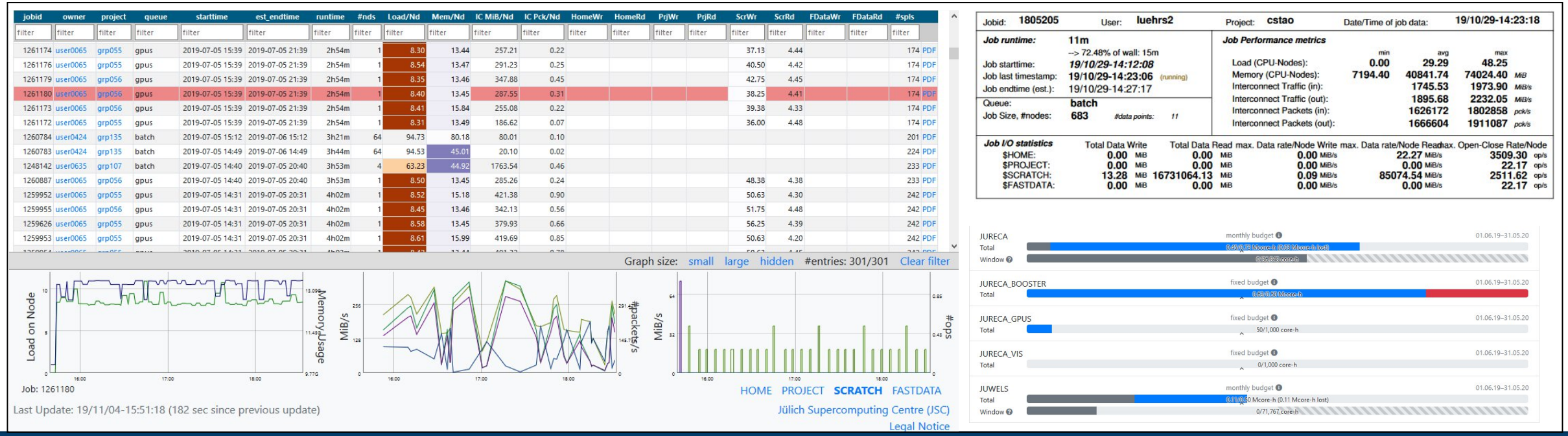


JSC Usage Models and Tools

Compute time allocations, User Portal, resource utilisation & job monitoring

12.05.2025 I Dr. Jolanta Zjupa

Getting access to JSC resources

	Test project	Compute project	Data project
Apply	anytime	twice a year: mid Feb/Aug *next deadline:* **11 August 2025, 17:00 CEST**	anytime
Compute time	fixed small contingent	demand based [Mcore-h]	none
Duration	4/6 months	1 year	1 year
Systems	JUWELS, JURECA, JUSUF, **JUDAC**	JUWELS, JURECA, JUSUF, JUPITER, **JUDAC**	**JUDAC**
Filesystems	PROJECT, SCRATCH	PROJECT, SCRATCH	DATA, LARGEDATA, ARCHIVE, OBJECTSTORE, ...

- https://www.fz-juelich.de/en/ias/jsc/systems/supercomputers/call-for-applications-for-test-projects-with-jsc-supercomputing-and-support-resources
- https://www.fz-juelich.de/en/ias/jsc/systems/supercomputers/apply-for-computing-time
- https://www.fz-juelich.de/en/ias/jsc/systems/supercomputers/call-for-proposals
- https://www.fz-juelich.de/en/ias/jsc/services/data-services/data-projects

Community specific access to JSC systems

- **Earth System Modelling** (ESM) (call based)

https://www.fz-juelich.de/en/ias/jsc/systems/supercomputers/apply-for-computing-time/esm

Rolling calls

- **AI** - HAICORE

https://www.helmholtz.ai/you-helmholtz-ai/computing-resources/

- **Neuroscience** - EBRAINS

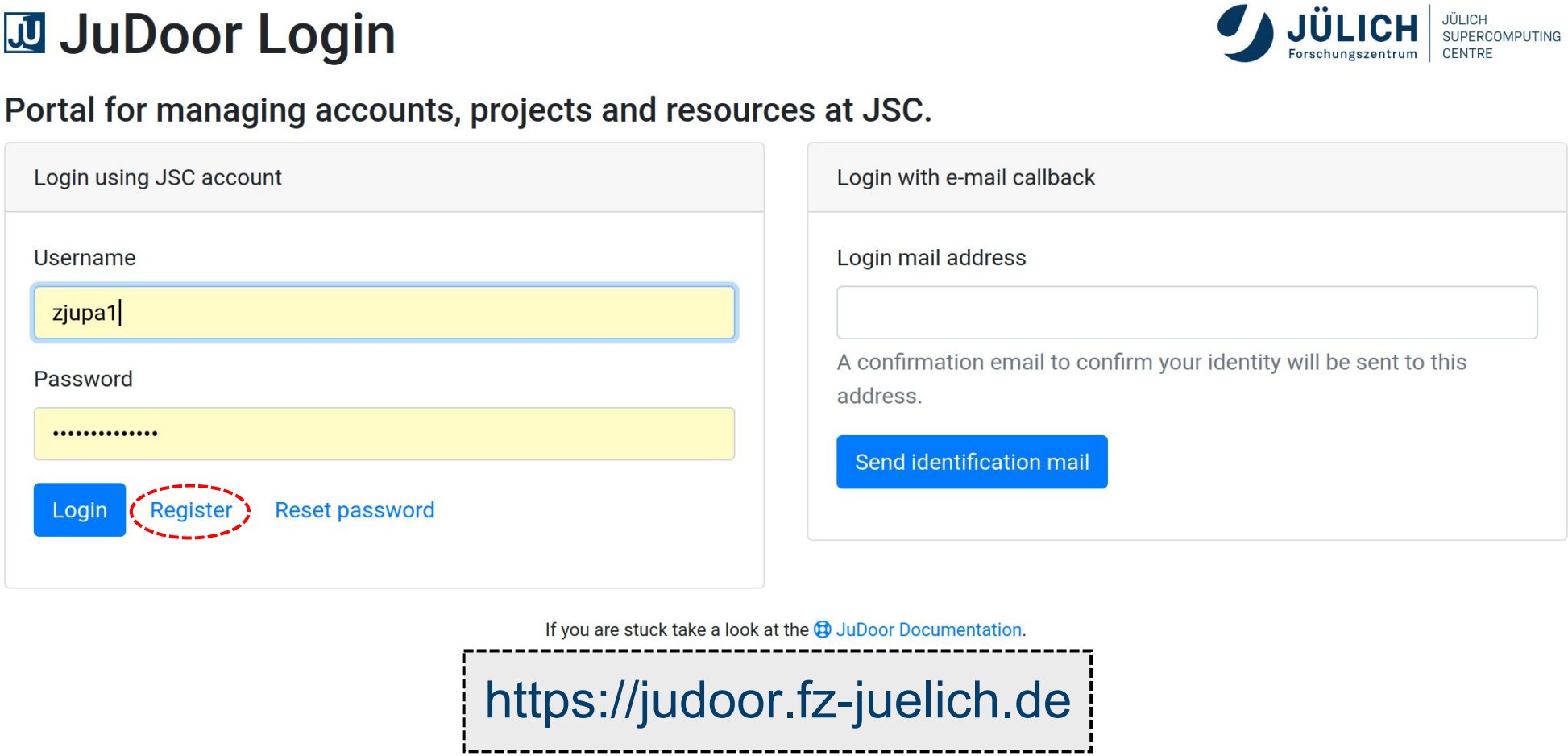
https://wiki.ebrains.eu/bin/view/Collabs/hpc-resources/

- **Astrophysics** - PUNCH ASTRO

https://results.punch4nfdi.de/?md=/docs/Compute/Computer_Resources/compute-projects.md

3 Steps to access the HPC systems

Step 1: JuDoor account registration



https://judoor.fz-juelich.de

Step 2: Join a project

Two alternatives

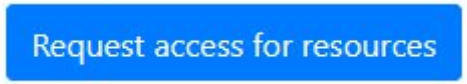
in **JuDoor** if you know the project ID

Follow invitation link send by PI or PA

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

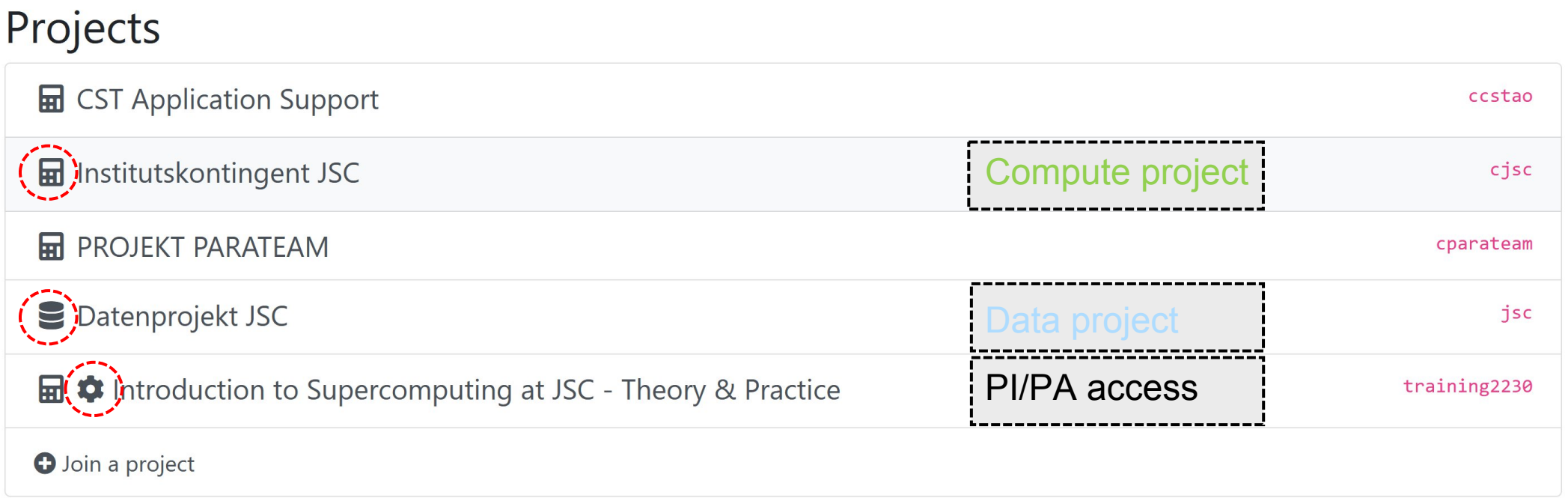
PI/PA receives notification and grants project resource specific access

If you are already a project member but do *not* see all available project resources, you can use



JuDoor

Project list overview



A user can be part of multiple compute and data projects

JuDoor

PI/PA

- receives notification
- manages project members
- grants access to specific resources
- manages data inheritance (PI only)
- has access to all project info on LLview and Kontview

PM

- project specific permanent contact point at JSC
- either from a SDL or ATML

https://www.fz-juelich.de/en/ias/jsc/services/user-support/project-mentoring

Project training2230

Project title	Introduction to Supercomputing at JSC - Theory & Practice
Type	Computeproject
Principal Investigator	Ilya Zhukov
Project Admin	Dr. Jolanta Zjupa
Project Mentor	Ilya Zhukov
Start date	01.11.2022
End date	30.11.2022
Community	Training
Address	Forschungszentrum Jülich GmbH Wilhelm-Johnen-Straße 52428 Jülich Germany
Group name	`training2230`

Data access is possible up to 3 month after the end of the project via JUDAC.

Active Budgets

Budget `cstao`

JuDoor

Each projects grants access to various systems and partitions.

Service status

Service Status | Legal notice | Privacy Policy | ✉ Mail Subscriptions

JSC Service Status

- Cluster Systems

JUWELS Cluster	JUWELS Booster
JURECA DC	JUSUF HPC
JUDAC	QLM
JUZEA1	HDF-ML
DEEP	

- File Systems

$HOME	$PROJECT	
$SCRATCH	$ARCHIVE	Next Maintenance at Jun 17, 2024, 08:00
$FASTDATA	$DATA	
$CSCRATCH		

- Services

JuDoor	Jupyter-JSC	
JSC Cloud	Backup	
Job reporting	UNICORE	Next Maintenance at Jun 10, 2024, 09:00
HDF Cloud	Cloud Object Storage	
JUSTCOM		

- Support

SC Support

JUWELS

Jülich Wizard for European Leadership Science

Federal Ministry of Education and Research

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Status

Please see the JSC Service Status Page for system status information:

System messages JUWELS Cluster

System messages JUWELS Booster

Supercomputers

- JUWELS
  - User Documentation
  - Configuration
  - FAQ
  - Known Issues
  - Job Reporting
  - Modules overview
  - Related Organisations
- JURECA
- JUSUF
- Apply for test access
- Apply for computing time

https://status.jsc.fz-juelich.de/

Read the MOTD

Service status

JUWELS Cluster

The Cluster partition of the JUWELS Supercomputer

JUWELS Cluster is currently degraded

Unavailable login nodes
- juwelsvis01.fz-juelich.de

Degraded base services

$CSCRATCH

Current state

Issues in cell 03

28. Feb. 2022, 14:20:00 - unknown

Today, on Monday 2022-02-28, at 14:20, a series of hardware failures resulted in a malfunction in the power and cooling systems of cell 03 in JUWELS Cluster. As a result the InfiniBand network suffered instabilities that affected other cells, and some jobs failed. The cell is now disconnected from the fabric and the system is stable.

We apologize for the inconvenience.

History

New software stage

10. Feb. 2022, 12:00:00 - 7. März 2022, 20:14:16

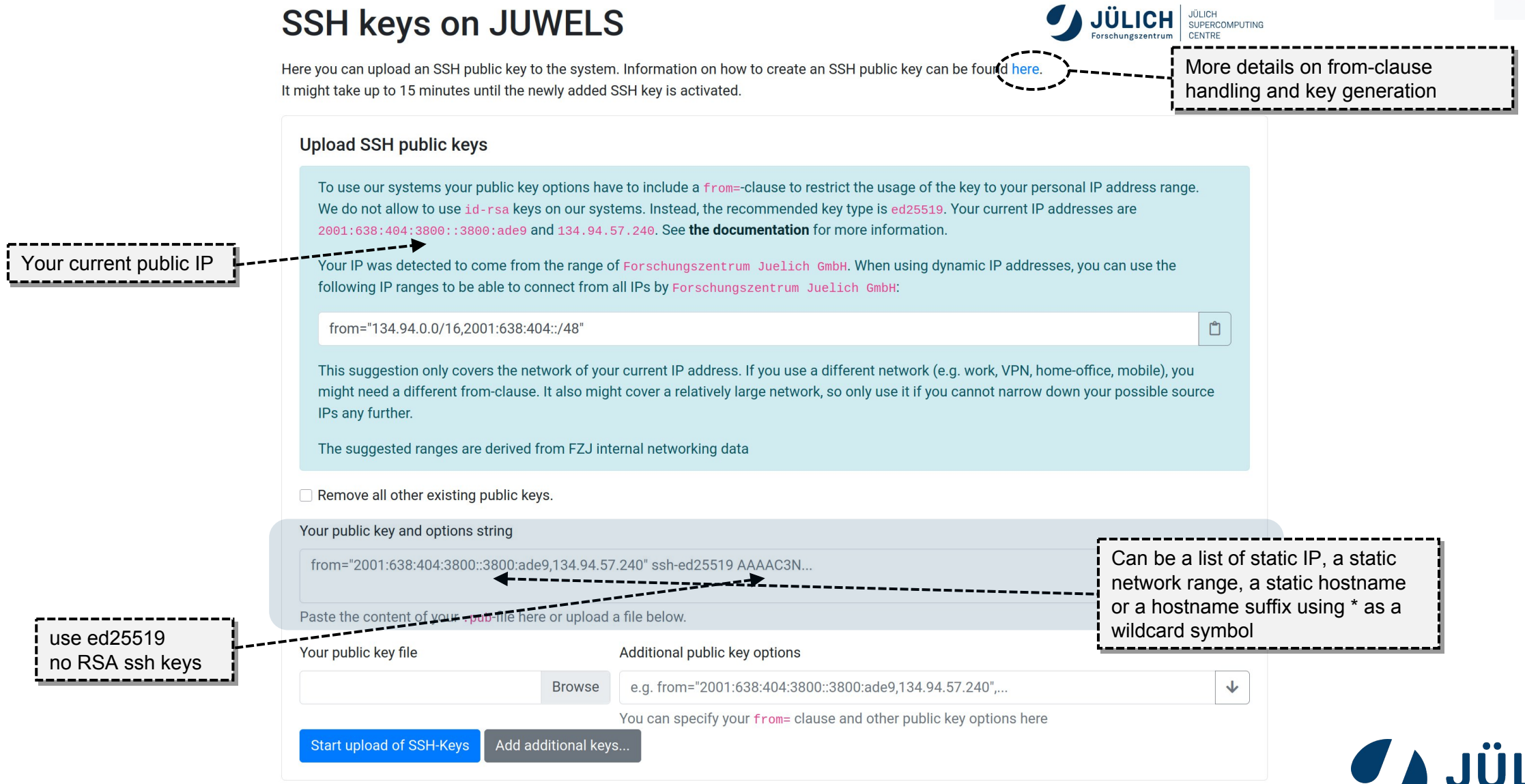
The default software stage has been changed to Stages/2022. If you wish to continue using the previous default stack please load Stages/2020 before any other module. Note that this stage will be deprecated.

JuDoor

Each projects grants access to various systems and partitions.

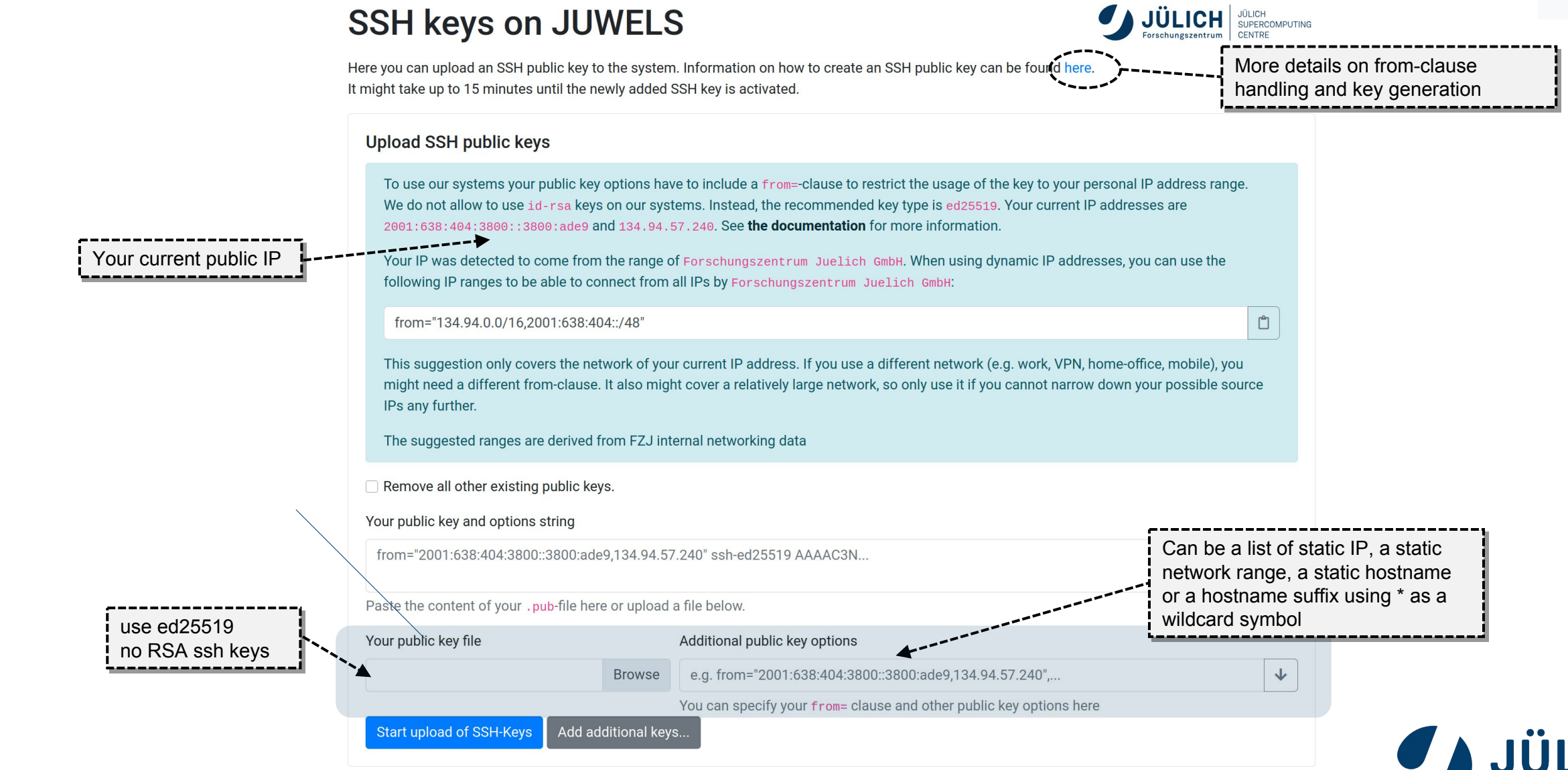
Step 3: Upload your SSH-key

MFA



Step 3: Upload your SSH-key

MFA



Further steps to get you going

Log in to JSC system of choice, over terminal:

```
ssh [-X] <username>@<system>.fz-juelich.de
```

alternatively you can use **JupyterLab**, favourite editor (upon set up of ssh connection), mount point (sshfs)

Talk tomorrow by J.-H. Göbbert (JSC)

- This will bring you to $HOME on **`<system>`** (there is a separate home on each JSC system)

Note: $HOME has only ~22.5 GB and is *not* meant for production - go to: $PROJECT or $SCRATCH

Note: $SCRATCH has **no backup** and files that have not been touched 90 days are **automatically deleted**

Documentation
& overview preinstalled software

JUWELS

Jülich Wizard for European Leadership Science

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Supercomputers

- JUWELS
  - User Documentation
  - Configuration
  - FAQ
  - Known Issues
  - Job Reporting
  - Modules overview
  - Related Organisations
  - JURECA
  - JUSUF
  - Apply for test access
  - Apply for computing time

Talk tomorrow by R. Partzsch (JSC)

Supercomputers: https://www.fz-juelich.de/en/ias/jsc/systems/supercomputers(/<system>)

Storage systems: https://www.fz-juelich.de/en/ias/jsc/systems/storage-systems(/<system>)

Further steps to get you going

Log in to JSC system of choice, over terminal:

```
ssh [-X] <username>@<system>.fz-juelich.de
```

- This will bring you to the **Login node**:
  - **shared resource**
  - time spend on Log in node is *not* deducted from the budget
  - number of parallel processes limited to 20
  - *not* meant for production but for setup, compilation, and submission to:
- **Compute node**:
  - **exclusive resource**, no node sharing
  - submit jobs using (PS)Slurm or get an interactive session
  - all time a compute node is allocated for you is deducted from your budget also if no computations are performed*!*

Talk tomorrow by C. Paschoulas (JSC)

Quota calculation

core-h =

#nodes x #physical_cores_per_node x runtime

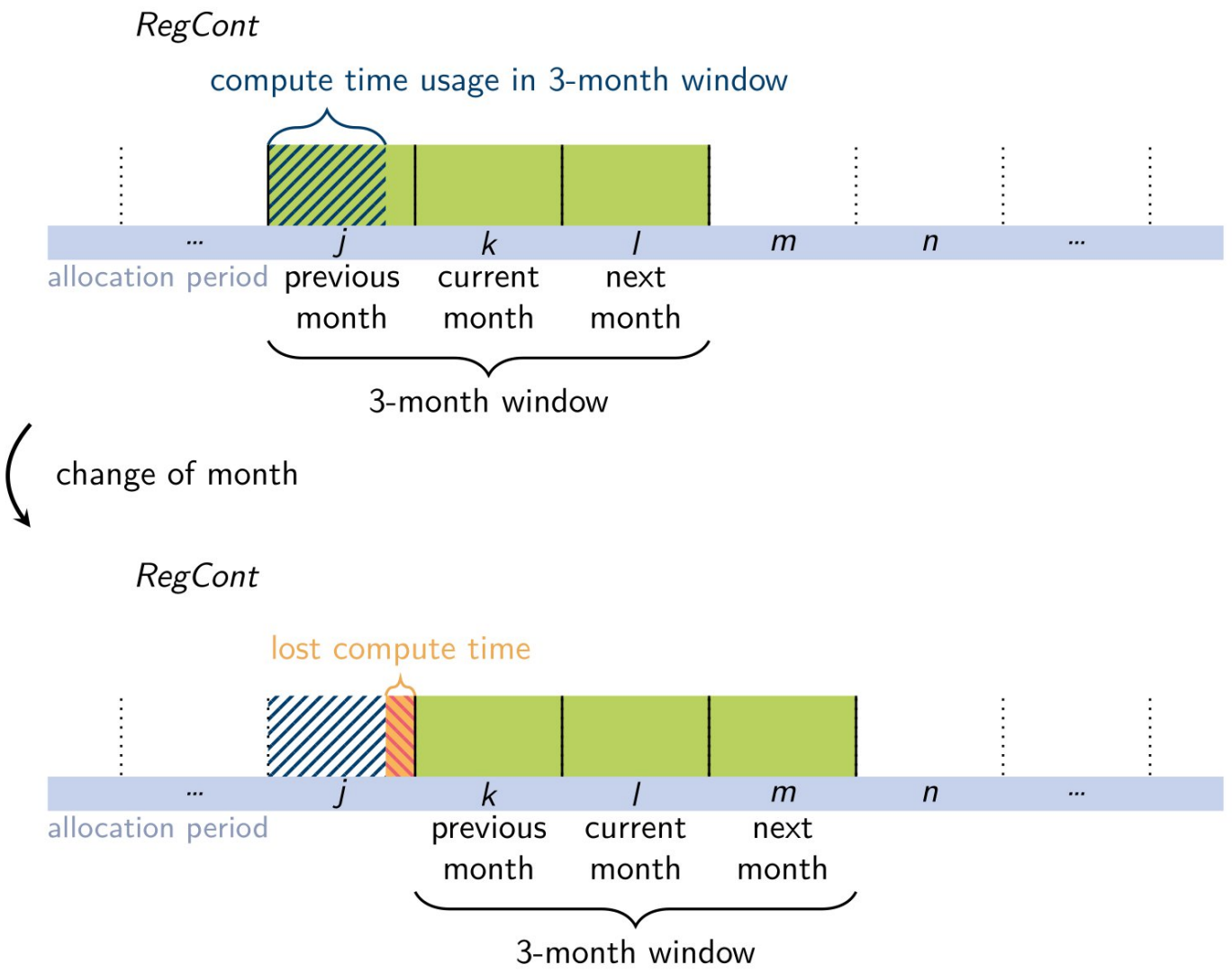
- **#physical_cores_per_node**:
  - JUWELS or JUWELS_BOOSTER: 48, JURECA-DC or JUSUF: 128
  - There is ***no node sharing on compute nodes***
  - **GPU**s are accounted for through core-h

- **runtime**: actual job runtime, not the provided walltime of the job

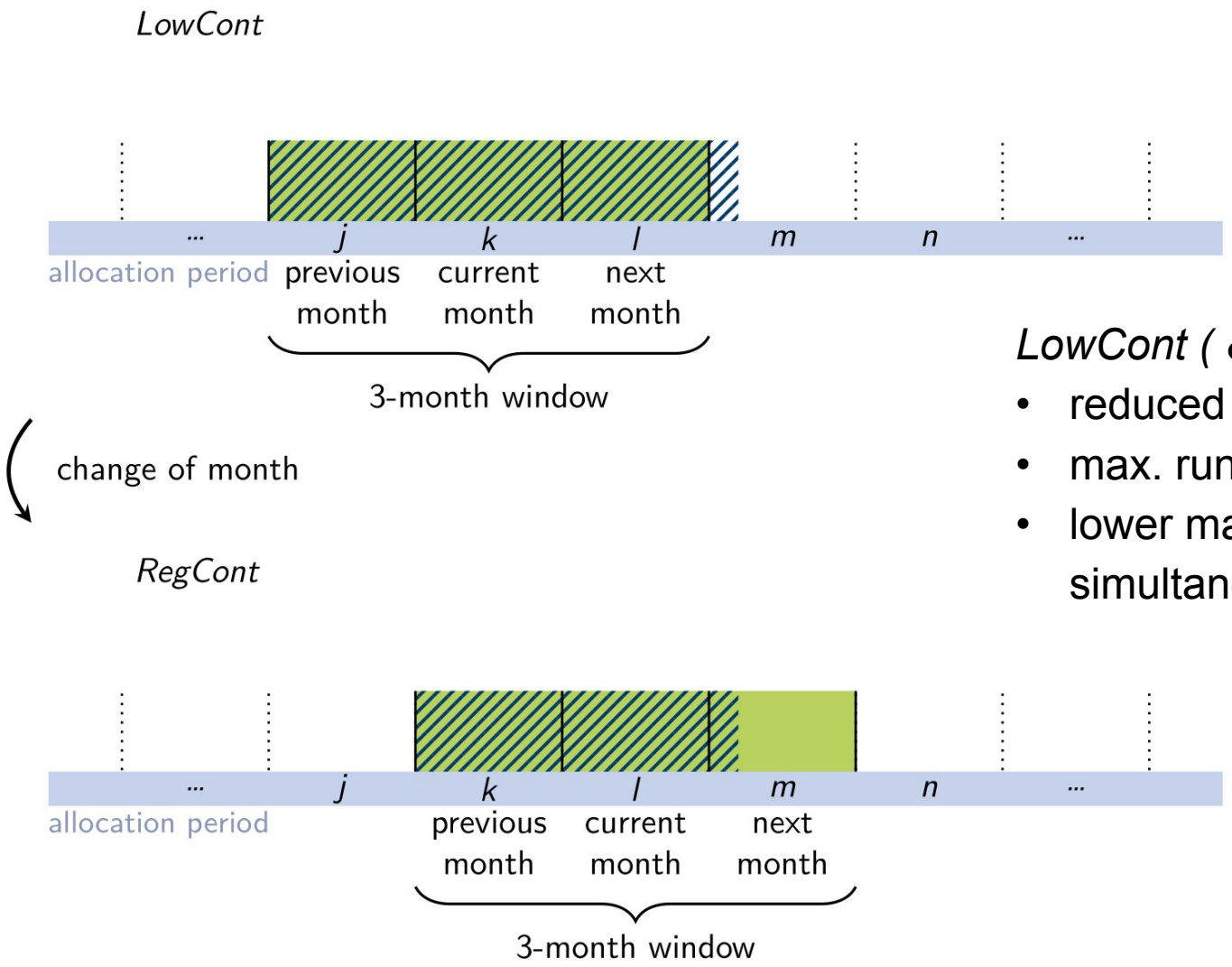
- The quota is fully placed on the day when the job ended
- The quota of a job is not taken into account in advance
- The base priority of a job based on the overall project quota and is updated on a daily basis

Each compute project has a budget that is shared among all group members. There are no user quotas.

3-month window compute budget regulations



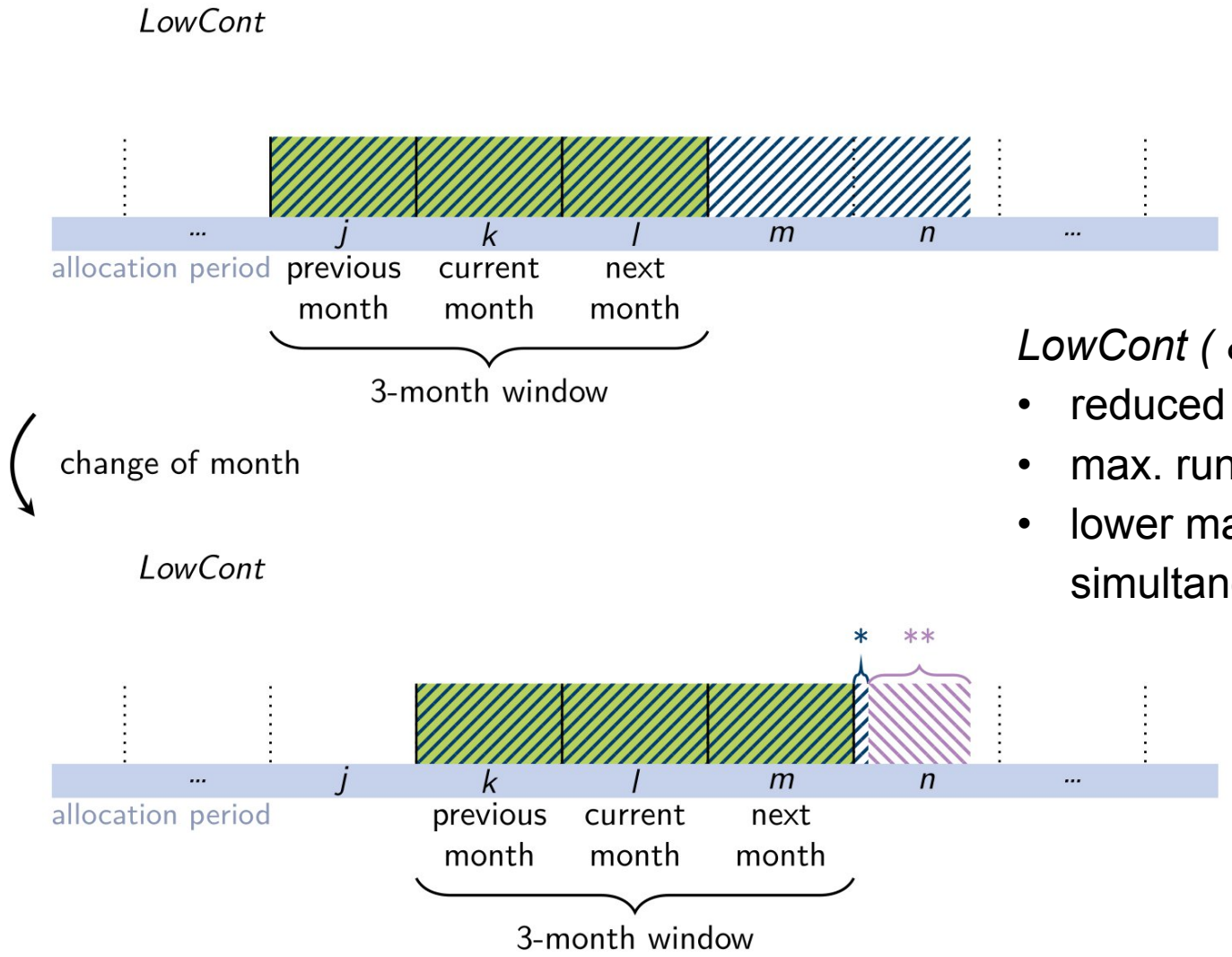
3-month window compute budget regulations



LowCont (& NoCont)

- reduced priority
- max. runtime = 6h
- lower max. number of simultaneously running jobs

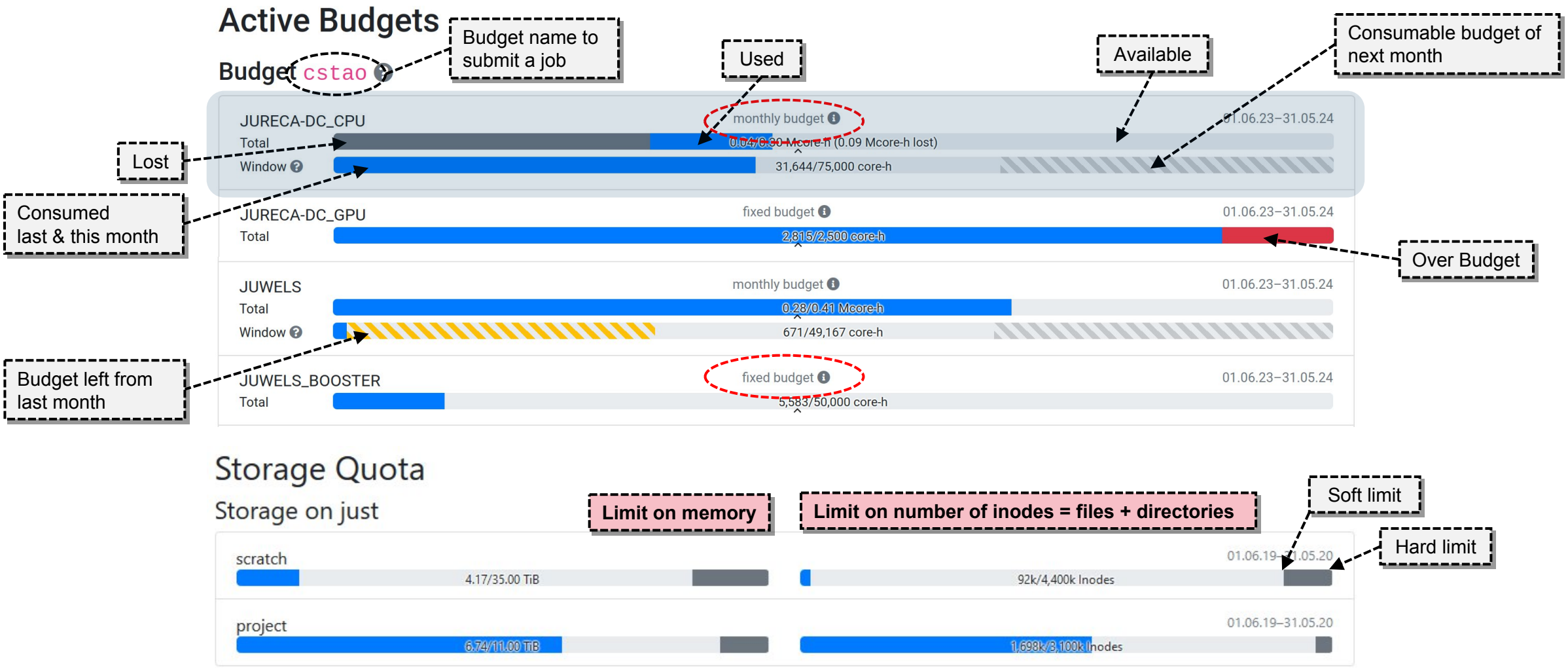
3-month window compute budget regulations



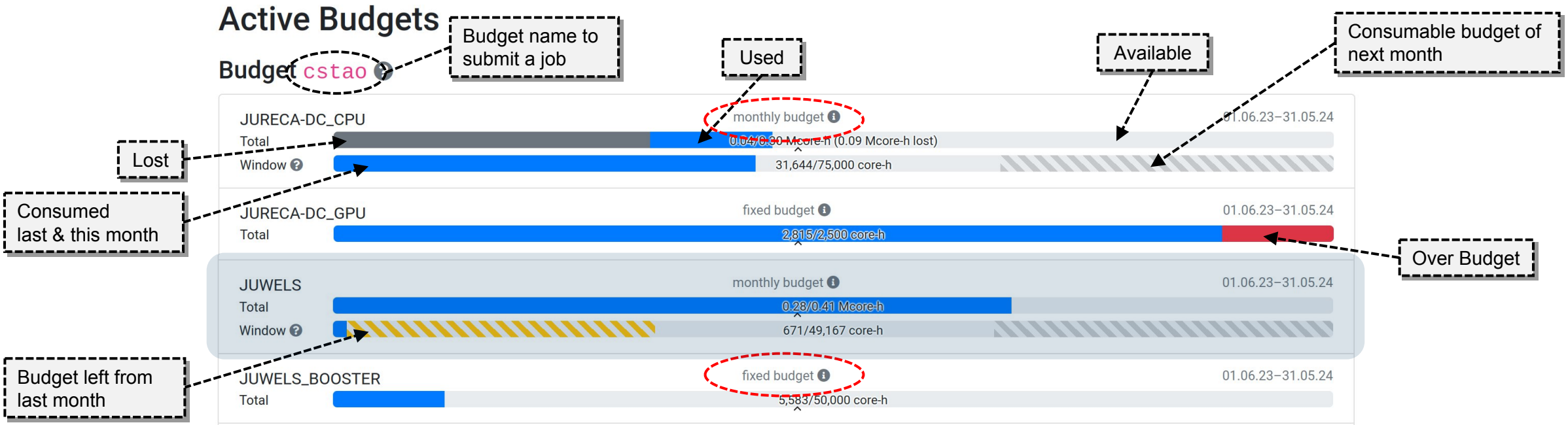
LowCont (& NoCont)

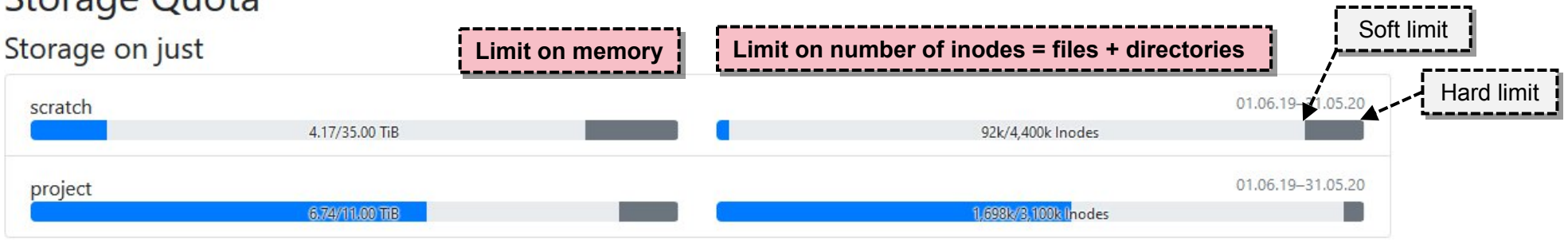
- reduced priority
- max. runtime = 6h
- lower max. number of simultaneously running jobs

JuDoor quota status



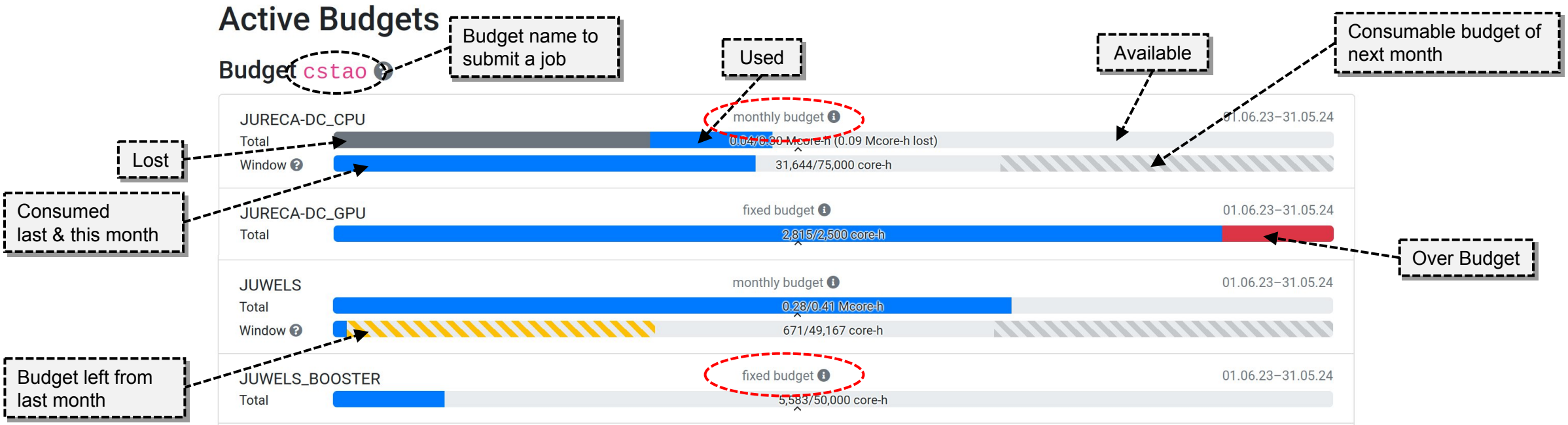
JuDoor quota status

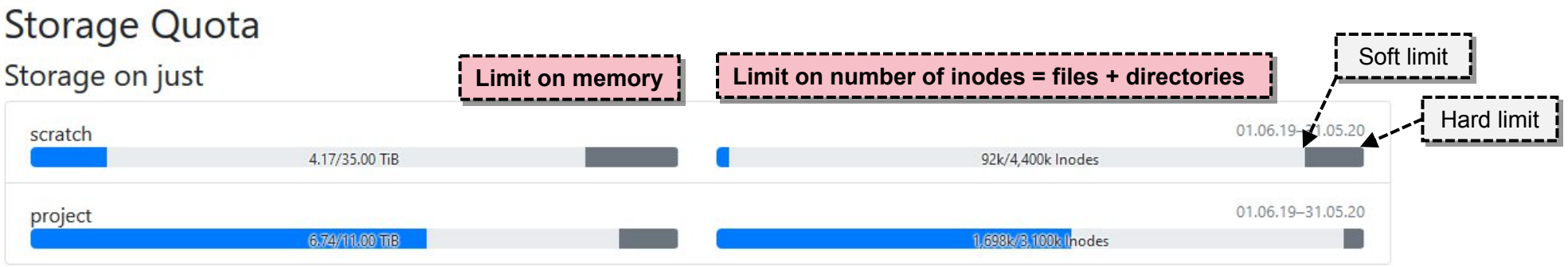




JuDoor quota status

JuDoor quota status





`jutil` tool & budget monitoring

- The budget can be monitored using the command line tool **`jutil`** in the terminal
- **`jutil`** can also be used to activate a specific budget by default for a running shell:

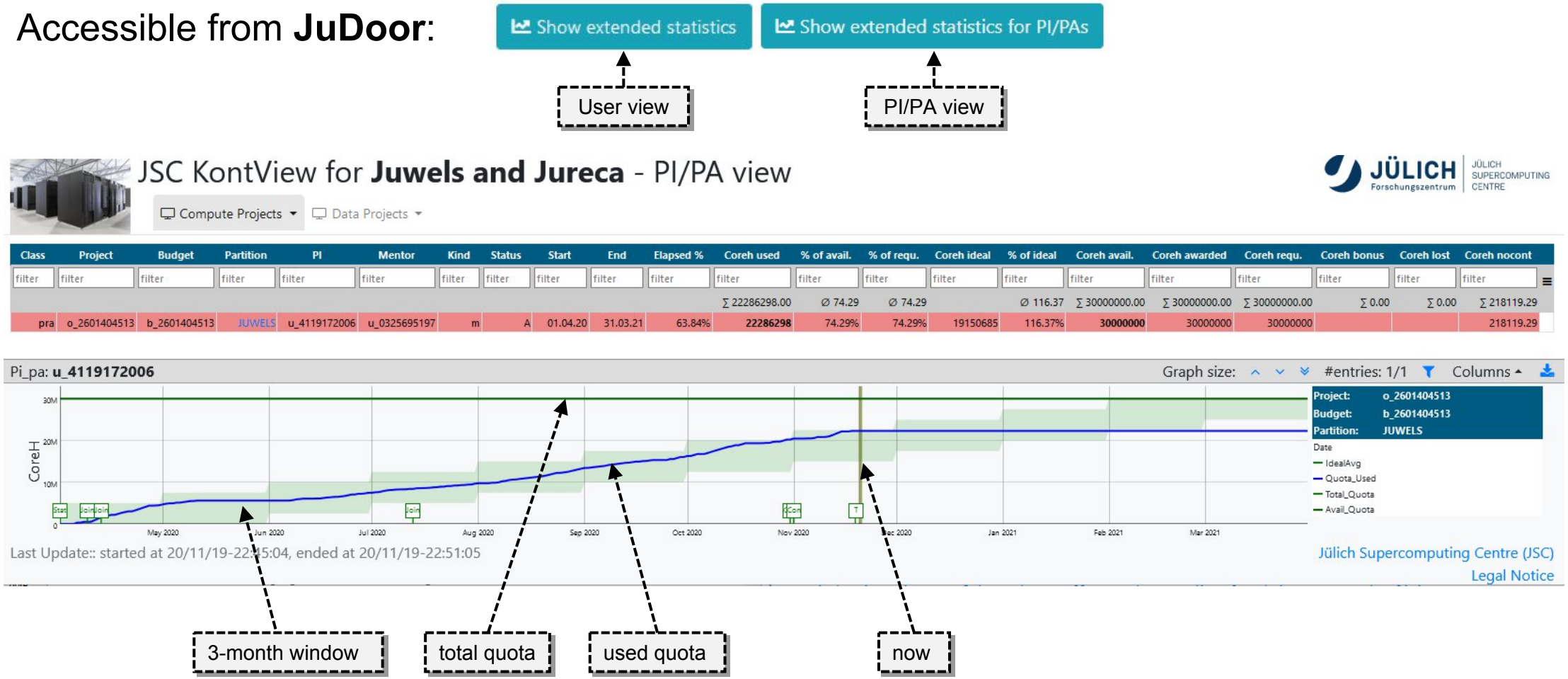
https://apps.fz-juelich.de/jsc/hps/just/jutil.html

```
# See your projects
jutil user projects

# See your compute allocation
jutil user cpuquota

# See your disk quota
jutil user dataquota

# Activate environment (and optionally default budget) for a given project
# Sets $PROJECT and $SCRATCH
jutil env activate -p <project> [-A <budget>]
```

complementary to providing the budget on a per job basis (using the `--account` or `-A` option in the batch script)

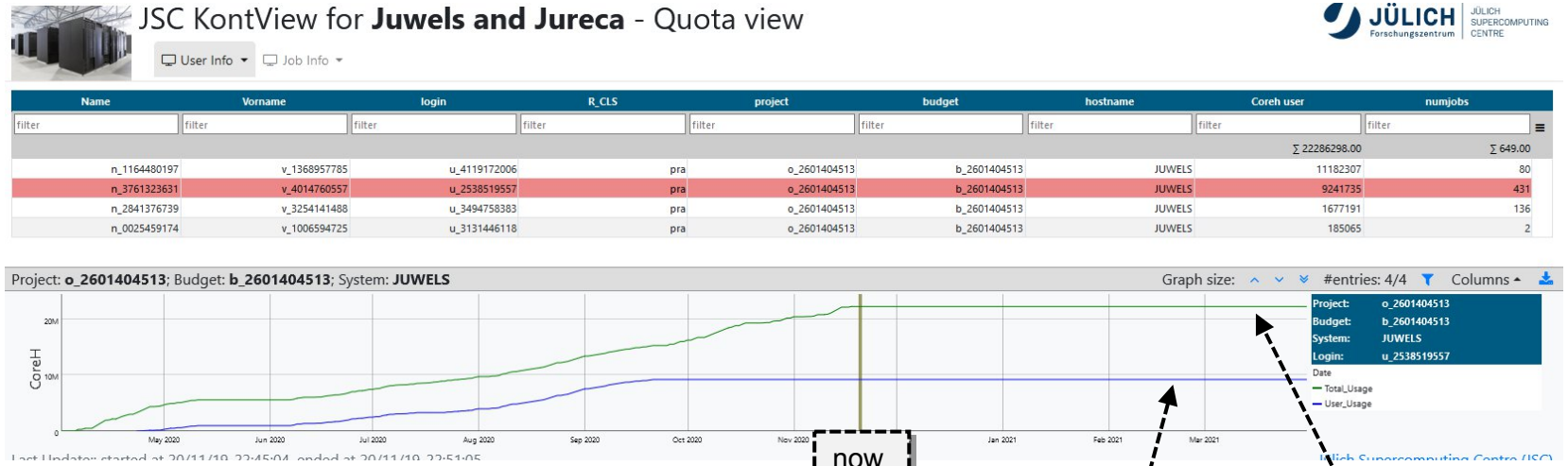
Project quota overview: KontView

Accessible from **JuDoor**:

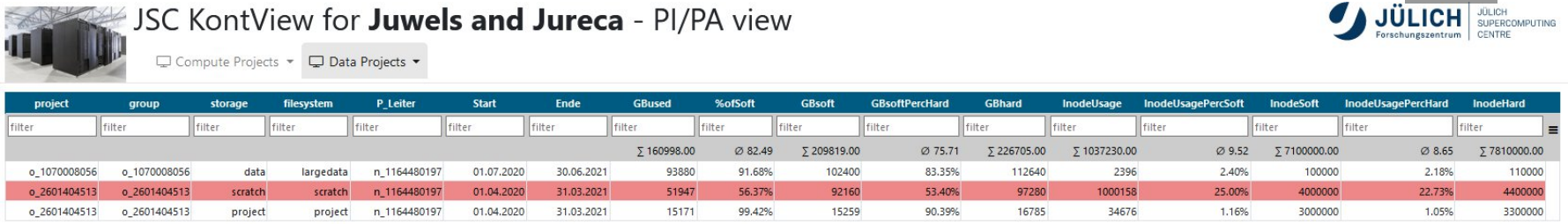


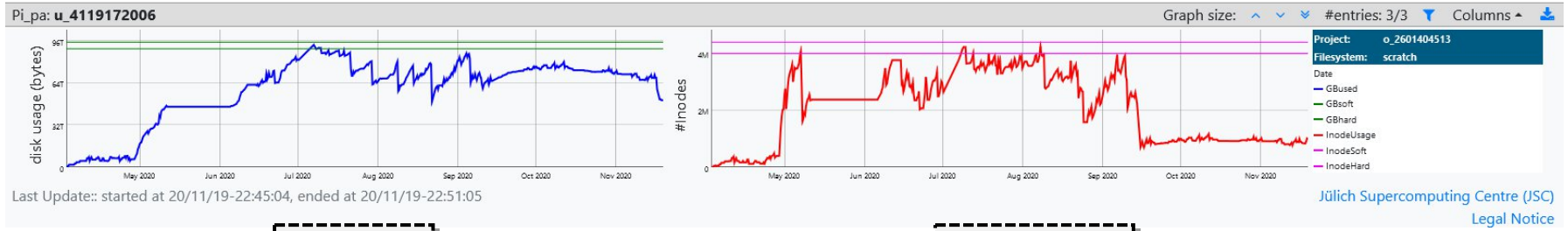
Project quota overview: KontView

PI/PA view:
display quota per user:



Storage utilisation:



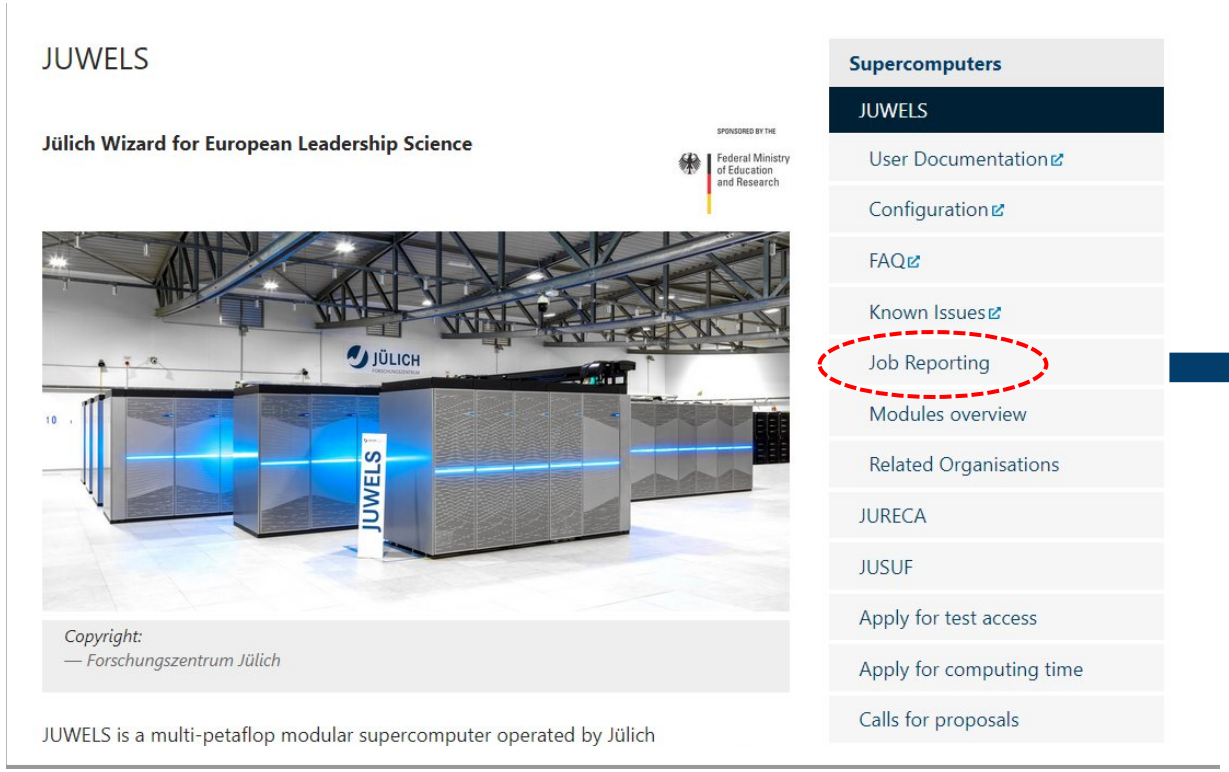


disc usage

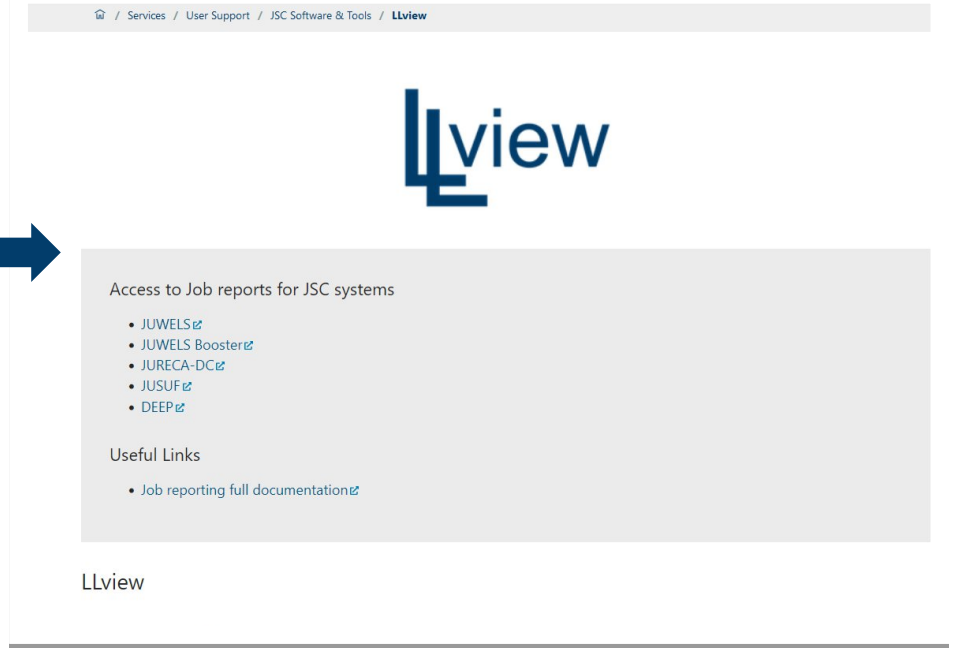
inodes usage

JÜLICH Forschungszentrum

Job monitoring & reports: LLview

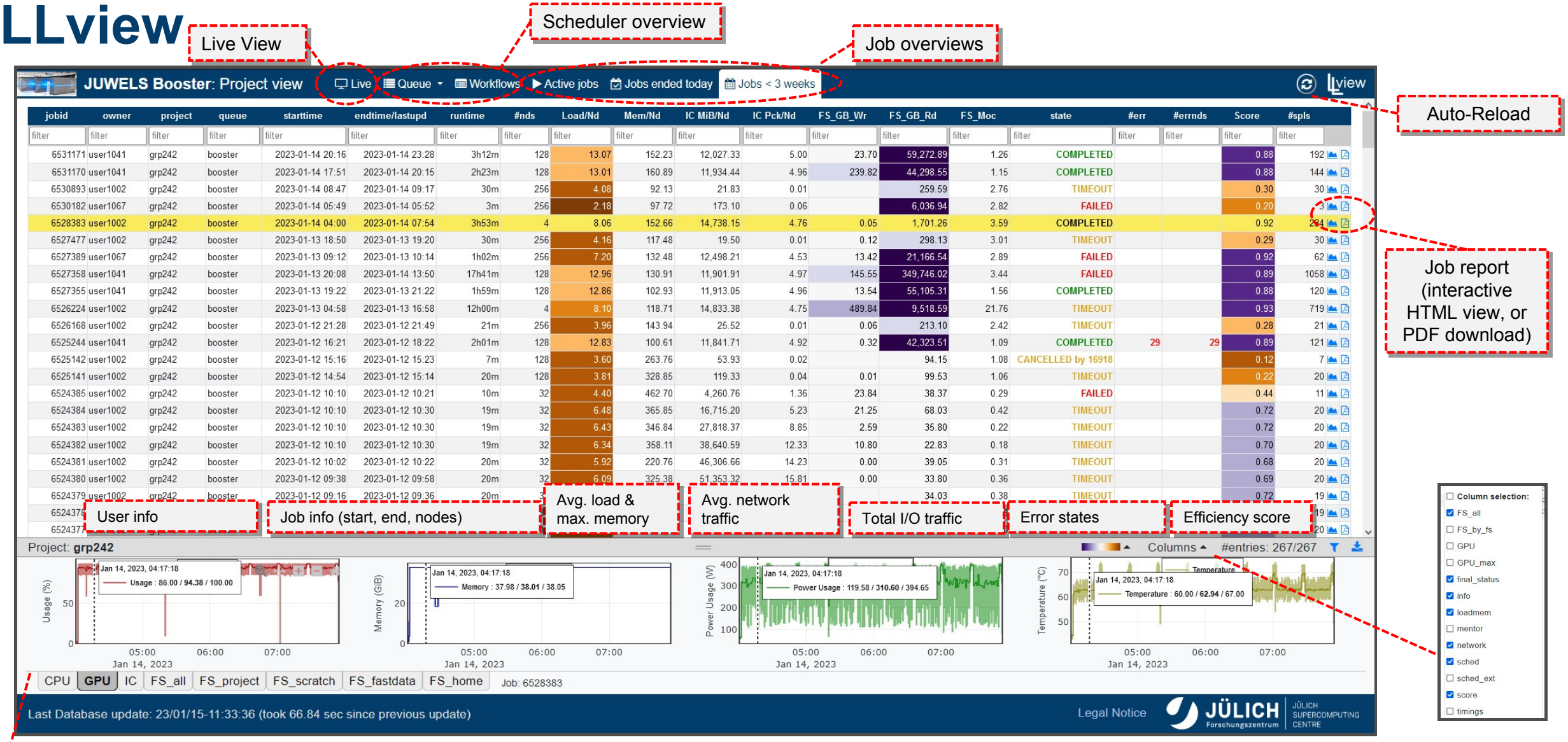


https://llview.fz-juelich.de/<system>



Logindata: JuDoor username & password

LLview



LLview version 2.3.2
December 2024

Job reports

- receive link to job report per email:

```
#!/bin/bash -x
#SBATCH --mail-type=BEGIN,END,FAIL
#SBATCH --mail-user=<email>
```

Job Runtime: 22h40m → 94.42% of Wall: 1d00h00m

Job Start Time:	**2021-11-20 23:58:33**	
Job Last Timestamp:	**2021-11-21 22:38:12**	(Running)
Current Time:	2021-11-21 22:38:12	
Job Endtime (Est.):	2021-11-21 23:58:51	

Queue:	**booster**		
Job Size, #Nodes:	**1**	*#Data Points:*	*1147*
Job Size, #GPUs:	**4**	*#Data Points:*	*901*

Job Performance Metrics

	min.	avg.	max.	
Load (CPU-Nodes):	**1.88**	**4.02**	**4.24**	
Memory (CPU-Nodes):	**20532.40**	**26328.19**	**26384.40**	*MiB*
Interconnect Traffic (in):	**0.00**	**12.73**	**7887.81**	*MiB/s*
Interconnect Traffic (out):	**0.00**	**0.08**	**29.35**	*MiB/s*
Interconnect Packets (in):	**0**	**306**	**2328**	*pck/s*
Interconnect Packets (out):	**1**	**76**	**3658**	*pck/s*

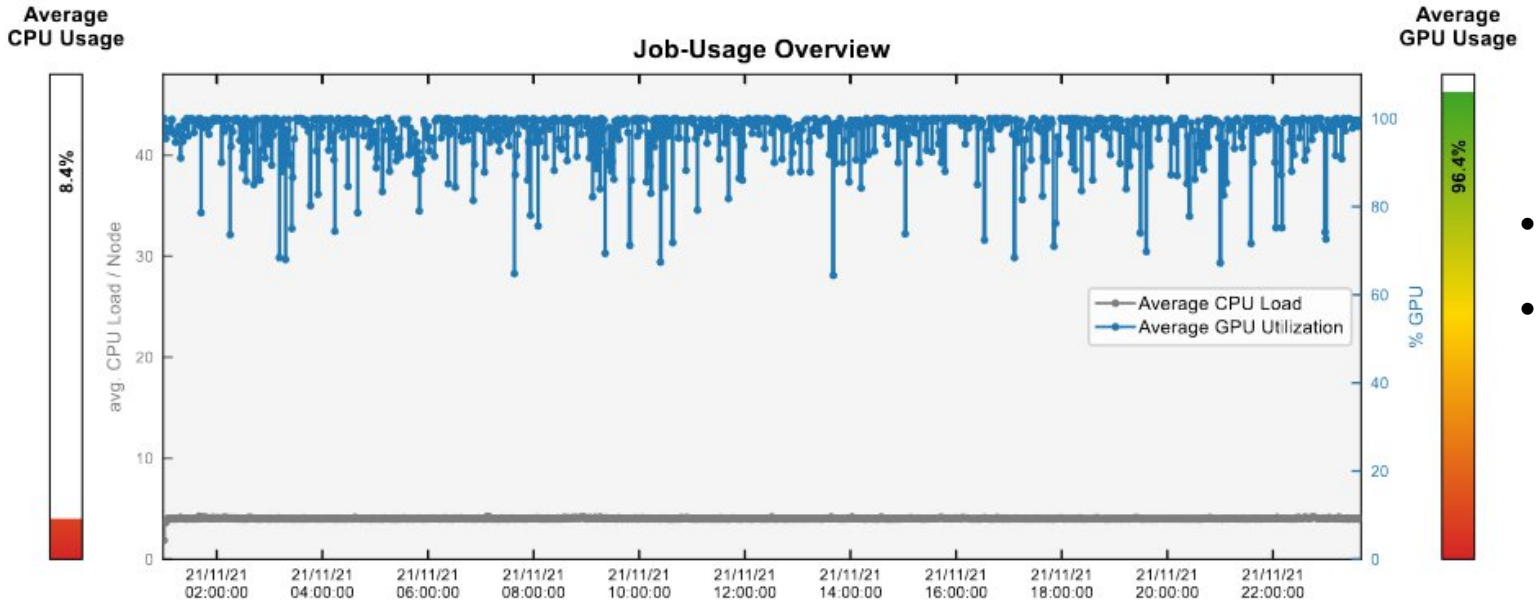
Job I/O Statistics

	Total Data Write	Total Data Read	max. Data Rate/Node Write	max. Data Rate/Node Read	max. Open-Close Rate/Node
$HOME:	**0.00** *MiB*	**0.00** *MiB*	**0.00** *MiB/s*	**0.00** *MiB/s*	**0.00** *op./s*
$PROJECT:	**0.00** *MiB*	**0.00** *MiB*	**0.00** *MiB/s*	**0.00** *MiB/s*	**0.00** *op./s*
$SCRATCH:	**0.00** *MiB*	**0.00** *MiB*	**0.00** *MiB/s*	**0.00** *MiB/s*	**0.00** *op./s*
$FASTDATA:	**0.00** *MiB*	**0.00** *MiB*	**0.00** *MiB/s*	**0.00** *MiB/s*	**0.00** *op./s*

Job GPU Statistics

avg. GPU Usage:	**96.40** %	avg. Mem. Usage Rate:	**13.52** %	avg. GPU Temp.:	**69.03** °C	avg. GPU Power:	**310.22** W
max. Clk Stream/Mem:	**1410/1215** MHz	max. Mem. Usage:	**1738.50** MiB	max. GPU Temp.:	**75.00** °C	max. GPU Power:	**343.43** W

This job will use approximately 1 nodes × 48 cores × 24.000 hours = 1152.00 core-h for the specified walltime (up to now: 1087.68)



- job reports are available for 3 weeks
- job reports can be downloaded as .pdf

Job reports – further job stats

Nodelist

1 jwc07n106 Interconnect group: 88	2 jwc07n107 Interconnect group: 88	3 jwc07n108 Interconnect group: 88	4 jwc07n109 Interconnect group: 88	5 jwc07n110 Interconnect group: 88	6 jwc07n111 Interconnect group: 88	7 jwc07n112 Interconnect group: 88	8 jwc07n113 Interconnect group: 88
			9 jwc07n114 Interconnect group: 88	10 jwc07n115 Interconnect group: 88			

Job Finalization Report

Job State: **FAILED** Job Return Code: **11** Job Signal Number: **0**

Timings (Accounting):

Start Time	**2021-11-20 11:25:20**
End Time	**2021-11-21 10:25:44**
Wall Time	**24.00**
Runtime	**23.00 hours**

Step RCs:

Step: **batch**	RC: **11**	Sig.-Nr: **0**
Step: **0**	RC: **0**	Sig.-Nr: **9**

Node System Error Report

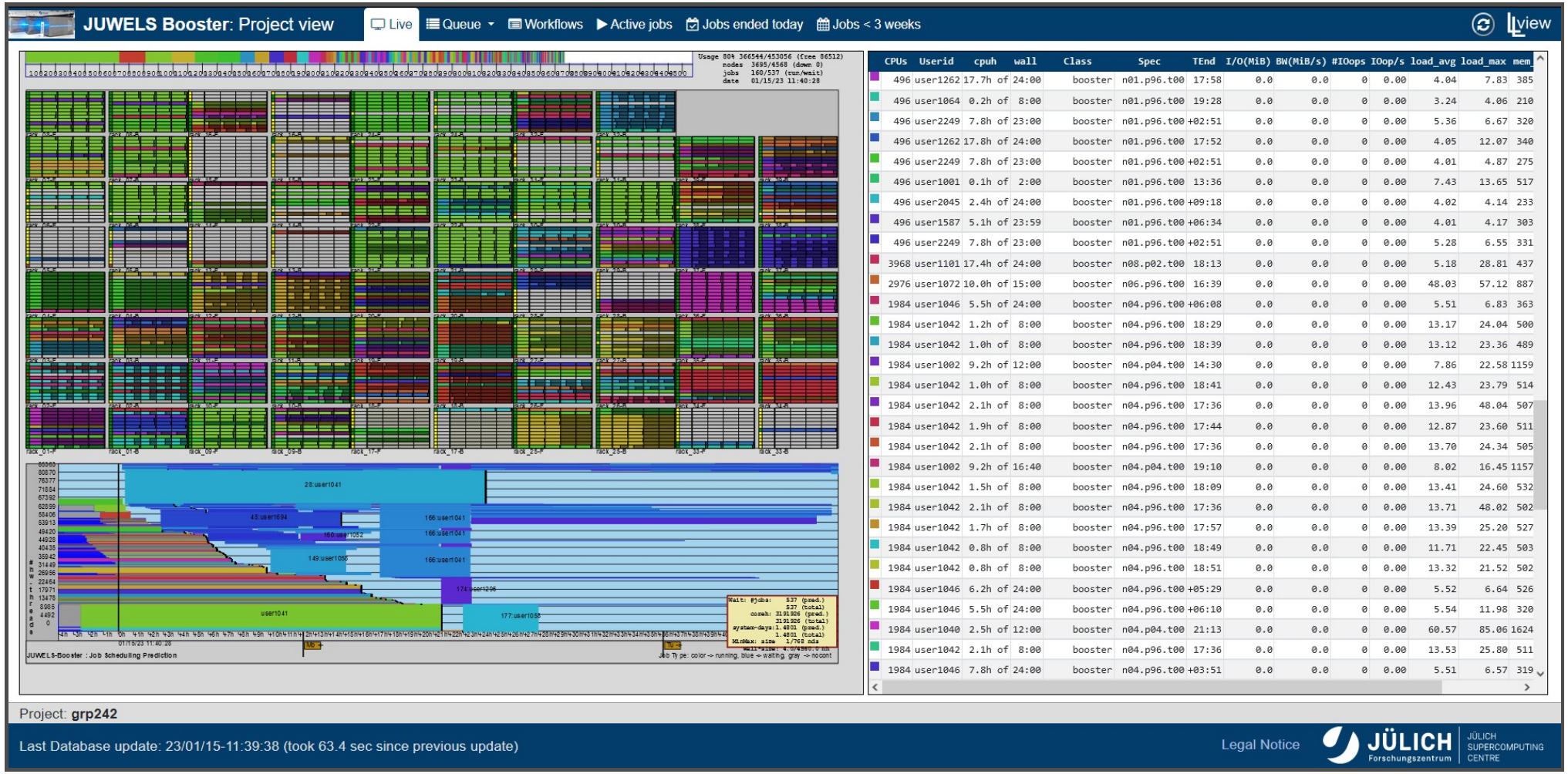
Msgs **1** # Nodes **1**

Error Messages:

```
2021-11-21T10:25:08+0100 jwc07n112.juwels kernel: ramses3d invoked oom-killer: gfp_mask=0x6280ca(GFP_HIGHUSER_MOVABLE|__GFP_ZERO), order=0, oom_
score_adj=0
```

Scheduler overview

- Current usage of system:
  - clickable
  - update 1min
- Mapping of jobs to nodes
- Prediction of system usage using JuFo



JuFo: Simulator for Job Schedulers on HPC Systems, C.Karbach, T.Bauer, JSC

HELP

For *general* questions and inquiries, contact SC support at **sc@fz-juelich.de**.

- *What is your **user ID**? What is the **project ID**?*
- *Which **system** did you use?*
- *If there was an error, what is the **error message**?*
- *Is the error **reproducible**?*
- *If related to a job, what was the **job ID**?*
- *Which **module environment** did you use?*

For *project specific* questions and inquiries, contact your **Mentor**.