**Example serial job scripts on the Linux-Cluster**

- **Introductory remarks**
  The job scripts for SLURM partitions are provided as templates which you can adapt for your own settings. In particular, you should account for the following points:

  - Some entries are **placeholders**, which you **must replace with correct, user-specific settings**. In particular, path specifications and e-Mail addresses must be adapted. Always specify the appropriate directories instead of the names with the three periods in the following examples!
  - In case you have to work with the environment modules package in your batch script, you also have to source the file `/etc/profile.d/modules.sh`.

- **Time and Memory Requirements**
  Try to estimate the time and mem require as close as possible to your needs. This help to prevent idling nodes or CPUs.

- **Serial jobs**
  This job type normally uses a single core on a shared memory node of the designated SLURM partition. The CPUs of the node are shared with other users.

<table>
<thead>
<tr>
<th>Serial job</th>
<th>Serial job (long running)</th>
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</table>
  | `#!/bin/bash`  
  | `## a job which uses 1 core of a node`  
  | `#SBATCH -o /home/hpc/.../.../myjob.%j.%N.out`  
  | `#SBATCH -D /home/hpc/.../.../mydir`  
  | `#SBATCH -J Jobname`  
  | `#SBATCH --get-user-env`  
  | `#SBATCH --clusters=serial`  
  | `#SBATCH --partition=serial_mpp2`  
  | `#SBATCH --mem=800mb`  
  | `#SBATCH --cpus_per_task=1`  
  | `#SBATCH --mail-user=xyz@xyz.de`  
  | `#SBATCH --export=NONE`  
  | `#SBATCH --time=24:00:00`  
  | `source /etc/profile.d/modules.sh`  
  | `cd mydir`  
  | `./myprog.exe`  | `#!/bin/bash`  
  | `## a job which uses 1 core of a node`  
  | `#SBATCH -o /home/hpc/.../.../myjob.%j.%N.out`  
  | `#SBATCH -D /home/hpc/.../.../mydir`  
  | `#SBATCH -J Jobname`  
  | `#SBATCH --get-user-env`  
  | `#SBATCH --clusters=serial`  
  | `#SBATCH --partition=serial_long`  
  | `#SBATCH --mem=800mb`  
  | `#SBATCH --cpus_per_task=1`  
  | `#SBATCH --mail-user=xyz@xyz.de`  
  | `#SBATCH --export=NONE`  
  | `#SBATCH --time=24:00:00`  
  | `source /etc/profile.d/modules.sh`  
  | `cd mydir`  
  | `./myprog.exe` |

- **Shared Memory jobs**
  For very large memory jobs (more than 8 GByte and up to 240 GBytes) or (going beyond 1 TByte) the `teramem_inter` partition in the interactive segment should be used.

<table>
<thead>
<tr>
<th>Shared memory job</th>
<th>Large memory job</th>
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<tbody>
<tr>
<td>up to 28 cores with up to 50 GByte memory</td>
<td>with a single core and up to 240 GB memory</td>
</tr>
</tbody>
</table>
#!/bin/bash
#SBATCH -o /home/hpc/.../.../myjob.%j.%N.out
#SBATCH -D /home/hpc/.../.../mydir
#SBATCH -J Jobname
#SBATCH --get-user-env
#SBATCH --clusters=serial
#SBATCH --partition=serial_mpp2
#SBATCH --mem=10000mb
#SBATCH --cpus-per-task=7
#SBATCH --mail-user=xyz@xyz.de
#SBATCH --time=8:00:00

source /etc/profile.d/modules.sh
cd mydir
export OMP_NUM_THREADS=7
./myprog.exe

If you do not specify mem then 1.7GB*cpus_per_task will be used, which is also a good balance

<table>
<thead>
<tr>
<th>Large memory job with shared memory multithreading with up to 20 cores and up to 240 GB memory</th>
<th>Shared memory job on HP DL580 “teramem1” with shared memory multithreading with up to 96 cores and 6 TByte of memory</th>
</tr>
</thead>
</table>

#!/bin/bash
#SBATCH -o /home/hpc/.../.../myjob.%j.%N.out
#SBATCH -D /home/hpc/.../.../mydir
#SBATCH -J Jobname
#SBATCH --get-user-env
#SBATCH --clusters=
#SBATCH --partition=
#SBATCH --cpus-per-task=10
#SBATCH --mem=20000mb
#SBATCH --mail-user=xyz@xyz.de
#SBATCH --time=8:00:00

source /etc/profile.d/modules.sh
cd mydir
export OMP_NUM_THREADS=10
./myprog.exe

Use teramem only if you need more than 240 GByte memory! Try to parallelize your application, otherwise some cores will be kept idle. Then, use more cpus_per_task and more OpenMP threads (OMP_NUM_THREADS). A good balance is 600GB per core.

TSM Archivation

TSM archivation is only supported on the login nodes of the cluster, not on the SLURM-controlled batch nodes. Please consult the document describing tape archivation on our HPC systems for more details on TSM usage.