Job Monitoring and User Portal
Webportals @ JSC

28.11.2019  |  SEBASTIAN LÜHRS
Usage model of JSC resources

Research Project 1
- **PID**: CPRJ42, **PI**: PI1
- **Budget**: PRJ42: 10000 core hours on JUWELS
- **Unix group**: CPRJ42
- **Dataspaces**: PROJECT 20TB, SCRATCH 90TB

**System name**: Multiple systems and partitions can be granted per project

**Budget name**: Necessary to submit jobs to the cluster

Data Project 1
- **PID**: D172, **PI**: PI3
- **Unix group**: D172
- **Dataspaces**: ARCH 400TB, DATA 20TB

**Account**: surname#
- **Grants**: JUDOOR access
- **Unix group**: juser
- **HOME**: 16GB (at least access to one project necessary)
- **SSH-Key** per system

Research Project 2
- **PID**: CPRJ97, **PI**: PI2
- **Budget**: PRJ97: 950 core hours on JURECA
- **Unix group**: CPRJ97
- **Dataspaces**: PROJECT 20TB, SCRATCH 90TB
## Compute project vs. data project

<table>
<thead>
<tr>
<th></th>
<th>Compute project</th>
<th>Data project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call</td>
<td>Twice per year</td>
<td>Continuously open</td>
</tr>
<tr>
<td>Computing time</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Grants system access</td>
<td>JUWELS / JURECA / JUDAC / …</td>
<td>JUDAC</td>
</tr>
<tr>
<td>Filesystem access on all systems</td>
<td>PROJECT / SCRATCH</td>
<td>ARCHIVE / FASTDATA / DATA / SOFTWARE</td>
</tr>
</tbody>
</table>
3 Steps to access the HPC systems
Step 1: JUDOOR account registration

JuDoor Login
Portal for managing accounts, projects and resources at JSC.

Login using JSC webservice account

Username:
Juehirs2

Password:

Login with e-mail callback

Login mail address:

A confirmation email to confirm your identity will be sent to this address.

Send Identification mail

If you are stuck take a look at the JuDoor Documentation.

https://judoor.fz-juelich.de
Step 2: Join a project

Two alternatives

**Join a project**

in JUDOOR if you know the project id

Follow invitation link send by PI or PA

https://judoor.fz-juelich.de/projects/join/...

PI/PA receives notification and grants project resource specific access
## JUDOOR Overview

A user can be part of multiple compute and data projects

<table>
<thead>
<tr>
<th>Compute project</th>
<th>Data project</th>
<th>Data project and PI/PA access</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSbenchmark</td>
<td>PRACE CoE Allocation EoCoE</td>
<td>Cross Sectional Team - Application Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HPCLAB - Schulungsprojekt</td>
</tr>
</tbody>
</table>
JUDOOOR Overview

Each project grants access to various systems and partitions.

<table>
<thead>
<tr>
<th>System</th>
<th>Manage SSH-keys</th>
<th>Usage agreement confirmed on 21.02.2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>deep</td>
<td></td>
<td></td>
</tr>
<tr>
<td>judac</td>
<td></td>
<td></td>
</tr>
<tr>
<td>jureca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>juron</td>
<td></td>
<td></td>
</tr>
<tr>
<td>juropa3exp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>juwels</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Usage agreement link** must be visited first before **Manage SSH-Keys** link appears.

**Projects connected to this resource**
JUDOOR Quota status

Active Budgets

Budget name to submit a job

Used

Available

Lost

Consumed before this month

Over Budget

Consumable budget of next month

Storage Quota

Storage on just

scratch

4.17/35.00 TB

920/1,900k inodes

01.06.19–31.05.20

project

0.29/1.00 TB

920/5,000k inodes

01.06.19–31.05.20
Step 3: Upload your SSH-key

Add SSH key to deep

Here you can upload an SSH public key to the system. Information on how to create an SSH public key can be found here. It might take up to 15 minutes until the newly added SSH key is activated.

- [ ] Remove all other existing public keys.

Your public key

```
ssh-rsa AAAAB3N...
```

Paste the content of your `.pub`-file here or upload a file below.

Save
Online information and documentation

JURECA: https://www.fz-juelich.de/ias/jsc/jureca
JUWELS: https://www.fz-juelich.de/ias/jsc/juwels
Overview preinstalled software

**JURECA**: https://apps.fz-juelich.de/jsc/llview/jureca_modules/

**JURECA BOOSTER**: https://apps.fz-juelich.de/jsc/llview/jureca_modules_booster/

**JUWELS**: https://apps.fz-juelich.de/jsc/llview/juwels_modules/
Overview preinstalled software

One software toolchain: Intel compiler & ParaStationMPI

Can be loaded on the system by using:
module load Intel
module load ParaStationMPI
module load netCDF

Software toolchains
System news

- Welcome to JUWELS
  - Julich Wizard for European Leadership Science

### Known Issues ###
An up-to-date list of known issues on the system is maintained at https://apps.fz-juelich.de/jsc/jsc/juwels-known-issues.html

### Support ###
1. See http://fz-juelich.de/ian/jsc/juwels-user-info or read "man juwels" to get used to the system.
2. Please write an email to elof@fz-juelich.de if you need further assistance.

### Updated InfiniBand network drivers ###
The InfiniBand issues that affected JUWELS have been solved after the last maintenance. All jobs now run using the same setup. The reactivity of large jobs has been improved significantly. The default MPI settings are unchanged for the moment. If you want to minimize the memory footprint of the MPI runtime at large scales, please contact elof@fz-juelich.de.

### Maintenance ###
The next maintenance for hardware and software updates are planned for the following days:
- Thursday, 2019-11-28, 08:00 - 18:00
- Monday and Tuesday, from 2019-11-25, 08:00 to 2019-11-26, 19:00

Beach and login systems will not be available.

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Getting High Messages via E-Mail, please subscribe with the help of mailman

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https://dispatch.fz-juelich.de:8812/HIGHMESSAGES

https://lists.fz-juelich.de/mailman/listinfo/highmessages
Job monitoring & reports

JURECA: https://llview.fz-juelich.de/LLweb/jureca/jobreport/login.php

JUWELS: https://llview.fz-juelich.de/LLweb/juwels/jobreport/login.php

Logindata: JUDOOR username & password
Job monitoring

*Job reports on JUWELS - User view*

- **Scheduler overview**
- **Job overviews**
- **Load & memory consumption**
- **Network traffic**
- **Total I/O traffic**
- **Job report**

**Table**

<table>
<thead>
<tr>
<th>ended</th>
<th>jobid</th>
<th>owner</th>
<th>project</th>
<th>queue</th>
<th>starttime</th>
<th>enl_endtime</th>
<th>runtime</th>
<th>#nds</th>
<th>Load/Nd</th>
<th>Mem/Nd</th>
<th>IC Mib/Nd</th>
<th>IC Pck/Nd</th>
<th>HomeWr</th>
<th>HomeRd</th>
<th>PjWr</th>
<th>PjRd</th>
<th>ScWr</th>
<th>ScRd</th>
<th>FDataWr</th>
<th>FDataRd</th>
<th>#spis</th>
</tr>
</thead>
<tbody>
<tr>
<td>5d22h12m</td>
<td>1834024</td>
<td>luehrs2</td>
<td>ctao</td>
<td>batch</td>
<td>2019-11-12 06:17</td>
<td>2019-11-12 06:38</td>
<td>6m</td>
<td>683</td>
<td>22.16</td>
<td>75.23</td>
<td>2601.98</td>
<td>2.97</td>
<td>0.00</td>
<td>1319.59</td>
<td>8.0</td>
<td>6 PDF</td>
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<td>6d14h17m</td>
<td>1824050</td>
<td>luehrs2</td>
<td>ctao</td>
<td>batch</td>
<td>2019-11-11 14:15</td>
<td>2019-11-11 14:35</td>
<td>3m</td>
<td>683</td>
<td>24.43</td>
<td>30.48</td>
<td>5809.63</td>
<td>6.48</td>
<td>193.27</td>
<td>4035.78</td>
<td>3 PDF</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10d15h39m</td>
<td>1824058</td>
<td>luehrs2</td>
<td>ctao</td>
<td>batch</td>
<td>2019-11-08 09:12</td>
<td>2019-11-08 09:32</td>
<td>4m</td>
<td>683</td>
<td>0.65</td>
<td>31.08</td>
<td>567.82</td>
<td>0.35</td>
<td>0.14</td>
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<td>4 PDF</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>10d19h27m</td>
<td>1824057</td>
<td>luehrs2</td>
<td>ctao</td>
<td>batch</td>
<td>2019-11-07 08:35</td>
<td>2019-11-07 09:15</td>
<td>13m</td>
<td>683</td>
<td>25.69</td>
<td>71.82</td>
<td>16.23</td>
<td>0.01</td>
<td>0.01</td>
<td>16337.11</td>
<td>13 PDF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Graphs**

- **Load & memory consumption**
- **Network traffic**
- **I/O traffic**
Job monitoring

- Based on the LLview platform and architecture
- Non-intrusive monitoring of memory, load, interconnect, I/O, GPU
  - No job overhead
  - Automatically available, to additional instrumentation needed
- Available for all users on JURECA and JUWELS
- Job-reports and continuous job monitoring (two weeks job coverage)
### Job reports

#### Job Information
- **Jobid:** 1824057
- **User:** iuehrs2
- **Project:** csao
- **Date/Time of job data:** 19/11/07-09:08:02

**Job runtime:** 13m

- Job start time: 19/11/07-08:55:31
- Job last timestamp: 19/11/07-09:08:03 (running)
- Job end time (est.): 19/11/07-09:15:39

**Queue:** batch

**Job Size, #nodes:** 683

#### Job Performance metrics

<table>
<thead>
<tr>
<th>Metric</th>
<th>min</th>
<th>avg</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load (CPU-Nodes)</td>
<td>0.00</td>
<td>25.69</td>
<td>47.82</td>
</tr>
<tr>
<td>Memory (CPU-Nodes)</td>
<td>7277.40</td>
<td>34323.81</td>
<td>73548.40</td>
</tr>
<tr>
<td>Interconnect Traffic (in)</td>
<td>16.09</td>
<td>173.45</td>
<td>1109</td>
</tr>
<tr>
<td>Interconnect Traffic (out)</td>
<td>0.13</td>
<td>1.01</td>
<td>4235</td>
</tr>
<tr>
<td>Interconnect Packets (in)</td>
<td>44546</td>
<td>10894</td>
<td>1109</td>
</tr>
<tr>
<td>Interconnect Packets (out)</td>
<td>1109</td>
<td>10894</td>
<td>44546</td>
</tr>
</tbody>
</table>

#### Job I/O statistics

- **$HOME:**
  - Total Data Write: 0.00 MB
  - Total Data Read: 0.00 MB
  - max. Data rate/Node Write: 0.00 MB/s
  - max. Data rate/Node Read: 14.43 MB/s
  - Open-Close Rate/Node: 14.37 ops/s

- **$PROJECT:**
  - Total Data Write: 0.00 MB
  - Total Data Read: 0.00 MB
  - max. Data rate/Node Write: 0.00 MB/s
  - max. Data rate/Node Read: 14.37 MB/s
  - Open-Close Rate/Node: 14.37 ops/s

- **$SCRATCH:**
  - Total Data Write: 13.78 MB
  - Total Data Read: 16729204.17 MB
  - max. Data rate/Node Write: 0.06 MB/s
  - max. Data rate/Node Read: 50371.49 MB/s
  - Open-Close Rate/Node: 2668.85 ops/s

- **$FASTDATA:**
  - Total Data Write: 0.00 MB
  - Total Data Read: 0.00 MB
  - max. Data rate/Node Write: 0.00 MB/s
  - max. Data rate/Node Read: 14.37 MB/s
  - Open-Close Rate/Node: 14.37 ops/s

#### Job Usage Overview

![Graph showing CPU Load per Node over time]

- **avg CPU Load/Node:**
Job reports – Load & memory

CPU Nodes: Load

CPU Nodes: Memory
Job reports – Network traffic

Interconnect: Data Input / Node

Interconnect: Data Output / Node

Interconnect: Packet Input / Node

Interconnect: Packet Output / Node
Job reports – I/O traffic

File system $SCRATCH$: Write

File system $SCRATCH$: Open/Close Operations

File system $SCRATCH$: Read
Scheduler overview

Job reports on JUWELS - User view

Total network traffic
Avg. load & max. memory consumption