

CSC

Julia Environment on Taito

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CSC – Finnish expertise in ICT for research, education, culture and public administration

Julia Language

- Julia is high-level, high-performance programming language.
  - Programs compile to efficient native code for multiple platforms via LLVM.
  - Excels at numerical computing: many numeric data types and parallelism are supported.
- Official web site: https://julialang.org/
- Documentation: https://docs.julialang.org

Julia on Taito

- Julia is available via module system on Taito.
- Current installed versions
  - 0.6.2, compiled with MKL.
  - 1.0.1, pre-compiled binaries with OpenBLAS, MKL isn’t yet supported.
  - DEV, compiled with OpenBLAS.
- New stable releases will be installed when they are available.
- DEV version will be updated once a week.

Installing Packages

- Packages are highly version dependent.
- Personal repositories on users home directory on Taito.

```
$ ~/.julia
```

- Version 0.6.2

```
julia> Pkg.add("package_name")
```

- Version 1.0.1

```
julia> ]
```

```
(v1.0) pkg> add package_name
```

  - Exit from package manager by pressing a backspace key.

Interactive Use on Taito

- On Taito-shell
  - 4 cores and 128 GB memory / user.
  - Jobs started in Taito-shell can run as long as the Taito shell session remains open.
- Or requesting an interactive node directly

```
srun -c 1 -t 00:10:00 --mem=1G --pty julia
```

where `-c` is the number of cores, `-t` time limit in hh:mm:ss, `--mem` minimum memory and `--pty` enables the interactive run, respectively.

Batch Jobs

```
#!/bin/bash -l
#SBATCH -J julia_single
#SBATCH -o output_%j.txt
#SBATCH -e errors_%j.txt
#SBATCH -p test
#SBATCH -t 00:05:00
#SBATCH --ntasks=1
#SBATCH --nodes=1
#SBATCH --mem-per-cpu=1000

module load julia-env/1.0.1
srun julia my_script.jl
```

- All larger jobs should be executed via a batch job system of Taito (SLURM).
- Avoid executing jobs on login nodes [user@taito-login4]$ → all processes have 60 minutes time limit.
- More information, see https://research.csc.fi/taito-batch-jobs

In conclusion

- Julia is available at CSC via module system of Taito.
- Installing packages.
  - 0.6 vs 1.0
- Interactive use on Taito-shell or reserving a node.
- Larger jobs via batch job system of Taito.
- https://research.csc.fi/-/julia-environment
- servicedesk@csc.fi