

# ILSB Computer System

## Mid and Large Size Simulations

e.g. ABAQUS

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2015 11 17

# 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