CSC Quick Reference

Getting help

- **man** *program* (manual pages)
- **apropos** *stuff* (looks for *stuff* in all documentation)
- **firefox** (html browser)
- CSC services for researchers: http://research.csc.fi
- **module load** *application* (initialize the environment of an *application*)
- **module avail** (list applications on current server, **module spider** on Taito)
- **module list** (list of loaded applications)
- **module purge** *application* (remove *application* environment)
- FAQ: https://research.csc.fi/faq-knowledge-base
- General Guide: http://research.csc.fi/csc-guide

Unix commands

- **ls** (list directory)
- **less** (print a file to the screen, quit with **q**)
- **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*.)
- You can also install a graphical file transfer program *e.g.* FileZilla
- **iput** *file* (copies *file* to the iRODS archive)
- **iget** *file* (copies file from iRODS archive to current directory)
- **ils** (shows content of your iRODS archive)
- Files can be copied also using the web browser via the Scientist's User 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 use NoMachine client instead as Windows does not have native support for remote graphics (much better than X-emulators like XMing)
- **dos2unix** changes Windows (DOS) format text files into Unix-format.

Paging With less

- **less** *file* (print a file to the screen)
- **ls -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"*, **n** gives the next, **n** the next, ...
- **h** (list the commands of less)
- **q** (quit the less program)

Computers

- sisu.csc.fi (Cray XC supercomputer for massively parallel jobs)
- taito.csc.fi (HP supercluster for serial and parallel jobs)
- taito-shell.csc.fi (HP supercluster, interactive use)
- http://research.csc.fi/csc-s-servers
- nxkajaani.csc.fi NoMachine gateway to CSC's servers. Some GUIs directly available.

Command Line Shell

- bash 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 foregound)
- [ctrl]-r looks for a matching command from history backwards while typing

File Storage Areas

- **$HOME** User's home directory. Kajaani home is shared by Sisu and Taito and available on compute nodes, regular backups
- **$TMPDIR** Temporary directory. Local on each node, old files are removed, no backup, not available on Sisu compute nodes. Use for compiling code.
- **$WRKDIR** Temporary directory. Local on each machine (except shared on Sisu and Taito), good place for large scratch files, old files may be removed, check server policy, no backup.
- **ARCHIVE** long term storage used via the iRODS commands. Module load irods needed in Vuori, Sisu and Hippu. **ils**: list contents, **iput** *file* copy a file to archive, **iget** *file:* copy a file from archive.
  Save only large files here. Use the **tar** and **gzip** commands to make one file of your directory before copying here. Recommended single file size: 10MB - 300GB. Shared between machines, files are kept during customership, within backup.
- **IDA** long term iRODS storage with flexible sharing and access options. http://avointiede.fi/ida
- **$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://research.csc.fi/csc-guide-directories-and-data-storage-at-csc

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**

Program Development

- Compilers on CSC machines (Fortran, C):
- GNU, Intel, Cray
- 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/5.0.41*
- **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 Hippu, you can use **huptime**)
- **who** (list logged-in users)
- **finger** *user* (gives information about *user*)
- **df -h** (disk status in human readable units)
- **du -hs *** (disk space used by a directories)
- **sbatch, squeue, scancel**
- **sacct –j JOBID** (info about completed jobs)
- A graphical presentation of the server usage with history:
  https://sui.csc.fi/web/guest/host-monitor

How to contact CSC

- User homepage: https://research.csc.fi/
- Address: CSC - IT Center for Science Ltd., P.O.-BOX 405, 02101 Espoo
- Street address: Keilaranta 14, Espoo
- Phone: (09) 457 2001,
- ServiceDesk (09) 457 2821 between 8:30-16:00 or by email *servicedesk@csc.fi*
- Forgotten password: https://sui.csc.fi
- New user accounts: https://research.csc.fi/accounts-and-projects