

Parallel Algorithms

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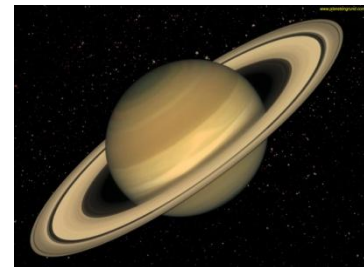
Sprechstunde: Monday, 13-15

TU Wien parallel computing shared-memory node

4xAMD „**magny cours**“ 12-core Opteron 6168 processors
128GByte main memory, 1.9GHz, total number of cores 48

- Per core L1 cache: 128KB
- Per core L2 cache 512KB
- Shared L3 cache 12288KB

Name:
saturn.par.tuwien.ac.at



Is ready!

Intended use:

1. Develop/debug in lab/own PC
2. Transfer to saturn
3. Run, test, debug, run, benchmark, ...
4. Transfer results back, write-up at own PC, submit...

Available software: emacs, vi, gcc, gdb - standard Linux tools

Pthreads:

```
gcc -Wall -o myprogpt myprogpt.c -O3 -pthread
```

Experiment with
 optimization levels

OpenMP:

```
gcc -Wall -fopenmp -o myprogomp -O3 myprogomp.c
```

BE CAREFUL:

- Do not allocate too much memory (!!) - node may crash/hang
- Make sure processes are killed before exiting

TU Wien parallel computing distributed-memory system

36x2xAMD „**magny cours**“ 8-core Opteron 6134 processors
32GByte main memory per node, 2.3GHz, total number of cores
576, total memory 1152GBytes.

Infiniband QDR switch MT4036

Name:
jupiter.par.tuwien.ac.at



Intended use:

1. Develop/debug on own PC/lab
2. Transfer to jupiter (scp)
3. Run/benchmark
4. Transfer results back, write report

Currently installed: NEC mpi

bash

```
PATH=$PATH`:/opt/NECmpi/gcc/inst/lib64
```

tssh

```
setenv PATH $PATH`:/opt/NECmpi/gc/inst/lib64
```

Compile with

```
mpicc -o mpiprogram mpiprogram.c <all standard gcc options>
```

```
mpicc -help
```

Execute with

```
mpirun -np <number of procs on node> mpiprogram
```

```
mpirun -host jupiter0 -np 5 -host jupiter1 -np 5 ...  
mpiprogram
```

Helpful:

```
setenv MPILX_NODELIST `jupiter0,jupiter1,...`
```

```
mpirun -node 1-33 -nnp 4 mpiprogram
```

BE CAREFUL:

- Start on single node, jupiter0, up to 16 mpi processes
- Gradually extend number of nodes (!!!)
- **NOTE**: currently only 34 nodes (2 will be replaced)

- **NOTE**: installation for multi-node execution needs fix (see [www](#)), currently only single node (jupiter0)

- **WORKAROUND**: jupiter0 is special. It is possible to compile and run multi-node jobs from any other node, but use only nodes jupiter1, jupiter2, ..., jupiter33