

HPC working seminar for physicists

Scientific Computing Department at HIM

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bi-weekly meeting – 26.4.2022



Today's Topics

1. SLURM queuing and fair share
 2. your questions / discussion / requests to the maintainers
- compact in time (15mins + user questions/discussion).
 - bring people together tackling the same problems
 - minutes: <https://www.hi-mainz.de/research/computing/hpc-working-seminar/>

SLURM Scheduler

- Job management includes a scheduler
 - Computational(!) intensive task, every minute.
 - Research ongoing:
 - <https://www.sciencedirect.com/science/article/pii/S1877050915034249>
 - <https://arxiv.org/pdf/2009.08289.pdf>
- “Multifactor Priority” used at Mainz
 - Check config: `/cluster/slurm/etc/slurm.conf`
- Scheduler checks:
 1. Jobs that can preempt
 2. Jobs with an advanced reservation
 3. Partition PriorityTier
 4. Job priority
 5. Job submit time
 6. Job ID

SLURM Multifactor 'Factors'

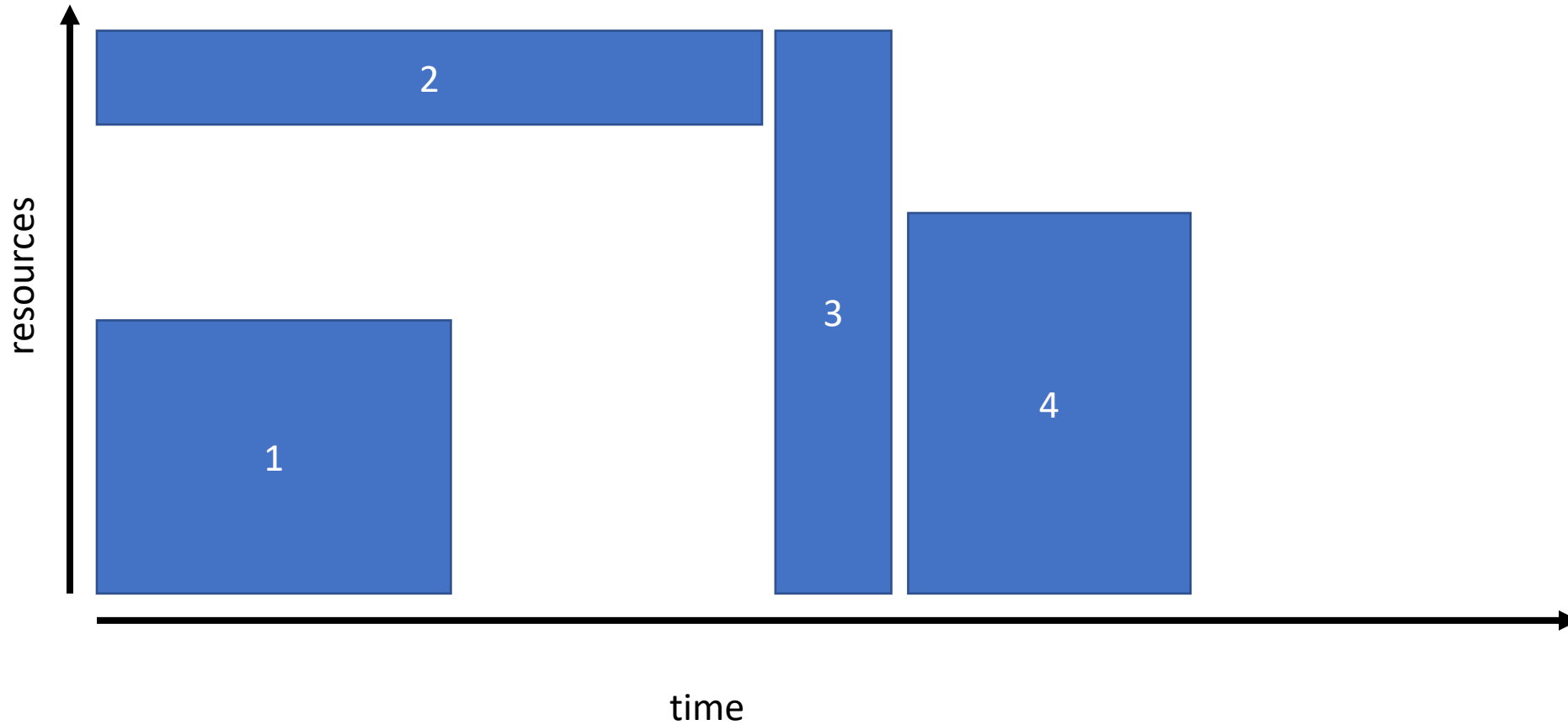
9 factors influence job priority:

- Age: (waiting in the queue)
- Association
- Fair-share (CPU hours with exponential decay)
- Job size (the number of nodes or CPUs a job is allocated)
- Nice (user defined offset factor)
- Partition
- Quality Of Service
- Site (dictated by an administrator)
- TRES

+ weight factors

SLURM scheduler: Multifactor Priority

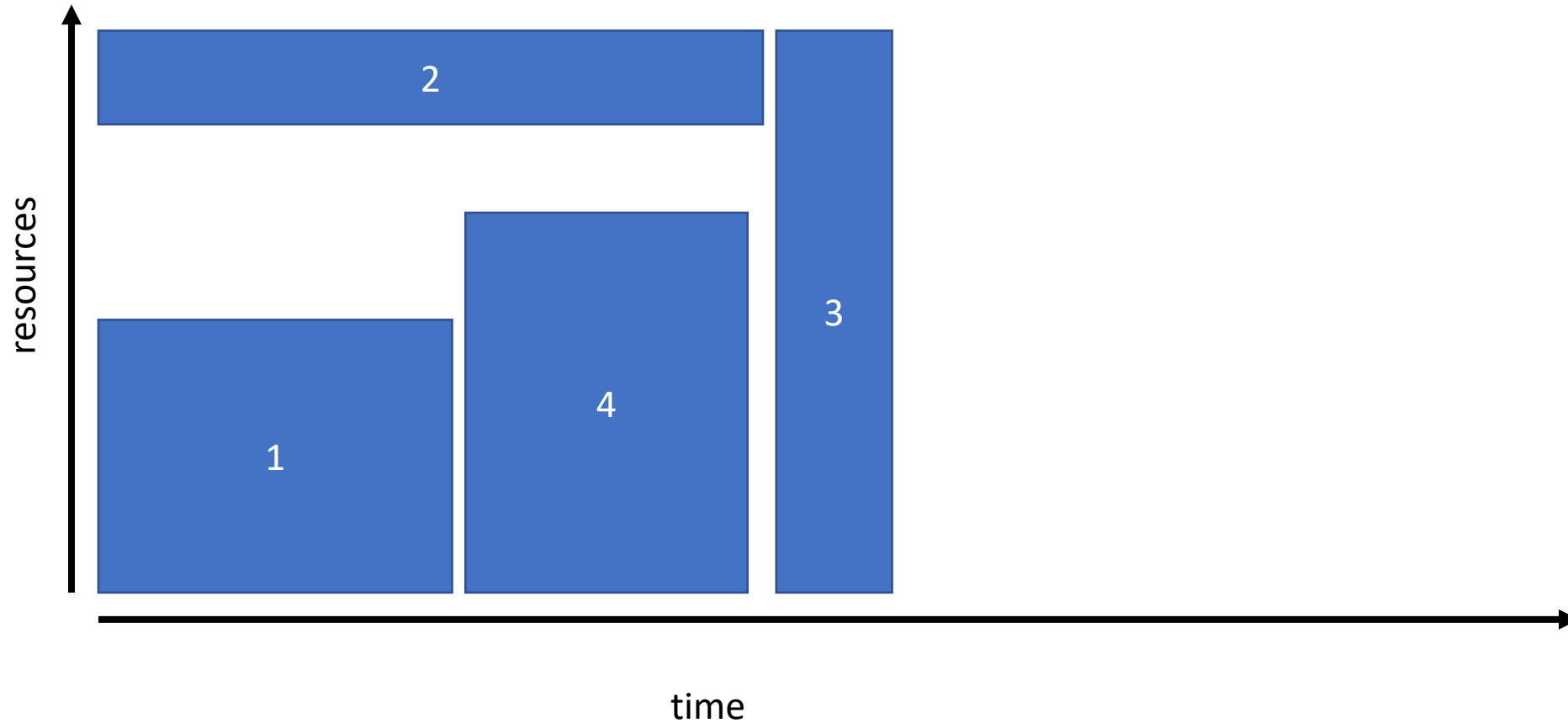
https://slurm.schedmd.com/priority_multifactor.html



SLURM scheduler: Backfilling

Performed only when jobs with higher prio are not affected

https://slurm.schedmd.com/sched_config.html



Hints (1/2)

- When will my jobs start? Why not now:

`queue --start`

- Or with even more info:

```
queue -S -Q -a -o "%20i %10j %10u %15a %11P %5D %5f %5Q %5t %10L  
%80R" -t PD -p himster2_exp
```

- Check for running jobs:

```
queue -t r -p himster2_exp
```

Hints (2/2)

- Use devel queue from Mogon2
- Reserve only as much resources as necessary
- Reserve resources with salloc, use them later several times with srun

- Ask for a (recurring) reservation
- Alter SLURM parameters?
- Developer node on Himster 2 exp?

your questions / discussion /
requests to the maintainers?

Next meeting, 10th May 2022

- Only technical / short meetings during semester break
- Check out www.hi-mainz.de/tfp22
- hand in your topics!

TOOLS FOR PHYSICISTS 2022 WERKZEUGE FÜR PHYSIKER

Be prepared for the real lab work - know how to tackle the problems.
10 independent hands-on topics. Get in touch with the pros in their field.
Focusing on thesis starters (Bachelor, Master, PhD), Postdocs welcome.



Technisches Zeichnen
Mo, 25.4. 14:15, Konferenzraum HIM



Mathematica
We, 15.6. 14:15, HIM Conference Hall



Code Optimization
We, 4.5. 14:15, HIM Conference Hall



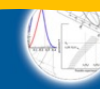
3D Printing and Designing Basics
We, 22.6. 13:00, HIM Conference Hall



Boost your Analysis with High Performance Computing
We, 11.5. 14:15, HIM Conference Hall



PCB Design with KiCAD
We, 29.6. 14:15, HIM Conference Hall



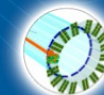
Statistics
We, 18.5. 14:15 + 25.5. + 1.6., HIM Conference Hall



EM Noise & Interference in Measurement Setups
We, 6.7. 14:15, HIM Conference Hall



Estimates, Analogies, Storytelling and Handwaving for Physicists
We, 8.6. 14:15, HIM Conference Hall



Geant 4
We, 13.7. 14:15 + 20.7., HIM Conference Hall

Visit the course webpage and register today! www.hi-mainz.de/tfp22
Registration mandatory, limited seats.
Organised by Dr. Peter-Bernd Otte (HIM)



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