

Worksheet 1 Report

Team: Sahin Cakrak, Mat.id.: 2291152, email: uckrp@student.kit.edu

Stefan Häbe, Mat.id: 2238079, email: uzzrs@student.kit.edu

Exercise 1

This exercise was about setting up the SSH-connection to the cluster in order to execute the simulations more efficiently than it would be locally. We have done this via openSSH. openSSH was locally installed via homebrew. after that for the SSH-connection for the cluster we had to set up an authentication device. With this and the SCC feedback this exercise was concluded.

Exercise 2

Here we set up the compilers and adjust the configuration-file via nano so that we can modify the lines CXX to mpic++ and PARALLEL_MODE to MPI. For visualisation purposes next up in the exercise was to work on the directory [examples/laminar/cavity3dBenchmark](#). After compiling this example and creating a workspace we run a suited bashscript which was provided by the Worksheet itself. By submitting the job and waiting for the job-completion we receive the results which we can call via nano. The results revealed are as follows:

```

GNU nano 2.9.8                               slurm-24553260.out                               Verändert
/var/spool/slurmd/job24553260/slurm_script: Zeile 10: export: `/pfs/work7/workspace/scratch/uckrp-example/': Ist kein gültiger Bezeichner.
mkdir: das Verzeichnis „/job_24553260“ kann nicht angelegt werden: Keine Berechtigung
ln: die symbolische Verknüpfung 'tmp' konnte nicht angelegt werden: Die Datei existiert bereits
100, 100, 1, 1, 1, 14.6433
100, 100, 1, 2, 1, 23.767
100, 100, 1, 4, 1, 50.7788
100, 100, 1, 5, 1, 56.6099
100, 100, 1, 10, 1, 106.326
100, 100, 1, 20, 1, 176.724
100, 100, 1, 30, 1, 215.094
100, 100, 1, 40, 1, 245.31

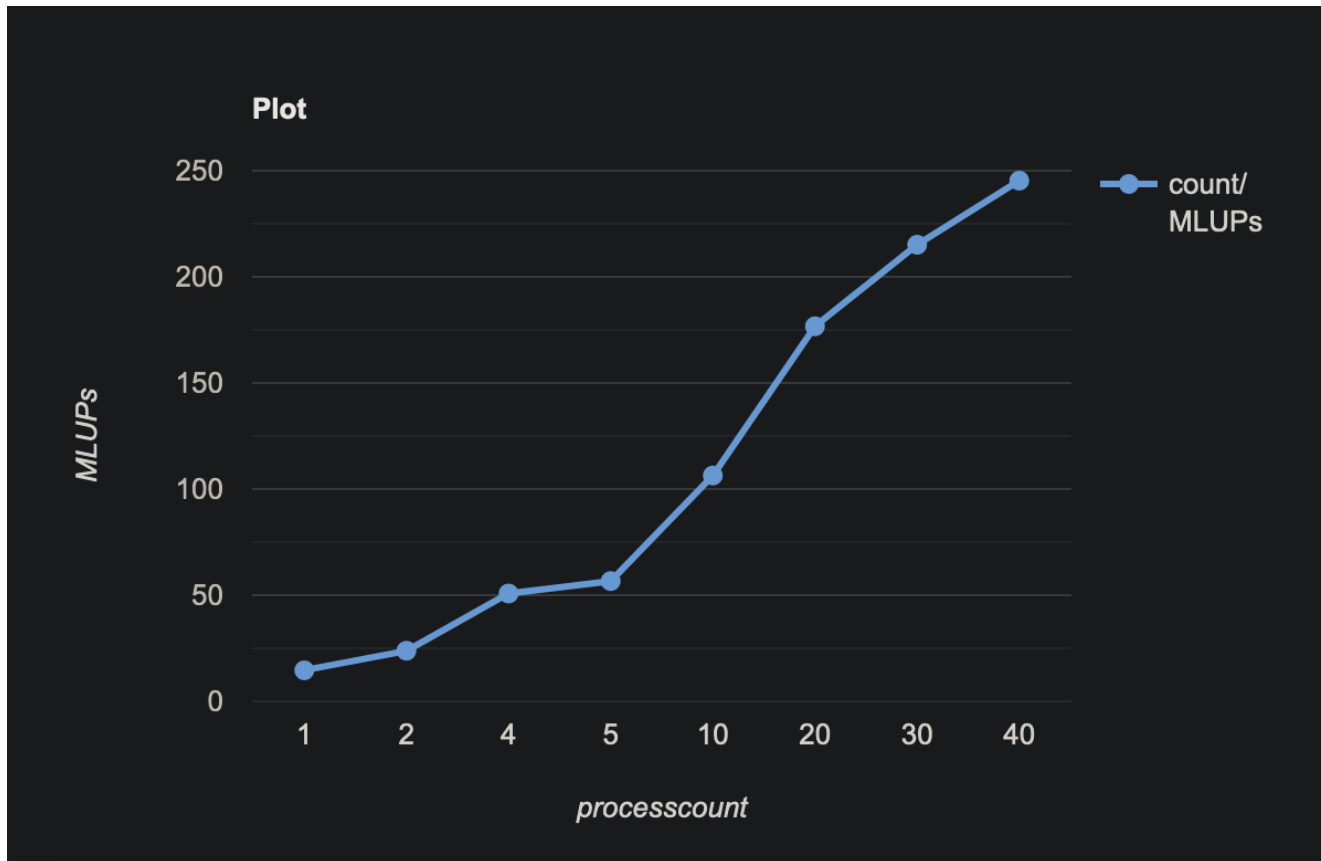
===== JOB FEEDBACK =====

NodeName=uc2n285
Job ID: 24553260
Cluster: uc2
User/Group: uckrp/stud
State: COMPLETED (exit code 0)
Nodes: 1
Cores per node: 80
CPU Utilized: 00:02:45
CPU Efficiency: 3.12% of 01:28:00 core-walltime
Job Wall-clock time: 00:01:06
Memory Utilized: 1.01 GB
Memory Efficiency: 1.15% of 87.89 GB

```

On this we can see how the scaling of the process count affects the MLUPs. an according

graph is as follows:



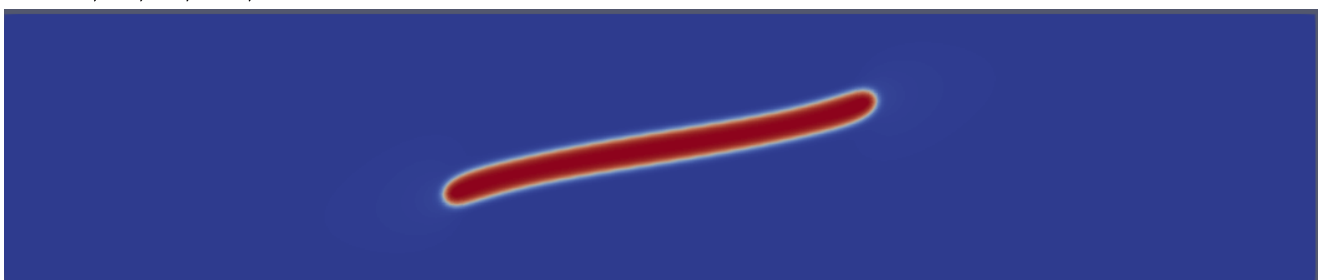
This concluded exercise 2.

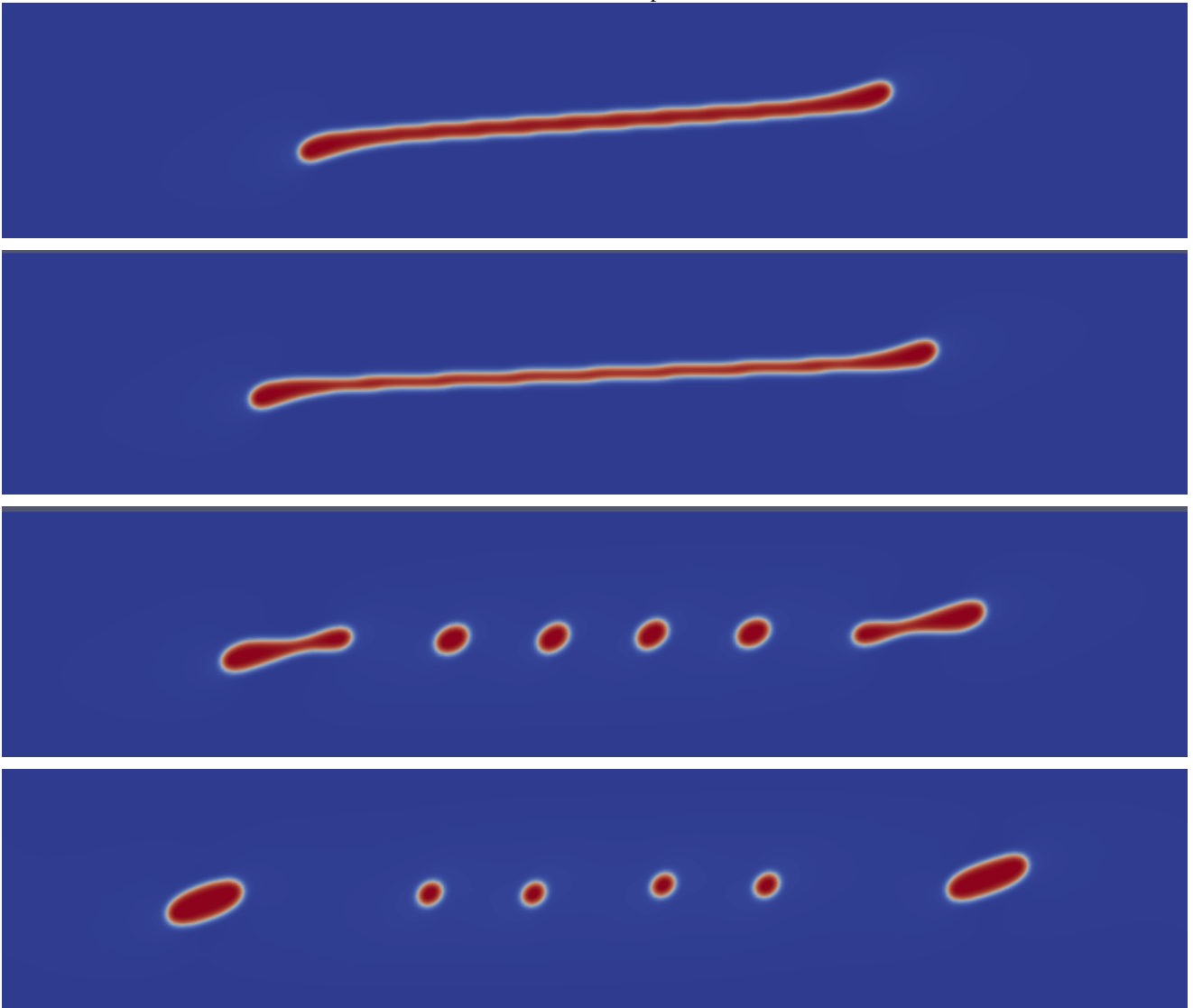
Exercise 3

Here the routine is identical to exercise 2, this time we work on the directory `examples/multiComponent/binaryShearFlow2d`. After compilation and job-submission we receive a `tmp` folder which we compress via the `tar hcvzf tmp.tar.gz tmp`-command. After transferring this file to the local computer and extracting it we ran the command

```
paraview tmp/vtkData/binaryShearFlow2d.pvd
```

using `paraview` as instructed in the worksheet, we plotted the following on the timestamps $t = 30, 60, 90, 120, 150$:





This concludes the exercise and as such worksheet 1.