

# Getting Started with Julia on HPC Clusters

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# Julia Setup

# Julia binaries: Keep it simple.

- Use the regular binaries
  - [juliaup](#) or [julialang.org](#)
- A system module might help you with packages
  - `module avail / module spider julia`
  - `module load julia`
- Generally, no need to compile from source.

# Put the Julia depot on the parallel file system (PFS).

- PFS is often called “scratch”
  - High quotas
  - Writable (also from within compute jobs)
  - No backup of redundant data
- Set **JULIA\_DEPOT\_PATH** environment variable
- Watch out for **automatic deletion**
  - Workaround: touch files periodically

# On heterogeneous clusters, use multiversioning.

- Nodes with different CPU kinds
  - e.g. login and compute nodes
  - re-triggering of package precompilation
- Set **JULIA\_CPU\_TARGET** environment variable
  - `export JULIA_CPU_TARGET="znver3;skylake,clone_all"`
  - `julia -C help`

# **Workflow:**

# **Visual Studio Code**

# Challenges

- Running VS Code on cluster nodes
- Making the Julia extension work

# VS Code on a cluster node via SSH

## Login node

- Press **F1** and run the **Remote-SSH: Open SSH Host...** command.
  - `accountname@perlmutter.nersc.gov`

## Compute node

- SSH ProxyJump
  - might not be possible at all
  - (requires full accounts at NERSC 🙄)



# Use a Julia wrapper for the Julia extension

- [Julia: Executable Path](#) should point to a wrapper script. For Perlmutter:

```
#!/bin/bash
```

```
# Make julia available
```

```
module use /global/common/software/nersc/n9/julia/modules
```

```
module julia
```

```
# Pass on all arguments to julia
```

```
exec julia "${@}"
```

# VS Code on a cluster node via “remote tunnel”

## On the target node

- Download the [code](#) CLI and run
  - `code tunnel --verbose \`  
`--cli-data-dir=$SCRATCH/.code_cli_data_dir`

## Locally

- Press [F1](#) and run the [Remote Tunnels: Connect to Tunnel](#) command.

(also works with NERSC training accounts 😊)

# Workflow: Jupyter

# NERSC Jupyter

- <https://jupyter.nersc.gov/>