

ILSB Computer System

Mid and Large Size Simulations

e.g. ABAQUS

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Prerequisite Knowledge

Following this presentation requires full knowledge of
ILSB Computer System
Information for Students Using the FE-Lab and other
Compute Servers

Some examples are given for the handling of the FEM code ABAQUS
but similarly apply to the use of other simulation programs, too.

For High Computational Demands

to be assigned by course lecturer or thesis supervisor.

- ▶ more powerful hardware
 - ▶ various compute servers
 - ▶ e.g. student
- ▶ more disk space
 - ▶ if home directory quotas are to be exceeded
 - ▶ **while maintaining economic data management!**
 - ▶ to store data until the end of thesis/project
 - ▶ file system studstore
 - ▶ ... ask lecturer/supervisor

Use of Compute Servers

- ▶ login remotely at the server, e.g. student
 - ▶ `ssh -X student`
- ▶ home directory is the same as anywhere else
- ▶ to do simulations
 - ▶ copy input files to `/work/eXXXXXXXX`
 - ▶ run analysis
 - ▶ do post-processing
 - ▶ move results back to your home directory
 - ▶ remove all other files
 - ▶ automatic deletion of files after 4 weeks
- ▶ logout
 - ▶ `exit`

Mid to Large Size FEM Simulations

- ▶ generate input file with preferred pre-processor
- ▶ check required computational resources
 - ▶ for ABAQUS: do a *data check*
 - ▶ look for error and warning messages
 - ▶ look for the required memory (in the .dat file)
 - ▶ select adequate compute server
- ▶ check load on target server
 - ▶ <http://www.ilsb.tuwien.ac.at/status/>
 - ▶ if loaded, consider alternative compute server
- ▶ logon to compute server
 - ▶ transfer the input files to the work disk
 - ▶ ... see 'Use of Compute Servers'

Licenses

- ▶ number of software licenses is limited
- ▶ run a series of job sequential, not in parallel
- ▶ occasional shortage of licenses may be expected for
 - ▶ ABAQUS/CAE (and Viewer)
 - ▶ information is given upon program start
 - ▶ do not run multiple sessions
 - ▶ close program when not needed!
- ▶ check of available licenses
 - ▶ <http://www.ilsb.tuwien.ac.at/status/>
- ▶ before heavy usage of compute servers and licenses
 - ▶ discuss with supervisor
 - ▶ weekly prevision at the ILSB staff meeting

Using Batch Queues

whenever possible, the batch queuing system should be used

- ▶ start ABAQUS from the command line
 - ▶ abaqus
- ▶ follow the script
 - ▶ e.g. do a data check, do an analysis, etc.
 - ▶ terminate a job which turned out to produce useless data
- ▶ select queue – 'long' or 'short' (less than 30min)
- ▶ select number of CPUs (long queue)
 - ▶ discuss with supervisor/lecturer
 - ▶ if an FE-Lab computer is used as server, leave one CPU for desktop applications
- ▶ after queuing the job
 - ▶ job is running in the background
 - ▶ job status is requested by `qstat -a`
 - ▶ after log out the job will continue

Maintaining Economic Data Management

- ▶ remove all files which are no longer needed
- ▶ keep only useful input and result files
- ▶ restrict result data written to the output database
 - ▶ selection of variables
 - ▶ selection of node sets, element sets
 - ▶ frequency (of increments for non-linear simulations)
 - ▶ combinations, e.g.
 - ▶ some solution relevant data with high frequency
 - ▶ more general data only for the final increment
- ▶ ...
- ▶ files should have headers!
 - ▶ which can be understood a few months later, too

Summary

- ▶ distinguish between
 - ▶ compute server
 - ▶ terminal
 - ▶ data (disk)
- ▶ clear work disk directory after simulation
 - ▶ yours only!
- ▶ reduce stored data