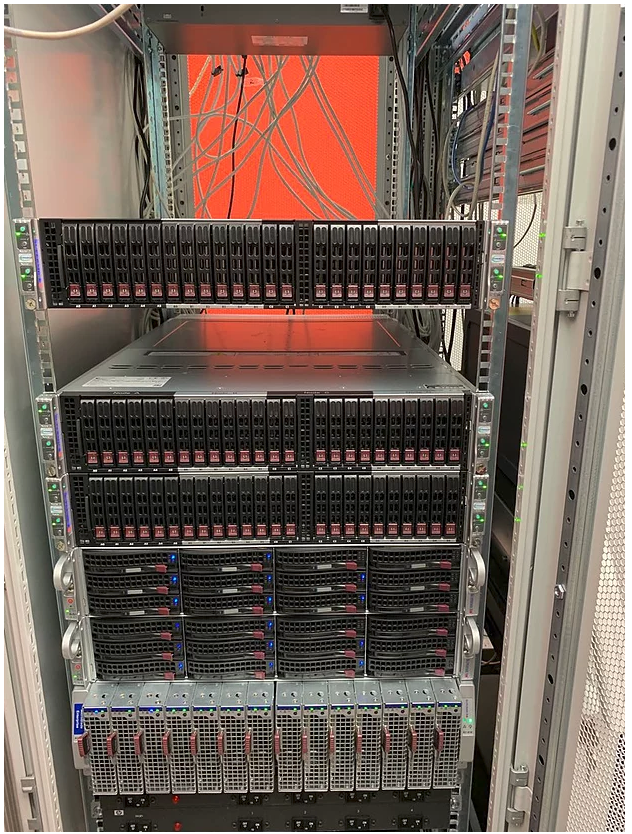
ZTF computer cluster



Ivor Lončarić

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Development

1) 2016 UKF Lazić 335k HRK
2) 2017 UKF Lazić 70k HRK
3) 2017 HrZZ Franchini 100k HRK
4) 2019 CEMS Lončarić 170k HRK
5) 2019 Sinergija ZTF 400k HRK
6) 2020 PZS Lončarić 340k HRK
7) 2021 HrZZ Grisanti 300k HRK
8) 2021 Hrzz Lončarić 330k HRK

Significance

- The only capital equipment of ZTF
- Total over 2M HRK
- Enables competitive research in theoretical physics, especially in condensed matter
- Potential for commercial activities

Technical details - hardware

- 2 management/storage nodes, RAID 10 storage 40TB, RAID 5 storage 18 TB
- 28 nodes: 8 Intel Xeon cores + 64 GB RAM
- 8 nodes: 48 AMD Epyc cores + 256 GB RAM
- 4 nodes: 64 AMD Epyc + 512 GB RAM
- 4 nodes: 64 AMD Epyc + 256 GB RAM
- 1 GPU server for ML
- 10 G network between all nodes and storage

Technical details - disks

- /home (slow) and /storage (fast) available from everywhere
- /scratch (very fast) on some nodes
- No backup!

Technical details - software

- OpenHPC
- Centos 8
- SLURM
- Environment Module System
- Anaconda for Python
- Intel and GNU compilers

How to use

- Send me e-mail with request for opening the account
- Choose username and password
- Login via ssh username@10.133.24.18 (available only from IRB internal network)
- Prepare sumbission script, software, inputs
- Run job, collect data and enjoy

Submission script example - serial

```
#!/bin/bash
#SBATCH --partition=serial
#SBATCH --job-name=test
#SBATCH --cpus-per-task=1
#SBATCH --mem=2gb
#SBATCH --nodes=1
#SBATCH --ntasks-per-node=1
#SBATCH --output=%x-%j.out
#SBATCH --error=%x-%j.err

module load Anaconda3

python test.py > log
```

Submission script example - parallel

```
#!/bin/bash
#SBATCH --partition=normal
#SBATCH --job-name=test
#SBATCH --cpus-per-task=1
#SBATCH --mem=100gb
#SBATCH --nodes=1
#SBATCH --ntasks-per-node=24
#SBATCH --output=%x-%j.out
#SBATCH --error=%x-%j.err

module purge
module load QE/6.8
export MKL_CBWR="AVX2"
export I_MPI_FABRICS=shm:ofi
ulimit -s unlimited
mpiexec.hydra -bootstrap slurm -n $SLURM_NTASKS pw.x -i scf.in > scf.out
```

Typical use

- Submit the script to SLURM with:
  sbatch script.sh
- Check status with:
  squeue
- Copy results to your PC or backup:
  scp ...

Support

- No support, try:

  1) Google
  2) Ask colleague with more experience how to google

  99) Ask me, but understand that I manage the cluster in my free time