Participant preparation guide

Kubernetes foundations and Helm charts

ADASS XXXVI • Two Tutorials • Four hours in total

This guide explains what to prepare before attending. You will use a pre-configured Debian virtual machine (VM) containing a local Kubernetes cluster (K3s), kubectl and Helm. You do not need to install Kubernetes or Helm on your own computer.

1. What you will do

- Session 1 — Kubernetes foundations: inspect a cluster; work with YAML; deploy an application; explore Pods, Deployments, Services, Ingress, ConfigMaps and persistent storage.
- Session 2 — Helm: inspect a chart; configure values; render templates; install and upgrade a release; inspect history; roll back and clean up.

2. What you need

- A laptop that you can use during the workshop, with permission to install and run QEMU.
- A power supply and reliable internet access to download the VM image and workshop materials.
- Recommended host resources: at least 8 GB RAM and around 10 GB free disk space. The VM is configured to use 4 GB RAM.
- The workshop VM image and participant login details. The organisers will provide these separately.
- Basic familiarity with a terminal or command prompt. Previous Kubernetes or Helm experience is not required.

3. Install QEMU

QEMU runs the supplied Linux VM on your laptop. Install the version for your operating system.

macOS

If you use Homebrew, open Terminal and run:

```
brew install qemu
```

Verify the installation:

```
qemu-system-x86_64 --version
```

Windows

Install the Windows build of QEMU from the official QEMU download page or a trusted package manager. Ensure the QEMU installation folder is on PATH, then open PowerShell and run:

```
qemu-system-x86_64 --version
```

Linux (Debian/Ubuntu)

```
sudo apt update
sudo apt install qemu-system-x86
qemu-system-x86_64 --version
```

4. Download and start the workshop VM

Download the VM image from the location supplied by the organisers. Save it somewhere easy to find, such as Downloads. Do not rename it unless instructed. Replace WORKSHOP-VM.qcow2 below with the exact filename you downloaded.

VM image is: https://cloud.datacentral.org.au/teamdata/dc-admin/public/adass-tut-vm.qcow2

macOS

```
qemu-system-x86_64 \
  -m 4G \
  -nic user,model=virtio \
  -name "ADASS Tutorial VM" \
  -drive media=disk,if=virtio,file="$HOME/Downloads/WORKSHOP-VM.qcow2" \
  -display cocoa,zoom-to-fit=on,show-cursor=on
```

Linux

```
qemu-system-x86_64 \
  -m 4G \
  -nic user,model=virtio \
  -name "ADASS Tutorial VM" \
  -drive media=disk,if=virtio,file="$HOME/Downloads/WORKSHOP-VM.qcow2"
```

Windows PowerShell

```
& "C:\Program Files\qemu\qemu-system-x86_64.exe" `
  -m 4G `
  -nic user,model=virtio `
  -name "ADASS Tutorial VM" `
  -drive "media=disk,if=virtio,file=C:\path\to\WORKSHOP-VM.qcow2"
```

On Windows, adjust the QEMU executable path and VM image path to match your installation. On all platforms, wait for Debian to boot and log in using the participant username and password supplied by the organisers. Password characters are not displayed while typing; this is normal.

5. Check that the environment is ready

After logging in to the VM, open a terminal and run:

```
whoami
kubectl version --client
kubectl get nodes
```

```
kubectl get pods -A
helm version
```

The first command should show your participant username. The Kubernetes node should report Ready, and Helm should print its version. Some system Pods may take a short time to become ready after the VM first boots.

6. Workshop materials and repositories

The tutorial repository location and instructions:

https://dev.aao.org.au/mrunmayi.deshpande/adass26-tutorial/-/tree/main?ref_type=heads

.Follow those instructions rather than guessing a repository URL. If access requires an account, check that you can sign in before the workshop.

You do not need to install kubectl, Helm, Docker or a separate Kubernetes cluster on your host laptop; the supplied VM is intended to provide the workshop environment.

7. Useful tips during the workshop

- Use the participant account for exercises. Do not use the root account unless an organiser asks you to.
- Copy commands carefully and replace placeholders such as <pod-name> with the actual name returned by kubectl.
- Keep the VM running during the practical session and shut it down cleanly when finished.
- If the QEMU display is difficult to use, tell an organiser. The command-line exercises can be completed in the VM terminal.
- Do not put personal passwords, API tokens or private credentials into tutorial files.

8. Troubleshooting

Problem	What to check
QEMU command not found	Check QEMU is installed and on PATH; reopen the terminal after installation.
VM image not found	Check the filename and full path. The .qcow2 name must match exactly.
Terminal shows a > prompt	The command is incomplete, often due to an unmatched quote. Press Ctrl+C and paste the command again using straight quotes.
kubectl cannot connect	Wait for the VM to finish booting and use the configured participant account.
Node is NotReady or Pods are starting	Wait briefly, then repeat kubectl get nodes and kubectl get pods -A.

9. Before you arrive: checklist

- ☐ QEMU is installed and its version command works.
- ☐ I have downloaded the workshop VM image.
- ☐ The VM starts and I can log in with the participant account.
- ☐ kubectl get nodes shows a Ready node.
- ☐ helm version prints a version.

- ☐ I have the repository and workshop-material access information.

If you cannot complete the setup, bring your laptop and the exact error message. We will help you get ready at the start of the workshop.