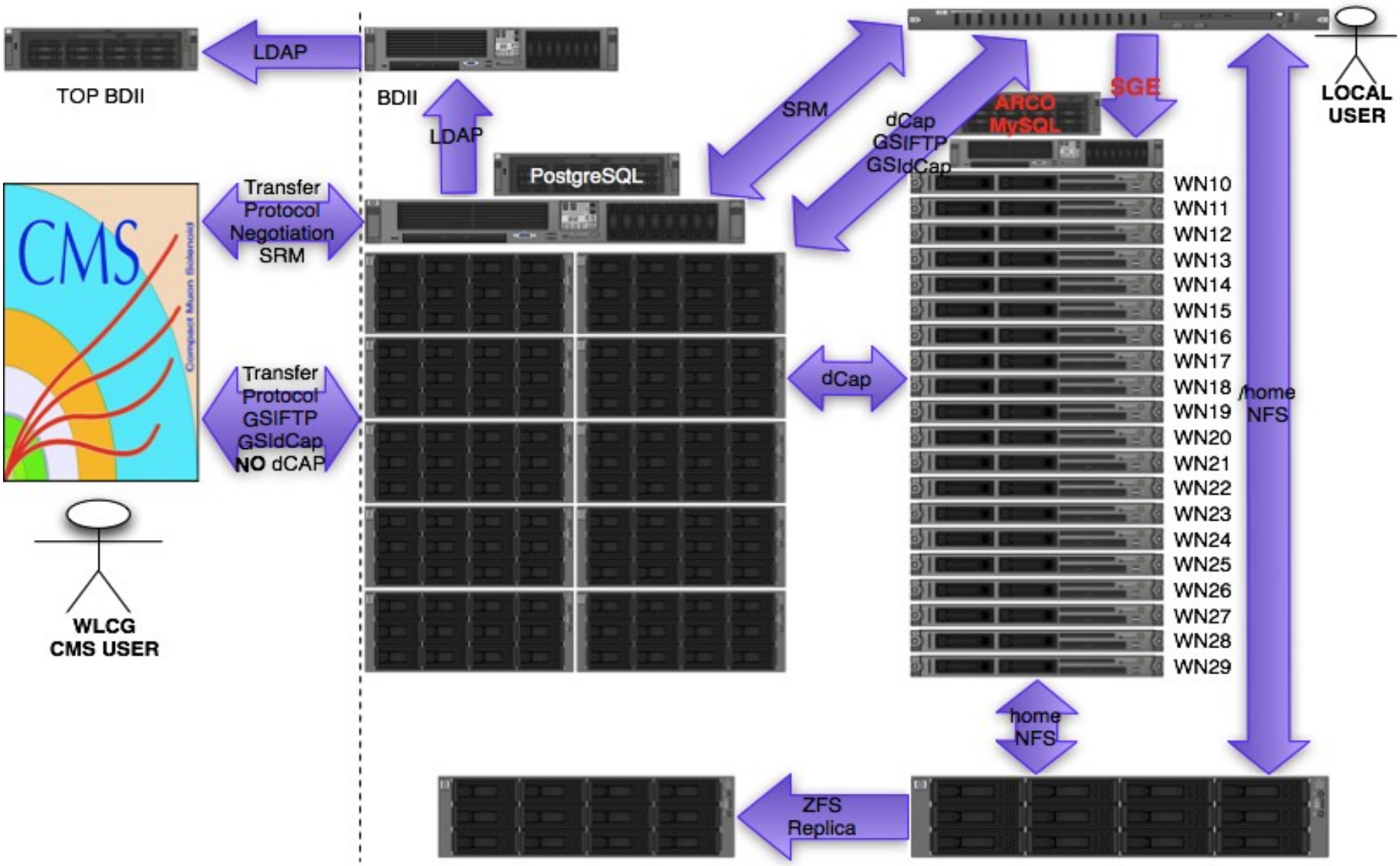
# Contents and Goals

We want to share practical experiences on:

- SGE Configuration @ CMS GRID T3 site.
- Accounting by **qacct** vs Accounting+Reporting by **SQL**
- How to setup the SGE SQL module **dbwriter**
- How to browse SGE statistics ( **CLI**, **phpMyAdmin, ARCo** )
- How to graph SGE statistics ( **ARCo** )
- How to generate HTML,CSV,PDF,XML statistics by **arcorun**

SGE ARCO Ref:
http://wikis.sun.com/display/gridengine62u5/Accounting+and+Reporting+Console

# SGE 6.2u5 Accounting and Reporting Console ( ARCo )



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Which SGE configuration ? Quite simple so far.
2 queues, **short.q** (1h) > **all.q** (48h)
max 8 jobs per node ( HW constraints like RAM size )

Solution:
Assigned **sequence number** to short.q and all.q
Requested to the SGE scheduler to order **by sequence**
Enforced a **Quota Reservation** to avoid > 8 jobs

```
# qconf -srqs max_jobs_per_host
{
   name         max_jobs_per_host
   description  NONE
   enabled      TRUE
   limit        queues all.q,short.q hosts {@Blades-type-6270} to slots=8
}
```

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SGE 6.1u4 is respecting the **Quota Reservation**:

```
# qquota
resource quota rule limit                filter
--------------------------------------------------------------------------------
max_jobs_per_host/1 slots=8/8 queues all.q,short.q hosts t3wn10
max_jobs_per_host/1 slots=8/8 queues all.q,short.q hosts t3wn11
max_jobs_per_host/1 slots=8/8 queues all.q,short.q hosts t3wn12
max_jobs_per_host/1 slots=8/8 queues all.q,short.q hosts t3wn13
...
```

Where { t3wn10, t3wn11, t3wn12, t3wn13, ... } = {@Blades-type-6270}

SGE **Quota Reservation** Reference:
http://wikis.sun.com/display/GridEngine/Managing+Resource+Quotas

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- SGE 6.1u4 manages the 20 Blades and since the beginning we enabled **accounting=true,reporting=true, joblog=true** in the its main configuration.

- Today we have collected 200MB **accounting** file and 800MB **reporting** file.

- The **accounting** file is parsed only by the SGE utility **qacct** while the **reporting** file, that contains job accounting, job log, host load and consumables, queue status, ... can be easily imported into a **MySQL DB**, **PostgreSQL DB** or **Oracle** DB.

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We can retrieve limited statistics by using the SGE utility **qacct** and its input the **accounting** file :

# **qacct**
GE 6.1u4
usage: qacct [options]

| | |
|---|---|
| [-A account_string] | jobs accounted to the given account |
| [-b begin_time] | jobs started after |
| [-d days] | jobs started during the last d days |
| [-D [department]] | list [matching] department |
| [-e end_time] | jobs started before |
| [-g [groupid\|groupname]] | list [matching] group |
| [-h [host]] | list [matching] host |
| [-help] | display this message |
| [-j [job_id\|job_name\|pattern]] | list all [matching] jobs |
| [-l attr=val,...] | request given complex attributes |
| [-o [owner]] | list [matching] owner |
| [-pe [pe_name]] | list [matching] parallel environment |
| [-P [project]] | list [matching] project |
| [-q [queue]] | list [matching] queue |
| [-slots [slots]] | list [matching] job slots |
| [-t taskid[-taskid[:step]]] | list all [matching] tasks (requires -j option) |
| [[-f] acctfile] | use alternate accounting file |

| | |
|---|---|
| begin_time, end_time | [[CC]YYMMDDhhmm[.SS] |
| queue | [cluster_queue\|queue_instance\|queue_domain\|pattern] |

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**An example of qacct output about last 30 days T3 cluster usage, times in seconds, RAM in Bytes:**

# **qacct** -o -d 30 #

| OWNER | WALLCLOCK | UTIME | STIME | CPU | MEMORY | IO | IOW |
|---|---|---|---|---|---|---|---|
| User1 | 5843 | 3561 | 191 | 3752 | 2164.755 | 0.000 | 0.000 |
| User2 | 599796 | 506138 | 4288 | 560910 | 747466.936 | 0.000 | 0.000 |
| User3 | 1413768 | 216090 | 19838 | 237978 | 89306.556 | 0.000 | 0.000 |
| User4 | 168594 | 56772 | 3399 | 60171 | 39688.083 | 0.000 | 0.000 |

...

**The today T3 usage for a specific server t3wn10:**

# **qacct** -o -d 1 -h t3wn10

| HOST | OWNER | WALLCLOCK | UTIME | STIME | CPU | MEMORY | IO | IOW |
|---|---|---|---|---|---|---|---|---|
| t3wn10 | User1 | 13003 | 1585 | 60 | 1669 | 703.511 | 0.000 | 0.000 |
| t3wn10 | User2 | 472 | 411 | 0 | 416 | 55.475 | 0.000 | 0.000 |
| t3wn10 | User3 | 1063 | 665 | 22 | 792 | 477.787 | 0.000 | 0.000 |
| t3wn10 | User4 | 1550 | 1163 | 13 | 1176 | 644.035 | 0.000 | 0.000 |
| t3wn10 | User5 | 82720 | 82267 | 32 | 82299 | 178002.894 | 0.000 | 0.000 |

**Accounting for a specific JOB ( qacct output ordered in columns to show the values ):**

# **qacct** -j 753172

| | | | | | |
|---|---|---|---|---|---|
| qname | all.q | slots | 1 | cpu | 95 |
| hostname | t3wn17 | failed | 0 | mem | 38.557 |
| group | cms | exit_status | 0 | maxvmem | 530.441M |
| owner | User1 | ru_wallclock | 354 | | |
| project | NONE | ru_utime | 84 | | |
| department | defaultdepartment | ru_stime | 11 | | |
| jobname | background_TreeProducer | ru_maxrss | 0 | | |
| jobnumber | 753172 | ru_ixrss | 0 | | |

..

| | |
|---|---|
| qsub_time | Fri May 6 17:20:48 2011 |
| start_time | Fri May 6 17:39:05 2011 |
| end_time | Fri May 6 17:44:59 2011 |
| granted_pe | NONE |

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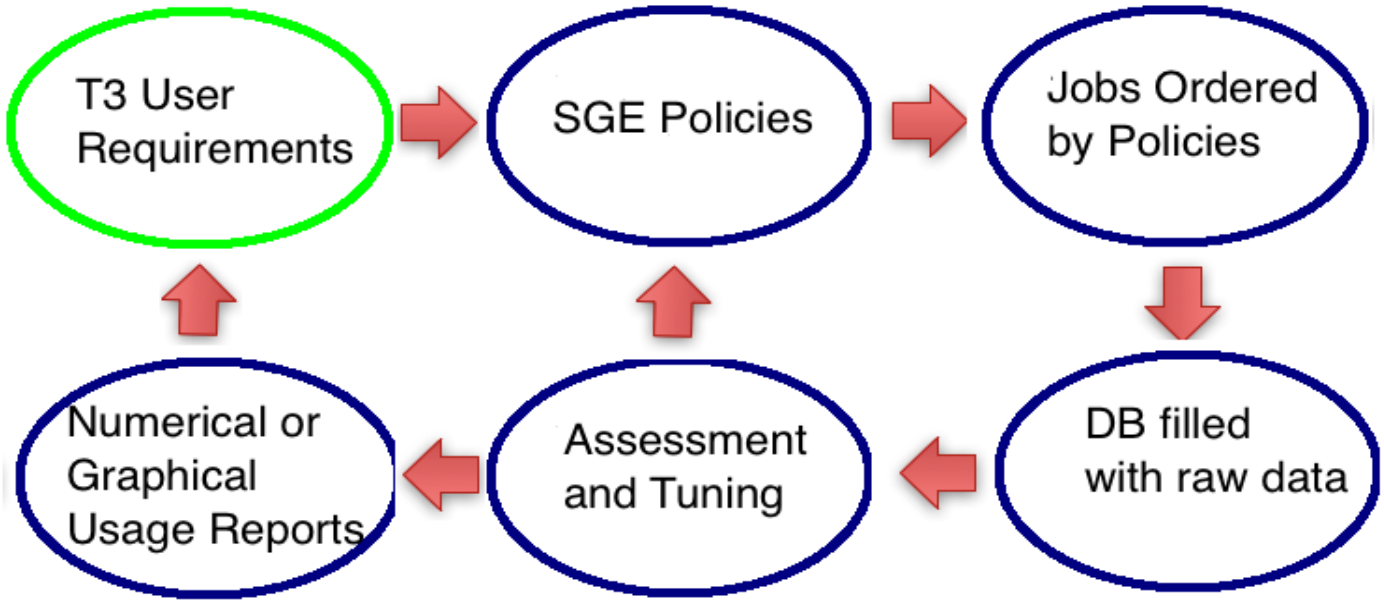
- The utility **qacct** is useful but we can't easily get sophisticated statistics, also it's output is just **plain text**.
- **qacct** parses the **accouting** file every time, performances could be bad for big sites.
- Luckily it's possible to import all the information saved in the **reporting** file inside a DB; once in production, the DB becomes a tool to design policies, (re)tune the scheduler and eventually verify if the initial policies were respected.



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Raw reporting data is generated by **sge_qmaster.** This raw data is stored in the $SGE_ROOT/$SGE_CELL/common/**reporting** file. The **dbwriter** daemon reads the raw data in the **reporting** file and writes it to the SQL reporting database, where it can be accessed by tools like **mysql**, **phpMyAdmin**, **ARCo**, ..

The **dbwriter** provides functionality that helps you to compute new values and **insert these new values into the Database**:

**Derived Values,** which values to calculate and the rules to compute:
average queue utilization per hour,
number of jobs finished per host,
number of jobs finished per user, ...

**Deletion Rules.** you can configure **how long to keep data and what to delete:**
Job, job_log, share_log, host_values,
queue_values, project_values, department_values,
user_values, group_values, advanced reservation.

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## How to install **dbwriter** ( already installed MySQL + created MySQL users **arco_write** and **arco_read** )

```
# yum install sun-sge-arco-6.2-5.noarch.rpm
# qconf -se global | grep repo
  report_variables      cpu,np_load_avg,mem_free,virtual_free
# qconf -ssconf | grep schedd_job_info
   schedd_job_info                true
# yum install mysql-connector-java.x86_64
# cd $SGE_ROOT/sge/dbwriter/lib && ln -s .../mysql-connector-java.jar
# cd $SGE_ROOT/dbwriter && ./inst_dbwriter
# All parameters are now collected
  -----------------------------
  SGE_ROOT=/sge/gridware/sge
  SGE_CELL=default
  JAVA_HOME=/etc/alternatives/jre (1.6.0_17)
  DB_URL=jdbc:mysql://localhost:3306/sge_arco
  DB_USER=arco_write
  READ_USER=arco_read
  INTERVAL=120
  SPOOL_DIR=/sge/gridware/sge/default/spool/dbwriter
  DERIVED_FILE=/sge/gridware/sge/dbwriter/database/mysql/dbwriter.xml
  DEBUG_LEVEL=FINE
```

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## Once the Java daemon **dbwriter** is installed you'll get:

# /gridware/sge/default/common/**dbwriter.conf**
# /gridware/sge/dbwriter/database/mysql/**dbwriter.xml**
# /gridware/sge/default/spool/dbwriter/**dbwriter.log**
# /etc/init.d/**sgedbwriter**.p6444 [**start**|**stop**] [-debug]
When started it will look for the **reporting** file, it will import its content into MySQL, and it will **remove** the **reporting** file. **( Some GRID SW affected..)**

Our 800MB **reporting** file took 1h to process on a VMWare appliance and it produced a 1.2GB MySQL DB.

/var/lib/mysql/sge_arco/sge_ar_attribute.MYI
/var/lib/mysql/sge_arco/sge_ar_log.MYI
/var/lib/mysql/sge_arco/sge_ar.MYI
/var/lib/mysql/sge_arco/sge_ar_resource_usage.MYI
/var/lib/mysql/sge_arco/sge_ar_usage.MYI
/var/lib/mysql/sge_arco/sge_checkpoint.MYI
/var/lib/mysql/sge_arco/sge_department.MYI
/var/lib/mysql/sge_arco/sge_department_values.MYI
/var/lib/mysql/sge_arco/sge_group.MYI
/var/lib/mysql/sge_arco/sge_group_values.MYI
/var/lib/mysql/sge_arco/sge_host.MYI
/var/lib/mysql/sge_arco/sge_host_values.MYI
/var/lib/mysql/sge_arco/sge_job_log.MYI
/var/lib/mysql/sge_arco/sge_job.MYI
/var/lib/mysql/sge_arco/sge_job_request.MYI
/var/lib/mysql/sge_arco/sge_job_usage.MYI
/var/lib/mysql/sge_arco/sge_project.MYI
/var/lib/mysql/sge_arco/sge_project_values.MYI
/var/lib/mysql/sge_arco/sge_queue.MYI
/var/lib/mysql/sge_arco/sge_queue_values.MYI
/var/lib/mysql/sge_arco/sge_share_log.MYI
/var/lib/mysql/sge_arco/sge_statistic.MYI
/var/lib/mysql/sge_arco/sge_statistic_values.MYI
/var/lib/mysql/sge_arco/sge_user.MYI
/var/lib/mysql/sge_arco/sge_user_values.MYI
/var/lib/mysql/sge_arco/sge_version.MYI

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## The SGE DB is configured with many useful VIEWs;

mysql> describe **view_accounting;**

| Field | Type | Null | Key | Default | Extra |
|---|---|---|---|---|---|
| job_number | int(11) | YES | | NULL | |
| task_number | int(11) | YES | | NULL | |
| pe_taskid | varchar(128) | YES | | NULL | |
| name | varchar(512) | YES | | NULL | |
| groupname | varchar(50) | YES | | NULL | |
| username | varchar(50) | YES | | NULL | |
| account | varchar(512) | YES | | NULL | |
| project | varchar(512) | YES | | NULL | |
| department | varchar(512) | YES | | NULL | |
| submission_time | datetime | YES | | NULL | |
| ar_parent | decimal(38,0) | YES | | NULL | |
| start_time | datetime | YES | | NULL | |
| end_time | datetime | YES | | NULL | |
| wallclock_time | int(11) | YES | | NULL | |
| cpu | double | YES | | NULL | |
| mem | double | YES | | NULL | |
| io | double | YES | | NULL | |
| iow | double | YES | | NULL | |
| maxvmem | double | YES | | NULL | |
| exit_status | int(11) | YES | | NULL | |

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## Queries by CLI:

**Who were the most WALL TIME demanding Users during May 2010 ?**

```
mysql>
  SELECT username AS "user", SUM(wallclock_time)/86400 AS
        SUM_WALL_day,
              SUM(cpu)/86400 AS
                    SUM_CPU_days
                       FROM view_accounting
                          WHERE start_time >= '2010-05-01'
                             AND end_time <=  '2010-05-31'
                         GROUP BY username
                            ORDER BY SUM_WALL_days DESC
                               LIMIT 6;
+---------+--------------------+----------------------+
| user      SUM_WALL_days   SUM_CPU_days     |
+---------+--------------------+----------------------+
| User1   |     440.3896       | 317.3992349537     |
| User2   |     176.8276       |   78.780206944444 |
| User3   |     169.7874       | 153.55457488426   |
| User4   |     117.1301       |  109.74166909722  |
| User5   |      48.8946       |    12.120398263889 |
| User6   |      33.6872       |    25.889778240741 |
+---------+--------------------+----------------------+
```

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**And the most efficient users, again during May 2010 ?**

```
mysql>
  SELECT username AS "user",
   round((SUM(cpu)/86400)/(SUM(wallclock_time)/86400),2) as Efficiency
     FROM view_accounting
       WHERE start_time >= '2010-05-01'
            AND end_time <= '2010-05-31'
              GROUP BY username
                 ORDER BY Efficiency DESC ;
+------------+------------+
| user           Efficiency |
+------------+------------+
| User1      |       1.00 |
| User2      |       0.95 |
| User3      |       0.94 |
| User4      |       0.94 |
| User5      |       0.90 |
....
| UserX      |       0.17 |
| UserY      |       0.11 |
+------------+------------+
```

**We hope UserY wasn't the most WALL TIME demanding user !** .

# SGE 6.2u5 Accounting and Reporting Console ( ARCo )

phpMyAdmin

localhost ▸ sge_arco ▸ view_job_log

Browse | Structure | SQL | Search | Tracking | Insert | Export | Drop

Showing rows 0 - ... [1] (Query took 0.1813 sec)

```
SELECT *
FROM `view_job_log`
LIMIT 0 , 30
```

Profiling [ Edit ] [ Explain SQL ] [ Create PHP Code ] [ Refres

Show : 30 row(s) starting from record # 0

in horizontal mode and repeat headers after 100 cells

+ Options

sge_arco (44)

- base_for_jobs_count
- sge_ar
- sge_ar_attribute
- sge_ar_log
- sge_ar_resource_usage
- sge_ar_usage
- sge_checkpoint
- sge_department
- sge_department_values
- sge_group
- sge_group_values
- sge_host
- sge_host_values
- sge_job
- sge_job_log
- sge_job_request
- sge_job_usage
- sge_project
- sge_project_values
- sge_queue
- sge_queue_values
- sge_share_log
- sge_statistic
- sge_statistic_values
- sge_user
- sge_user_values
- sge_version
- view_accounting
- view_ar_attribute
- view_ar_log
- view_ar_resource_usage
- view_ar_time_usage
- view_ar_usage
- view_department_values
- view_group_values
- view_host_values
- view_jobs_completed
- view_job_log
- view_job_times
- view_job_times_subquery
- view_project_values
- view_queue_values
- view_statistic
- view_user_values

| job_number | task_number | pe_taskid | name | groupname | username | account | project | department | time | event |
|---|---|---|---|---|---|---|---|---|---|---|
| 665403 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | sent |
| 665404 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | sent |
| 665405 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | sent |
| 665406 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | sent |
| 665407 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | sent |
| 665408 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | sent |
| 665409 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | sent |
| 665410 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | sent |
| 665411 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | sent |
| 665393 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | delivered |
| 665394 | -1 | NONE | sdevissc_crab_0_110223_192757_w6ei38 | cms | sdevissc | sge | | defaultdepartment | 2011-02-23 19:30:34 | delivered |

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The SGE **ARCo** provides a web-based tool that contains a set of predefined SQL queries. The predefined queries implement the most frequent statistical inquiries.

You can modify these queries or create your own. To create your queries, you can use either the **Simple Query builder** (suitable for SQL novices) or the **Advanced Query generator**

Some parameters in the Queries can be resolved at runtime **{ LATEBINDING }**

You can display the data in a tabular, graphical, or pivotal form. You can export the data in CVS or PDF form, or store the result for later viewing.

**ARCo** application is hosted inside the **The Java Web Console** container that provides a common location for users to access web-based system management applications. You access the web console by logging in through a secure **https** port with one of several supported web browsers. The single entry point that the web console provides eliminates the need to learn URLs for multiple applications. In addition, the single entry point provides **user authentication and authorization** for **all** applications that are registered with the web console.

All web console-based applications conform to **the same user interface guidelines**, which enhances ease of use. The web console also provides **auditing** of user sessions and **logging** service for all registered applications.

http://docs.huihoo.com/opensolaris/system-administration-guide-basic-administration/html/ch03s02.html

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How to install the **SUN Java Web Console** on Linux required by **ARCo**:

```
# unzip webconsole3.0.2-linux.targz.zip
 Archive:  webconsole3.0.2-linux.targz.zip
  inflating: sge6_2u5/webconsole3.0.2-linux.tar.gz
# cd sge6_2u5/
# tar -xzvf webconsole3.0.2-linux.tar.gz
SUNWjato-2.1.5.i386.rpm
SUNWjatodmo-2.1.5.i386.rpm
SUNWjatodoc-2.1.5.i386.rpm
SUNWmcon-3.0.2-5.i386.rpm
SUNWmconr-3.0.2-5.i386.rpm
SUNWmcos-3.0.2-5.i386.rpm
SUNWmcosx-3.0.2-5.i386.rpm
SUNWmctag-3.0.2-5.i386.rpm
config_properties.tpl
jdk-1_5_0_04-linux-i586.rpm
setup
sun-javahelp-2.0_01-fcs.i586.rpm
.pkgrc
.setup_default
#
```

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```
# ./setup
Preparing packages for installation...
jdk-1.5.0_04-fcs
Preparing packages for installation...
sun-javahelp-2.0-fcs
Linking JavaHelp to /usr/java/jdk1.5.0_04 ...
Preparing packages for installation...
SUNWjato-2.1.5-9
...

Installation complete.
Starting Sun Java(TM) Web Console Version 3.0.2 ...
The console is running.
```

```
# netstat -tpln |grep java
tcp        0      0 :::6789                     :::*                        LISTEN      7013/java
```

```
# wcadmin list -a
Deployed web applications (application name, context name, status):

   com.sun.grid.arco_6.2u5  reporting      [running]
   console                        ROOT      [running]
   console              com_sun_web_ui      [running]
   console                     console      [running]
   console                     manager      [running]
```

# SGE 6.2u5 Accounting and Reporting Console ( ARCo )

APPLICATIONS | VERSION | LOG OUT | HELP

User: arco Server: t3ce.psi.ch

SUN Grid Engine - ARCo

Cluster: p6444

## Overview

List all defined queries and results

Query List | Result List

### Queries (1 - 25 of 29)

Run | Edit | Delete | New Simple | New Advanced

| Name | Category | LastModified | Type |
|---|---|---|---|
| cumul_walltime_vs_job_walltime | statistics | Mon May 16 15:41:44 CEST 2011 | advanced |
| Failed_overlong_jobs_per_user | statistics | Mon May 16 16:04:54 CEST 2011 | advanced |
| Job_efficiency_per_user | statistics | Mon May 16 16:25:15 CEST 2011 | advanced |
| Job length histogram | statistics | Mon May 16 15:40:23 CEST 2011 | advanced |
| Queue Consumables | Resource Usage | Mon May 09 12:34:53 CEST 2011 | advanced |
| Wallclock time | Jobs | Mon May 09 12:34:53 CEST 2011 | simple |
| Average Job Turnaround Time | Job | Mon May 09 12:34:53 CEST 2011 | advanced |
| Average Job Wait Time | Job | Mon May 09 12:34:53 CEST 2011 | advanced |
| Job Log | Job | Mon May 09 12:34:53 CEST 2011 | simple |
| Number of completed, failed, total jobs for past 24 Hours | Job | Mon May 09 12:50:21 CEST 2011 | advanced |
| Number of Jobs completed | Job | Mon May 09 12:34:53 CEST 2011 | advanced |
| Number of Jobs Completed per AR | Job | Mon May 09 12:34:53 CEST 2011 | advanced |
| Host Load | Cluster | Mon May 09 12:34:53 CEST 2011 | advanced |
| Advance Reservation Attributes | Advance Reservation | Mon May 09 12:34:52 CEST 2011 | simple |
| Advance Reservation by User | Advance Reservation | Mon May 09 12:34:52 CEST 2011 | simple |
| Advance Reservation Log | Advance Reservation | Mon May 09 12:34:52 CEST 2011 | simple |
| Advance Reservation Time Usage | Advance Reservation | Mon May 09 12:34:52 CEST 2011 | advanced |
| DBWriter Performance | Administration | Mon May 09 12:34:53 CEST 2011 | advanced |
| Statistic History | Administration | Mon May 09 12:34:53 CEST 2011 | advanced |
| Statistics | Administration | Mon May 09 12:34:53 CEST 2011 | advanced |
| 1 day CPU User and System usage | Accounting | Mon May 09 14:12:40 CEST 2011 | advanced |
| 1 Month SUM CPU Time per day per user | Accounting | Wed May 11 08:02:57 CEST 2011 | advanced |
| 1 Month SUM Wall time and SUM CPU Time per User | Accounting | Mon May 16 18:40:56 CEST 2011 | advanced |
| 1 Month SUM Wall Time per User | Accounting | Tue May 10 14:51:43 CEST 2011 | advanced |
| Accounting per AR | Accounting | Mon May 09 12:34:52 CEST 2011 | advanced |

Run | Edit | Delete | New Simple | New Advanced | Page: 1 of 2 Go

PAUL SCHERRER INSTITUT

# SGE 6.2u5 Accounting and Reporting Console ( ARCo )

Cluster: p6444

Overview > Query Result

## 1 Month SUM Wall time and SUM CPU Time per User

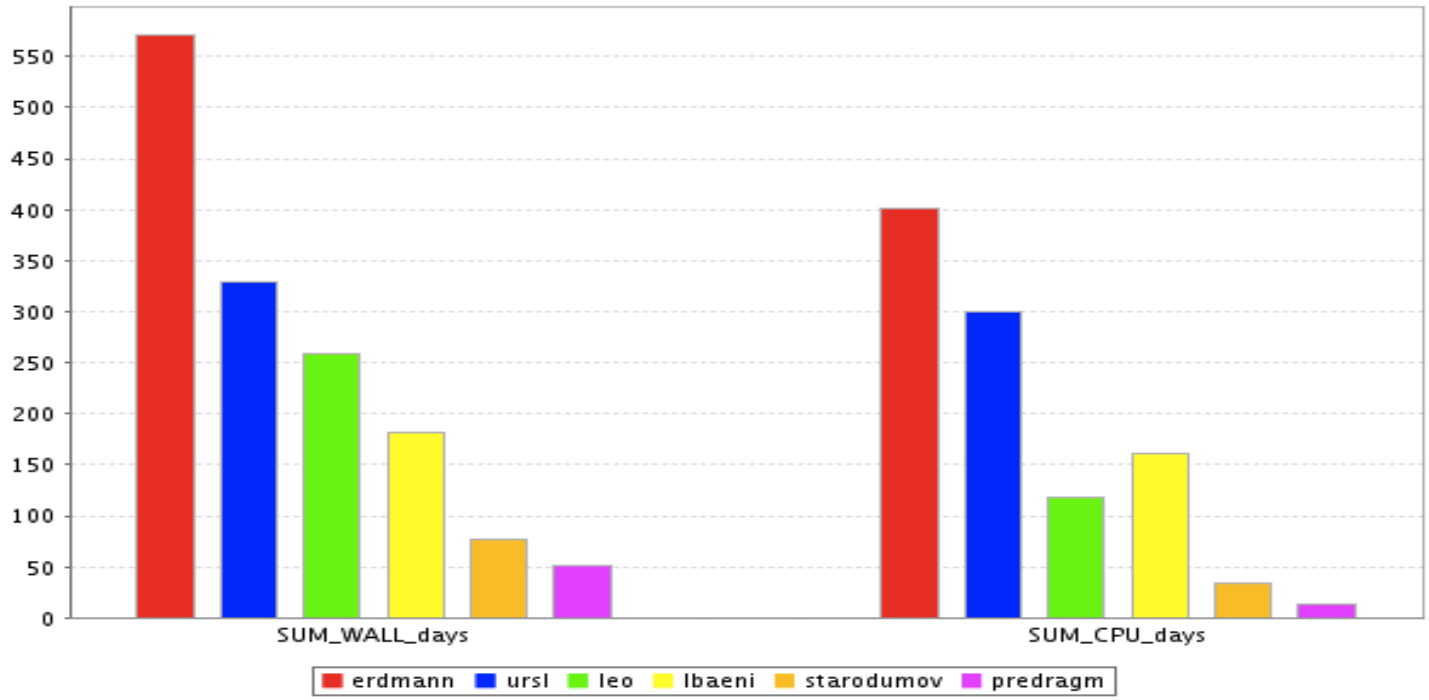
Edit | Save Result

Export As:

**Category:** Accounting

**Description:** 1 Month SUM Wall Time + SUM CPU Time per User

**Sql:** SELECT username AS "user", SUM(wallclock_time)/86400 AS SUM_WALL_days,SUM(cpu)/86400 AS SUM_CPU_days,(SUM(cpu)/86400)/(SUM(wallclock_time)/86400) FROM view_accounting WHERE start_time >= '2010-05-01' AND end_time <= '2010-05-31' GROUP BY username ORDER BY SUM_WALL_days DESC limit 6;




Edit | Save Result

# SGE 6.2u5 Accounting and Reporting Console ( ARCo )

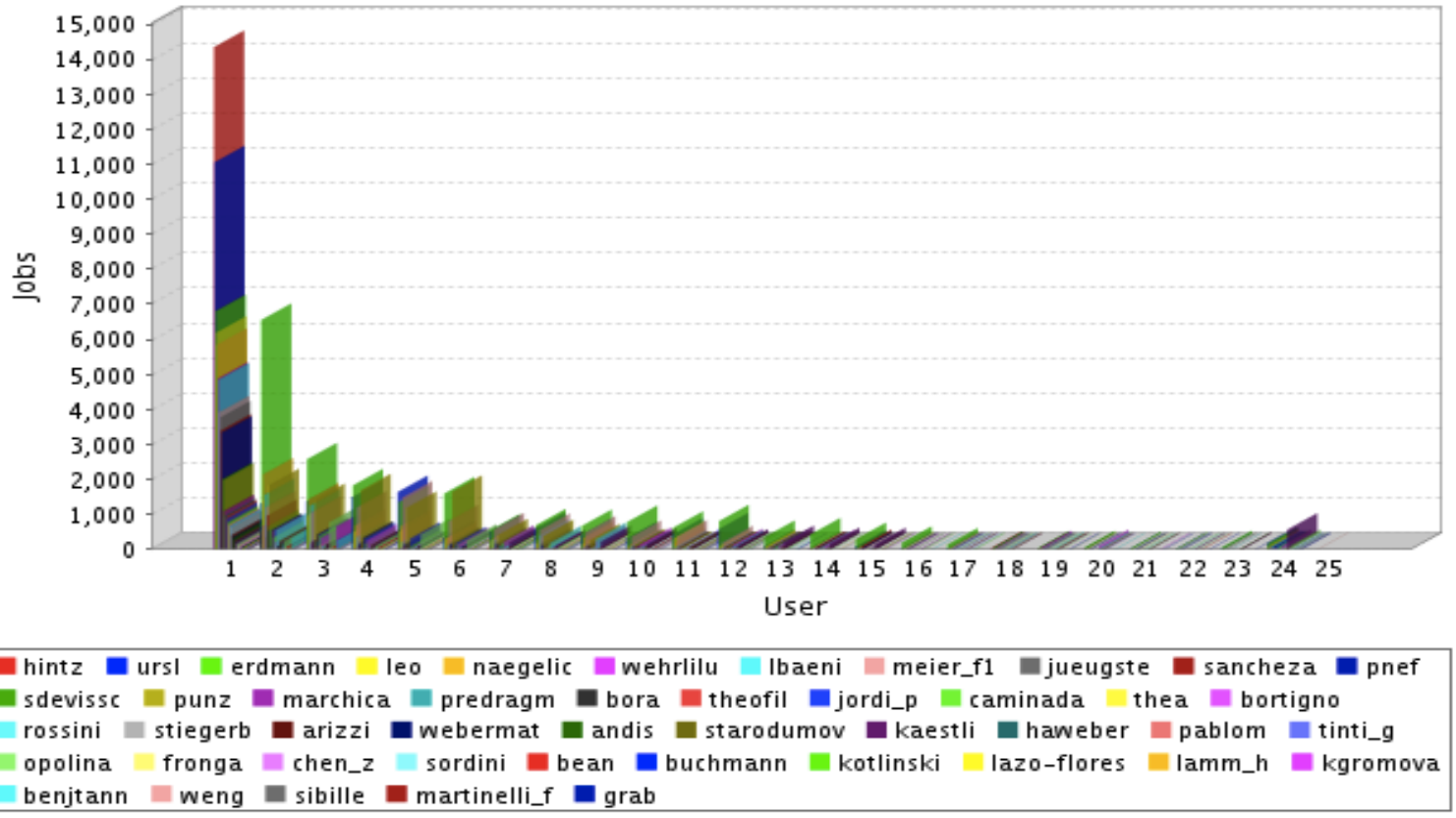
Overview > Query Result

## Jobs per hours per users

**Category:** Statistics

**Description:** Jobs per hours per users

**Sql:** SELECT s as Jobs_Length_inHours_since_01Jan2009, username as User, c as Jobs FROM view_lenghts_users_amount



# SGE 6.2u5 Accounting and Reporting Console ( ARCo )

Intro
SGE @ PSI T3
qacct vs DB
SGE dbwriter
DB CLI
DB phpMyAdmin
DB ARCo
**DB cron+arcorun**
Conclusions

## #$SGE_ROOT/$SGE_CELL/arco/reporting/**arcorun**

arcorun [-c <file>] [-d <debug level>]
[-l] [-help] [-?] [-v] [-o <output file>] [-n <result name>]
[-f <format>] (-lb name=value)* [-lbfile <file>] [-cl <cluster name>]
<query name> )

**-l** list all available query names
-help | -? print this help message
-v print version
-c <file> path to set configuration file of arco
(default: $SGE_ROOT/$SGE_CELL/arco/reporting/config.xml)
**-d <level>** debug level for arco run (FINE INFO WARNING)
**-o <output file>** path of the file where the result of the query will be stored
(default stout)
**-f <format>** format of the output (**xml|csv|pdf|html**). if the output format
is html the output file must be a directory.
(default xml)
-lb <name>=<value> specify the a late binding parameter for the query
-lbfile <file> where late binding parameters are specified
-n <result name> sets the name of the result, if this option is not specified
the result takes the name of the given query
-cl <cluster name> name of the cluster on which the query should be executed,
if this option is not specified the default cluster is used
**<query name>** name of the query which should be executed

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```
# $SGE_ROOT/$SGE_CELL/arco/reporting/arcorun -d FINE -f html -o
/var/www/html/sge_queries/May2010_SUM_CPU_per_day_per_user/ "1
Month SUM CPU Time per day per user"
 INFO: set debug level to FINE
 FINE: parameters list is ok
 FINE: toc file exists, parse it
 FINE: parse file /var/spool/arco/queries/toc.xml
 FINE: toc has 32 entries
 FINE: parse file
/var/spool/arco/queries/1_Month_CPU_Time_per_day_per_user.xml
 FINE: Got db:sge_arco connection id 9
 FINE: execute sql -------
 SELECT COUNT( * ) AS N_JOBS_STARTED ,
DATE_FORMAT( start_time, '%d' ) AS
 DAY_OF_THE_MONTH, username as USERNAME, SUM(cpu)/60 AS
SUM_CPU_mins FROM `view_accounting`
 WHERE `start_time` >= '2010-05-01 00:00:00'
 AND `end_time` <= '2010-05-31 23:59:59'
 GROUP BY
 DAY_OF_THE_MONTH, USERNAME
 ORDER BY DAY_OF_THE_MONTH
 --------
 CONFIG: query executed in 0.979s
 FINE: Connection db:sge_arco released id 9
 FINE: query executed in 0.988s
```

# SGE 6.2u5 Accounting and Reporting Console ( ARCo )

Intro
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**Conclusions**

- We consider the SGE ARCo module a key component to understand the PSI T3 usage during the last Days, Months and Years and to create Usage Reports.

- If well documented, its installation takes just 1h for the components + O(**reporting** file) to populate the DB. The online documentation is quite minimal but we can support you, simply let's try.

- It's a professional solution, free of charge until 6.2u5.

- By using **XML** files and **standard VIEWs** SGE Sites can **share** interesting queries based on the same metrics and create similar Reports.

- We didn't try, but it also supports **multi-cluster installation ( GRID accounting ? )**