

# CSC Quick Reference

## Getting help

- **man** *program* (manual pages)
- **apropos** *stuff* (looks for *stuff* in all documentation)
- **lynx**, **firefox** (html browser)
- CSC services: <http://www.csc.fi>
- **module load** *application* (initialize the environment of an *application*)
- **module avail** (list applications on current server)
- **module list** (list of loaded applications)
- **module purge** *application* (remove *application* environment)
- FAQ: <http://www.csc.fi/english/customers/faq>

## Unix commands

- **ls** (list directory)
- **less** (print a file to the screen)
- **cp** (copy a file)
- **rm** (delete a file)
- **mv** (move or rename a file)
- **cd** (change the current directory)
- **cat** (sends the file to standard output)
- **pwd** (print name of the current directory)
- **mkdir** (create a directory)
- **rmdir** (delete a directory)
- **exit** (quit the session)
- **passwd** (change password)
- **history** (list all commands given previously)
- **!stuff** (executes the last command that started with "*stuff*")
- **head** *nobel.tex* (list ten first lines of the file *nobel.tex*)
- **tail -100** *nobel.tex* (list the last hundred lines of the file *nobel.tex*)
- **tail -f** *nobel.tex* (keeps listing the end of file *nobel.tex*. Handy for following an output file when lines are appended to it.)
- **grep** *stuff nobel.tex* (print lines containing the word *stuff* from the file *nobel.tex*)
- **ls -la > file** (output of a command to a file)
- **ls -la | grep "nobel"** (Chaining (piping) multiple commands)
- **tar cvf** *nob.tar nobel.\** (make a tar-file *nob.tar* from all files whose names begin with *nobel* You can also tar a directory.)
- **tar xvf** *nob.tar* (extract all files from the tar-archive *nob.tar*)
- **gzip** *nob.tar* (compress file *nob.tar* to save space)
- **gunzip** *nob.tar.gz* (uncompress file *nob.tar.gz*)

## File Transfer

- **scp** *computer1:file1 computer2:file2* (copy files from *computer1* to *computer2*)
- An example of **scp** usage:
- **scp** *nobel.tex laureate@top.univ.fi:* (copies the file *nobel.tex* (from current directory (see **pwd** above) to machine *top.univ.fi*) Because the directory in the target machine was not specified the file goes to the home directory of user *laureate*.)
- Most ssh-clients also have a graphical file transfer program available.
- Files can be copied also using the web browser via the Scientist's Interface: <https://sui.csc.fi>

## Networking

- **ssh** *computer* (open a new secure session)
- In Linux use **ssh -X** *computer* or **ssh -Y** *computer* to enable X-connection
- In Windows to enable graphical X-windowing choose "Forward X11" from your ssh-program settings
- In Windows you will also need a separate X-emulator program, e.g. Xming
- **dos2unix** changes Windows (DOS) format text files into Unix-format.

## Command Line Shell

- tcsh is CSC's standard command shell with advanced command-line editing
- Up and down arrow keys recall old command lines
- [Ctrl]-d is the end-of-file character on Unix systems
- [Ctrl]-d or the tab key lists possible choice while you write a file name or a command name
- [Ctrl]-z moves the current program or command to the background, e.g. goes from gnuplot to command prompt
- **bg** (makes the current job in the background to continue execution)
- **fg** (brings a job to the foreground)

## Paging With less

- **less** *file* (print a file to the screen)
- **Is -la | less** (page the output of a command)
- [return] (next line)
- [space] (next screen)
- **b** (previous screen)
- **/stuff** [enter] looks for the next occurrence of "stuff"
- **h** (list the commands of less)
- **q** (quit the less program)

## Emacs Editor

- **emacs** *file* (start the emacs editor)
- **emacs -nw** *file* (emacs without X-windows)
- Notation [Ctrl]-c means: "hold down the Control key and press the c key"
- Moving: cursor keys and page up/down keys
- [Ctrl]-x [Ctrl]-c (quit and save)
- [Ctrl]-x [Ctrl]-s (save)
- [Ctrl]-g (interrupt an emacs command if you get stuck in the minibuffer)
- [Ctrl]-h [Ctrl]-h (Emacs help system)
- Other text editors are e.g. **nano**, and **vi**

## File Storage Areas

- **\$HOME** User's home directory. Shared between machines, not available on compute nodes, regular backups.
- **\$TMPDIR** Temporary directory. Local on each machine, old files are removed, no backup.
- **\$WRKDIR** Temporary directory. Local on each machine, good place for large scratch files, old files may be removed, check server policy, no backup.
- **\$METAWRK** Temporary directory. Shared between machines (except Murska and Louhi *compute nodes*), no backup.
- **\$ARCHIVE** Archive server. Long term storage: Save only large files here. Use the **tar** and **gzip** commands to make one file of your directory before copying here. Recommended single file size: 100MB - 300GB. Shared between machines, files are kept during customership, within backup.
- **\$USERAPPL** Directory to keep your executables. Local to each machine, is visible to compute nodes and is within backup service.
- Project directory. Can be requested from User manager by project leader. Within backup service.
- <http://www.csc.fi/english/research/datastorage/locations>

## Computers

- [louhi.csc.fi](http://louhi.csc.fi) (Cray XT4/5 supercomputer for massively parallel jobs)
- [murska.csc.fi](http://murska.csc.fi) (HP AMD64 supercluster for serial and parallel jobs)
- [vuori.csc.fi](http://vuori.csc.fi) (HP AMD64 supercluster for serial and parallel jobs)
- [hippu.csc.fi](http://hippu.csc.fi) (HP AMD64 cluster for interactive)
- [http://www.csc.fi/english/csc/scientific\\_computing/CSCserves/servers](http://www.csc.fi/english/csc/scientific_computing/CSCserves/servers)

## Program Development

- Compilers on CSC machines (Fortran, C):
- Portland Group (PGI), Pathscale, GNU, Intel
- Environment is different on different servers, check the server pages (see above)
- use the **module** command to check the version and to load the environment. It will also put libraries in the path.
- An example of compiling a program with **gcc**
- **module load PrgEnv-gnu/4.2.4**
- **cc -o prog -fast prog.c**
- Run the program: **./prog**

## System Status

- **saldo** (show CPU quota)
- **quota -v** (disk quota)
- **ps** (process status)
- **top** (continuous process status)
- **uptime** (show the load of the computer, in Hippiu, you can use **huptime**)
- **who** (list logged-in users)
- **finger user** (gives information about *user*)
- **df -kh** (disk status in human readable units)
- **du -kh** (disk space used by a directory)
- **bsub, bjobs, bkill** (submit, get status of, and cancel batch jobs in Murska)
- **sbatch, squeue, scancel** (same on Vuori)
- **qsub, qstat, qdel** (same on Louhi). Note that Hippiu has no batch queue.
- A graphical presentation of the server usage with history: <http://serverstatus.csc.fi>

## How to contact CSC

- CSC www-homepage: <http://www.csc.fi>
- Address: CSC - IT Center for Science Ltd., P.O.-BOX 405, 02101 Espoo
- Street address: Keilaranta 14, Espoo
- Phone: (09) 457 2001,
- Fax (09) 457 2302
- ServiceDesk (09) 457 2821 between 8:30-16:00 or by email [helpdesk@csc.fi](mailto:helpdesk@csc.fi)
- User accounts and passwords (09) 457 2075 or by email [usermgr@csc.fi](mailto:usermgr@csc.fi)
- New user accounts: [http://www.csc.fi/english/customers/new\\_customer](http://www.csc.fi/english/customers/new_customer)