# **Using VS Code on RCAC Community Clusters**

Rosen Center for Advanced Computing

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 <u>VS Code</u> 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

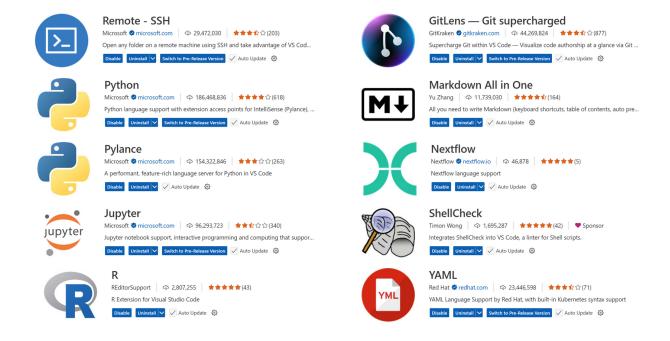
#### Create or edit your ~/.ssh/config file - add following lines; replace with your boiler ID

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**



#### 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)

```
# First, load the R module
module load r/4.4.1
which R
# copy the path

# 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
}
# Append these lines to .bashrc
if [[ "$TERM_PROGRAM" == "vscode" ]]; then
module load r/4.4.1
fi

# add this block to ~/.vscode-server/data/Machine/settings.json
{
    "r.alwaysUseActiveTerminal": true
}
```