

COMP64803: Introduction to Responsible & Reproducible AI

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In the previous lecture

You were supposed to:

- ▶ Pick **5 specific ways** to write better Python (discuss with your supervisor to determine which ones can be crucial to know for your future research)
- ▶ Prepare a **10-min talk** on your selected effective Python ways
- ▶ Give a **live demo or executable code snippets** in a docker environment
- ▶ **Git push your codes** to our course unit repository via pull request (before the lecture)

One quick quiz

What animal is this operator `:=` named after?

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Walrus? Elephant? Warthog?

In this lecture

- ▶ Remote development
- ▶ Computational Shared Facility (CSF)

Remote development (1)

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- ▶ Develop on the same operating system you deploy to or use larger or more specialized hardware.
- ▶ Separate your development environment to avoid impacting your local machine configuration.
- ▶ Make it easy for new contributors to get started and keep everyone on a consistent environment.
- ▶ Use tools or runtimes not available on your local OS or manage multiple versions of them.
- ▶ Access an existing development environment from multiple machines or locations.
- ▶ Debug an application running somewhere else such as a customer site or in the cloud.

Remote development (2)

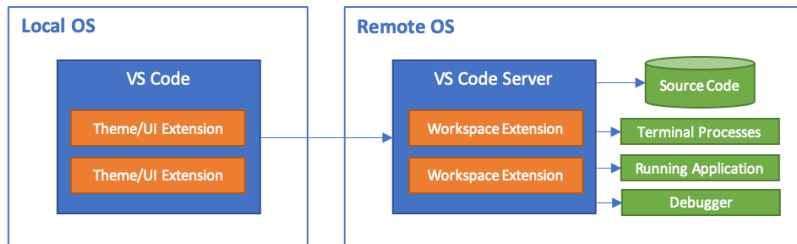
No source code needs to be on your local machine!!!

Remote development (2)

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How does it work?

► VS Code Remote Development



Remote development (3)

VS Code Remote Development

- ▶ **Remote via SSH or dev tunnels**

Connect to remote and virtual machines with Visual Studio Code via SSH.

- ▶ **Develop in Containers**

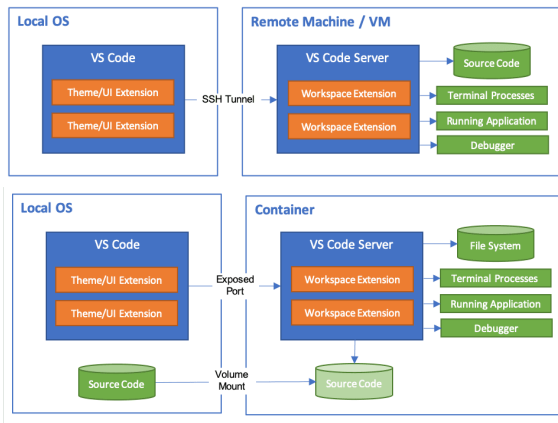
Run Visual Studio Code in a Docker Container.

- ▶ **Work in WSL** (if on Windows machine)

Run Visual Studio Code in Windows Subsystem for Linux (WSL).

VS code remote development

Remote via SSH or dev tunnels **vs** *Develop in Containers*

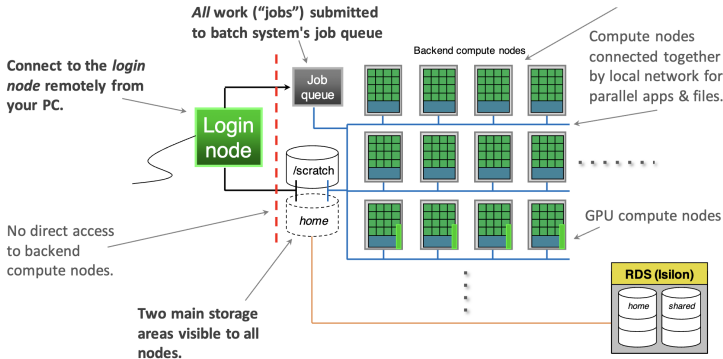


The 1st Lab sessions:

- ▶ Remote development over SSH
- ▶ Dev Containers tutorial

What is the CSF?(more details)

- **Computational Shared Facility**
- A *batch* compute *cluster* to run your "jobs" (simulations, analysis,...)
- Here are the main components you'll learn about: 100s of compute nodes



2

Computational Shared Facility (2)

Currently: **CSF3 (GPU cluster)** an **CSF4 (CPU cluster)**

- ▶ A large Linux cluster system
- ▶ 8,644 CPU cores (all Intel Xeon CPUs)
- ▶ 100 GPUS (68 Nvidia V100s + 32 Nvidia A100s)
- ▶ Can access 2 V100s (and, maybe, 1 more A100) at one time

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Soon (really???), we'll have a new cluster

- ▶ 40 Nvidia H100 GPUs (ultimate target number is 200)
- ▶ Full support of docker
- ▶ Kubernetes (K8s) for automating deployment, scaling, and management of containerized applications.

Cloud computing (pilot phase): I've added your supervisors to the Teams channel

Computational Shared Facility (3)

The 2nd and 3rd Lab sessions: Use VS code remote development to finish the following practicals:

- ▶ Practical 1: Using ssh to connect to the CSF, running some basic commands

Link to [Practical 1](#)

- ▶ Practical 2: Using SGE to submit a serial job

Link to [Practical 2](#)

- ▶ Practical 3: File transfer

Link to [Practical 3](#)

For the Hackthon

Hackthon projects (3 days):

- ▶ To team up: up to 3 members for each group
- ▶ To create a project page at Team Project and include the following:
 - ▶ Team composition and task split
 - ▶ Project idea (no need to be research but should be relevant to decision-making in complex systems)
 - ▶ Grant support (up to £1K GBP): submit your budget request by 31-Jan-2025
- ▶ One dedicated workstation: 2 x Nvidia RTX 4090 (24GB) cards
 - ▶ Remote development: Ubuntu system, docker supported
- ▶ Winning team: a special award and certificate

END LECTURE