Reference

Quick reference guides, cheat sheets, and troubleshooting for TAU HPC

- Common Slurm Commands
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Common Slurm Commands

Quick reference for the most common Slurm commands on the TAU HPC cluster.

Submitting Jobs

Command	Description
`sbatch job.sh`	Submit a batch job script
`srun --pty bash`	Start an interactive session
`sbatch --depend=afterok:JOBID job.sh`	Submit job after another completes

Monitoring Jobs

Command	Description
`squeue -u username`	Your running and pending jobs
`squeue`	All jobs on the cluster
`scontrol show job JOBID`	Full details of a job
`sacct -j JOBID --format=JobID,JobName,State,MaxRSS,Elapsed`	Job accounting and memory usage
`sattach JOBID`	Attach to a running job's output

Managing Jobs

Command	Description
`scancel JOBID`	Cancel a specific job
`scancel -u username`	Cancel all your jobs

Cluster Information

Command	Description
`sinfo`	Partition and node status
`scontrol show partition PARTITION`	Partition details and limits
`check_my_partitions`	Your available partitions and accounts
`features`	Available node constraints/features

Environment Modules

Command	Description
`module avail`	List all available modules
`module avail NAME`	Search for a specific module
`module spider NAME`	Detailed module info including dependencies
`module load NAME`	Load a module
`module list`	List loaded modules
`module unload NAME`	Unload a module
`module purge`	Unload all modules

Common SBATCH Directives

Directive	Description
`#SBATCH --job-name=NAME`	Job name
`#SBATCH --account=ACCOUNT`	Account name
`#SBATCH --partition=PARTITION`	Partition/queue
`#SBATCH --qos=QOS`	Quality of Service
`#SBATCH --time=HH:MM:SS`	Max run time
`#SBATCH --ntasks=N`	Number of tasks
`#SBATCH --nodes=N`	Number of nodes
`#SBATCH --cpus-per-task=N`	CPU cores per task
`#SBATCH --mem-per-cpu=NG`	Memory per CPU
`#SBATCH --mem=NG`	Total memory
`#SBATCH --gres=gpu:N`	Number of GPUs
`#SBATCH --constraint=FEATURE`	Node constraint/feature

Directive	Description
`#SBATCH --array=1-N`	Job array
`#SBATCH --output=FILE_%j.out`	Output file (%j = job ID)
`#SBATCH --error=FILE_%j.err`	Error file
`#SBATCH --mail-user=EMAIL`	Notification email
`#SBATCH --mail-type=END,FAIL`	When to notify

PBS to Slurm Migration

Quick reference for users migrating from the old PBS/Torque system to Slurm.

Command Equivalents

PBS/Torque	Slurm	Description
`qsub job.sh`	`sbatch job.sh`	Submit a job
`qsub -I`	`srun --pty bash`	Interactive session
`qstat`	`squeue`	View jobs
`qstat -u username`	`squeue -u username`	Your jobs
`qdel JOBID`	`scancel JOBID`	Cancel a job
`pbsnodes`	`sinfo`	Node status
`qstat -f JOBID`	`scontrol show job JOBID`	Job details

Directive Equivalents

PBS/Torque	Slurm	Description
`#PBS -N name`	`#SBATCH --job-name=name`	Job name
`#PBS -q queue`	`#SBATCH --partition=partition`	Queue/partition
`#PBS -l nodes=1:ppn=8`	`#SBATCH --nodes=1 --cpus-per-task=8`	Nodes and cores
`#PBS -l mem=4gb`	`#SBATCH --mem=4G`	Memory
`#PBS -l walltime=02:00:00`	`#SBATCH --time=02:00:00`	Wall time
`#PBS -o output.log`	`#SBATCH --output=output.log`	Output file
`#PBS -e error.log`	`#SBATCH --error=error.log`	Error file
`#PBS -M email`	`#SBATCH --mail-user=email`	Email
`#PBS -m abe`	`#SBATCH --mail-type=BEGIN,END,FAIL`	Mail events
`#PBS -V`	`#SBATCH --export=ALL`	Export environment
`#PBS -t 1-10`	`#SBATCH --array=1-10`	Job array

Environment Variables

PBS/Torque	Slurm	Description
`$PBS_JOBID`	`$SLURM_JOB_ID`	Job ID
`$PBS_JOBNAME`	`$SLURM_JOB_NAME`	Job name
`$PBS_NODEFILE`	`$SLURM_JOB_NODELIST`	Node list
`$PBS_ARRAYID`	`$SLURM_ARRAY_TASK_ID`	Array task ID
`$PBS_NP`	`$SLURM_NTASKS`	Number of tasks
`$PBS_O_WORKDIR`	`$SLURM_SUBMIT_DIR`	Submission directory

Key Differences

- Slurm requires `--account` and `--qos` — run `check_my_partitions` to find yours
- Slurm uses `--cpus-per-task` instead of `ppn`
- Memory in Slurm is per-CPU (`--mem-per-cpu`) or total (`--mem`)
- Slurm does not automatically change to the submission directory — add `cd $SLURM_SUBMIT_DIR` to your script if needed

Troubleshooting

Common errors and solutions for job submission and cluster usage.

Job Submission Errors

No partition specified

```
srun: error: Unable to allocate resources: No partition specified or system default partition
```

Always specify a partition. Run `check_my_partitions` to find yours.

Invalid account or partition

```
sbatch: error: Batch job submission failed: Invalid account or account/partition combination specified
```

Your account and partition combination is incorrect. Run `check_my_partitions` and make sure both match.

QOS not permitted

```
sbatch: error: Batch job submission failed: Job violates accounting/QOS policy
```

The QOS you specified doesn't match your account/partition. Run `check_my_partitions` to see valid combinations.

Job Failures

Out of Memory (OOM)

```
sacct -j JOBID -o JobID,JobName,State%20

JobID    JobName               State
-------- -------------------- --------------------
71       my_job        OUT_OF_MEMORY
```

Your job used more RAM than allocated. Resubmit with a higher `--mem` or `--mem-per-cpu`. To estimate needed memory:

```
sacct -j JOBID --format=JobID,JobName,MaxRSS,Elapsed
```

Timeout

Job state shows `TIMEOUT` — your job exceeded the time limit. Resubmit with a longer `--time` value.

Job stuck in Pending (PD)

Check the reason:

```
squeue -u username -o "%.18i %.9P %.8j %.8u %.2t %.10M %.6D %R"
```

Common reasons:

- **Resources** — cluster is busy, wait for nodes to free up
- **QOSMaxCpuPerUserLimit** — you've hit your CPU quota, wait for running jobs to finish
- **InvalidQOS** — wrong QOS, check `check_my_partitions`
- **ReqNodeNotAvail** — requested node is down, remove `--nodelist` constraint

NFS / Storage Issues

Job hangs or freezes on file operations

May indicate an NFS mount issue. Check if your home directory is accessible:

```
ls ~
```

If it hangs, contact HPC support — do not kill the job manually as it may cause further issues.

Disk quota exceeded

```
bash: cannot create temp file: Disk quota exceeded
```

Your home directory is full. Move large files to scratch space or contact HPC support for a quota increase.

Module Issues

Module not found

```
module avail MODULE_NAME
```

Check the exact module name. Use `module spider MODULE_NAME` for a broader search including partial matches.

Getting Help

If you can't resolve an issue, contact HPC support at hpc@tauex.tau.ac.il. Include:

- Your username
- Job ID
- The command you ran
- The full error message

Security Installations

Required security software for TAU workstations and servers.

NAC — Forescout

Network Access Control client required for connecting to the TAU network.

ForeScoutSecureConnector_64_visible_daemon.tar.gz

Installation

```
tar -zxvf ForeScoutSecureConnector_64_visible_daemon.tar.gz
cd secure_connector
./install.sh
systemctl start SecureConnector.service
```

EDR — CrowdStrike Falcon

Endpoint Detection and Response client.

- falcon-sensor_7.18.0-17106_amd64.deb — Ubuntu 22.04 / 24.04
- falcon-sensor_7.39.0-19203_amd64.deb — Ubuntu 24.04
- falcon-sensor-7.17.0-17005.el9.x86_64.rpm — Rocky / RHEL

Installation — Ubuntu

```
dpkg -i falcon-sensor_7.18.0-17106_amd64.deb
systemctl restart falcon-sensor.service
```

Installation — Rocky / RHEL

```
rpm -ivh falcon-sensor_7.17.0-17005.el9.x86_64.rpm
systemctl restart falcon-sensor.service
```

Registration (new installations only)

```
/opt/CrowdStrike/falconctl -s --cid=<cid-code>
```

To obtain the CID code, contact infosec@tauex.tau.ac.il.

PBS --> Slurm Converter

```
loading
```

HPC Price List

Item	תירבעב רואית	English Description	Price (₪/year)
Power Base - total power users	סייונפה סיבאשמב שומישל הכימת לש סיתרש ללוכש, רוביצה שומישל ךגאהש סיתרש סגו סירחא סירקוח רובע דחוימב הצקה בושחמל סיתרשה יבג לע וצורת סא .לוכשאה סתוא וכרטצי סהו סירחא סירקוח לש, השדח הצירל וסנכי סכלש תוצירה (סה, האיצי תודוקנ סתרמש סא רשאכ רבכ הז לבא, הלחתההמ וליחתי אל סכב יולת).	Support for the use of publicly available resources, including servers of other researchers and servers that the Computing Department has allocated especially for the cluster. If you operate off of servers belonging to other researchers and they need them, your runs will move to a new run (and if you've saved exit points, they will not start from the beginning, but that part is your responsibility).	2996.00
SSL Certificate (HPC) - תדועת הנפצה	תרובעת תנפצהל, הנפצה תדועת, סירתא הנשל ךקות סע	SSL Certificate for encryption of website traffic, with expiry of one year.	250.00
hosting 0-5 years	סלואב יטרפ תרשב חוריאו הכימת סינש 5 דע 0 ויב ענ וליג רשא יזכרמה	Support and hosting fee for a private servers hosted in the main Computation Center DC (Data Center) whose age ranges from 0 to 5 years	550.00
hosting 6-8 years	סלואב יטרפ תרשב חוריאו הכימת סינש 8 דע 6 ויב ענ וליג רשא יזכרמה	Support and hosting fee for a private servers hosted in the main Computation Center DC (Data Center) whose age ranges from 6 to 8 years	1100.00
Minimal Hosting	ךגאב סיתרשה סלואב תרש חוריא יתורש) ילמינימ תוריש סע בושחמ הכימת אלל עבצא)	Hosting a server in the computation center DC (Data Center) with no support, meaning with minimal service support (finger on/off services only)	4939.00
GPU / Storage	וא וסחא תרש רובע הכימת תפסות, ינשב תויפארג תוביל סע תרש לש הדובע תפסותב רבודמ סירקמה לש הרקמב תואצקהו תואשרהה הרקמב תומאתהו תונקתהו וסחאה תויפרגה תובילה לש	Addition support for a storage server or a server with GPU, in both cases it is an additional work of the permissions and assignments in the case of the storage and installations and adjustments in the case of GPU	1100.00
Power node 0-5 years	לוכשאב תרשב חוריאו הכימת 0 ויב ענ וליג רשא יזכרמה בושחמה סינש 5 דע	Support had hosting fee for a server in the central computing cluster whose age ranges from 0 to 5 years	275.00
Power node 6-8 years	לוכשאב תרשב חוריאו הכימת 6 ויב ענ וליג רשא יזכרמה בושחמה סינש 8 דע	Support had hosting fee for a server in the central computing cluster whose age ranges from 6 to 8 years	550.00
Powerweb	יעדמ בושחמל וישיר/בוו יתרש	HPC web/license server	1804.00
Add 1GB RAM to a powerweb website	בוו תרשל הגיג לש וורכיז תפס	Add 1GB RAM to a powerweb website	500.00

Item	תירבעב רואית	English Description	Price (₪/year)
Hosting Base - total hosted in the DC	יתרשב הכימתו חוריאל סיסב תולע יזכרמה סיתרשה סלואב יעדמ בושחמ	Base fee for Hosting and support for scientific computing servers in the Computation Center DC (Data Center)	3630.00
Remote Cluster	קחורמ בושחמ לוכשאל הכימת תוריש, בושחמ ץפגא ויינבב אצמנ וניא רשא	Remote cluster support, for servers not in the Computation Center DC (Data Center)	32600.00
Remote Cluster Node (when above 10 nodes)	לוכשאב ץסונ תרש לכל הכימת סיתרש 10 לעמ ללוכה קחורמ בושחמ	Support fee for every additional node above 10 nodes in a Remove Cluster	1100.00
WS (Work Station)	תקחורמ הדובע תנחתב הכימת	WorkStation linux base support	1320.00
Minimal Hosting 0-5 years	ץגאב סיתרשה סלואב תרש חוריא יתורש) ילמינימ תוריש סע בושחמ 0 ויב ענ וליג רשא (הכימת אלל עבצא סינש 5 דע	Hosting a server,whose age ranges from 0 to 5 years, in the computation center DC (Data Center) with no support, meaning with minimal service support (finger on/off services only)	550.00
Minimal Hosting 6-8 years	ץגאב סיתרשה סלואב תרש חוריא יתורש) ילמינימ תוריש סע בושחמ 6 ויב ענ וליג רשא (הכימת אלל עבצא סינש 8 דע	Hosting a server,whose age ranges from 6 to 8 years, in the computation center DC (Data Center) with no support, meaning with minimal service support (finger on/off services only)	1100.00
Pay by the Hour (Hours X Quantity)	הדובע תועש יפל סולשת (העש ריחמ X תומלש תועש)	Pay for manpower by the hour	250.00