

Using VS Code on RCAC Community Clusters

Visual Studio Code (VS Code) is a widely used, lightweight IDE that supports remote development via SSH. This makes it a convenient option for researchers less comfortable with terminal-only editors like Vim, especially when developing code or managing data on RCAC resources.

Steps overview:

1. Install [VS Code](#) locally.
2. Install the [Remote - SSH](#) extension.
3. [Set up SSH keys](#) on your local machine and upload your public key to the cluster
4. Modify your SSH config file (~/.ssh/config) to include the RCAC cluster details
5. [Connect to the RCAC cluster](#) using VS Code's Remote - SSH

SSH keys for password-less login

1. Generate a key pair consisting of a private and a public key (on your local machine)

```
ssh-keygen -t ed25519 -C "USERNAME@cluster.rcac.purdue.edu"  
# copy contents from ~/.ssh/id_ed25519.pub file
```

2A. Copy the public key to the cluster (Mac/Linux)

```
ssh-copy-id -i ~/.ssh/id_ed25519.pub USERNAME@cluster.rcac.purdue.edu  
# enter password and DFA (DUO)
```

2B. If copy command not available (Windows)

```
ssh USERNAME@cluster.rcac.purdue.edu  
# enter password and DFA (DUO)  
echo "<<id-ed22519.pub file contents>>" >> ~/.ssh/authorized_keys  
# append keys file with contents from ~/.ssh/id_ed25519.pub file
```

3. Fix permissions if necessary (on the HPC cluster)

```
chmod 700 ~/.ssh  
chmod 600 ~/.ssh/authorized_keys  
# https://www.rcac.purdue.edu/knowledge/scholar/accounts/login/sshkeys  
# provides guidance for other programs
```

SSH configuration file setup for VSCode

Create or edit your ~/.ssh/config file - add following lines; replace with your boiler ID

```
Host scholar  
HostName scholar-fe02.rcac.purdue.edu  
User purdue.pete  
ServerAliveInterval 60  
ServerAliveCountMax 3
```

*Note: Connect to the same login node each time
to keep your VSCode server consistent and avoid
multiple instances on different nodes*

Recommended Extensions



Remote - SSH

 Microsoft [microsoft.com](#) | ⚡ 29,472,030 | ★★★★☆ (203)

Open any folder on a remote machine using SSH and take advantage of VS Cod...

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Python

 Microsoft [microsoft.com](#) | ⚡ 186,468,836 | ★★★★★ (618)

Python language support with extension access points for IntelliSense (Pylance), ...

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Pylance

 Microsoft [microsoft.com](#) | ⚡ 154,322,846 | ★★★★☆ (263)

A performant, feature-rich language server for Python in VS Code

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Jupyter

 Microsoft [microsoft.com](#) | ⚡ 96,293,723 | ★★★★☆ (340)

Jupyter notebook support, interactive programming and computing that suppor...

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R

REditorSupport | ⚡ 2,807,255 | ★★★★★ (43)

R Extension for Visual Studio Code

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GitLens — Git supercharged

 GitKraken [gitkraken.com](#) | ⚡ 44,269,824 | ★★★★☆ (877)

Supercharge Git within VS Code — Visualize code authorship at a glance via Git ...

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Markdown All in One

Yu Zhang | ⚡ 11,739,030 | ★★★★★ (164)

All you need to write Markdown (keyboard shortcuts, table of contents, auto pre...

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Nextflow

 Nextflow [nextflow.io](#) | ⚡ 46,878 | ★★★★★ (5)

Nextflow language support

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ShellCheck

Timon Wong | ⚡ 1,695,287 | ★★★★★ (42) | ❤ Sponsor

Integrates ShellCheck into VS Code, a linter for Shell scripts.

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YAML

 Red Hat [redhat.com](#) | ⚡ 23,446,598 | ★★★★★ (71)

YAML Language Support by Red Hat, with built-in Kubernetes syntax support

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Running Jupyter Notebooks on VSCode (cluster setup)

```
# First, load the conda module
module load conda

# Create a new environment with the necessary packages
# We include ipykernel so VSCode can communicate with our notebook
conda create -n jupyter-demo python=3.10 numpy pandas ipykernel -y

# Activate the environment
conda activate jupyter-demo
```

Running R code on VSCode (cluster setup)

<pre># First, load the R module module load r/4.4.1 which R # copy the path</pre>	<pre># Append these lines to .bashrc if [["\$TERM_PROGRAM" == "vscode"]]; then module load r/4.4.1 fi</pre>
---	---

```
# add this block to ~/.vscode-server/data/Machine/settings.json
{
  "python.defaultInterpreterPath": "/bin/python"
  "r.rterm.linux": "/copied/path/to/R",
  "r.bracketedPaste": true,
  "r.alwaysUseActiveTerminal": true
}
```