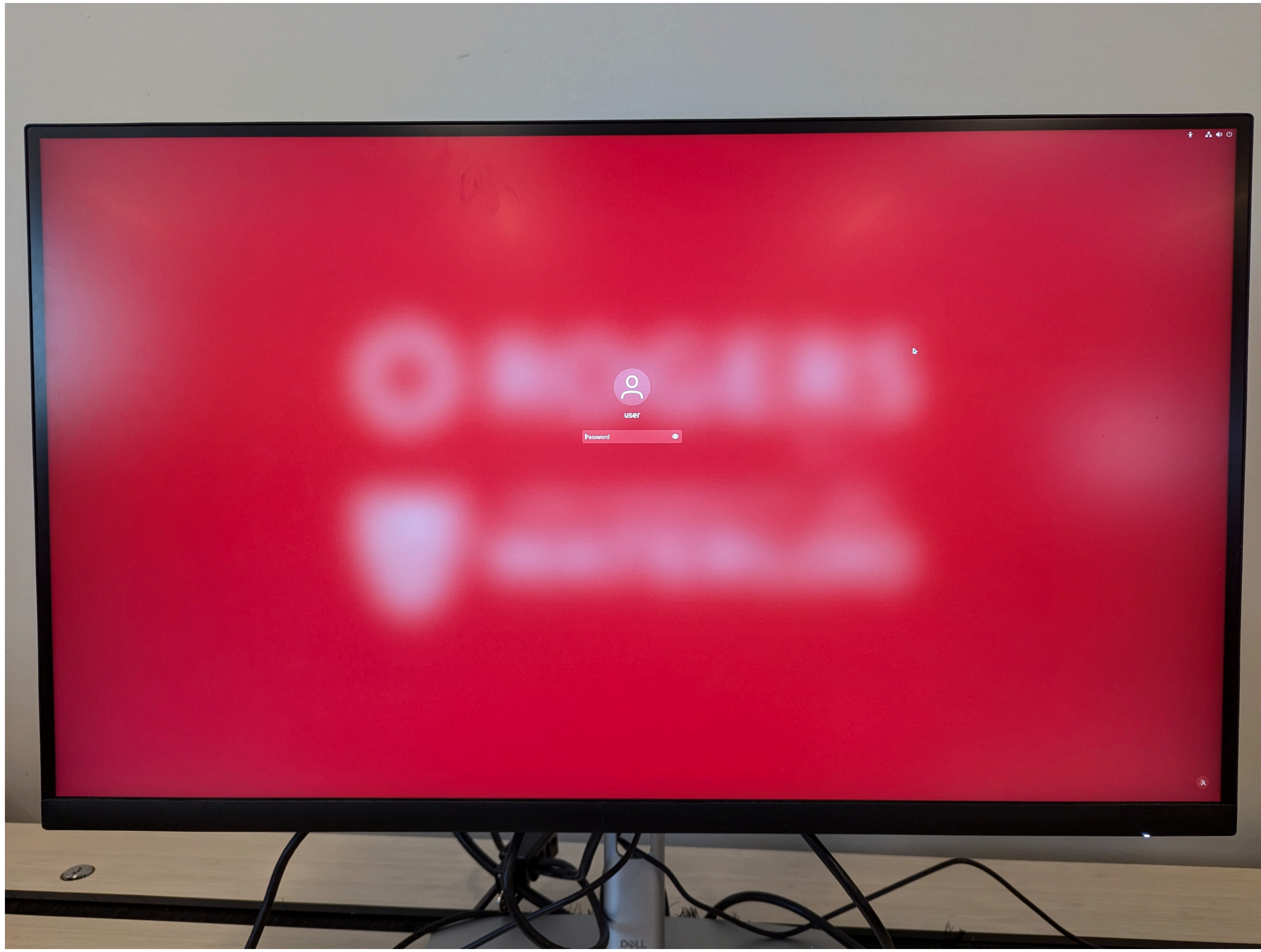
Getting Started with the Workshop (1/5)

1. Acessing your Machine

Each machine runs Ubuntu 22.04 LTS.

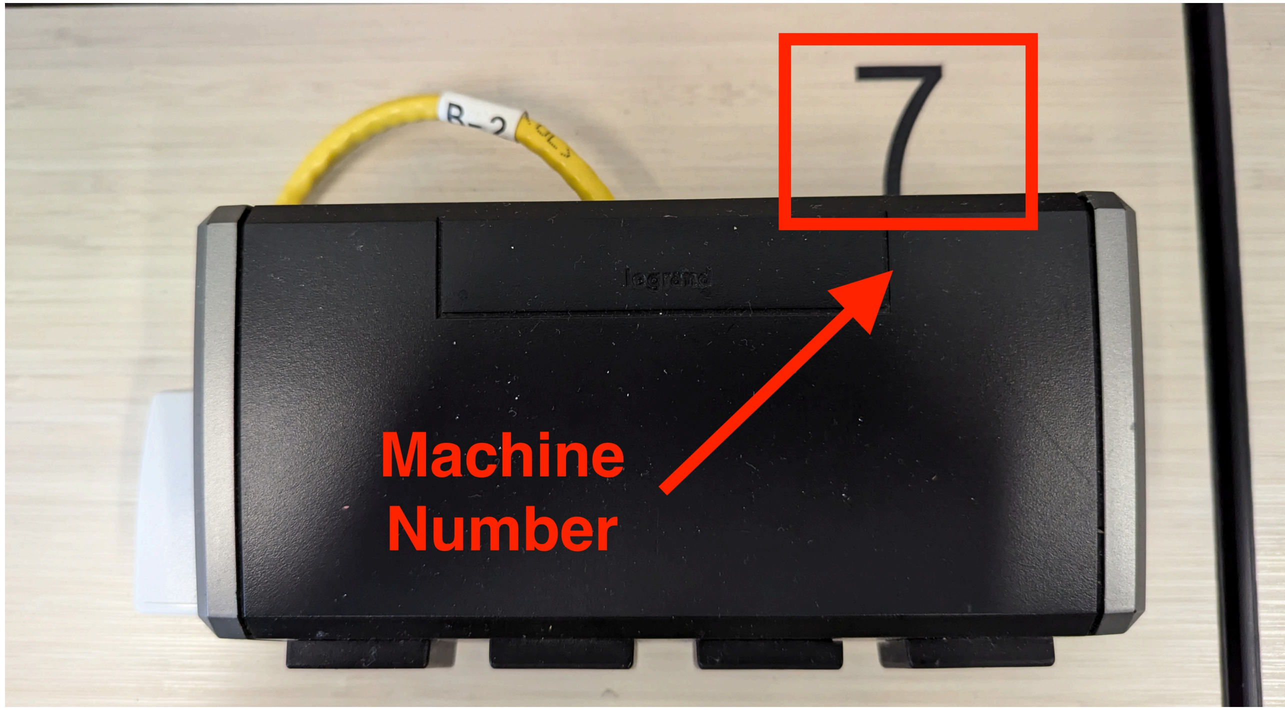
- **Username:** `user`
- **Password:** `user`



Getting Started with the Workshop (2/5)

2. Find your Machine Number

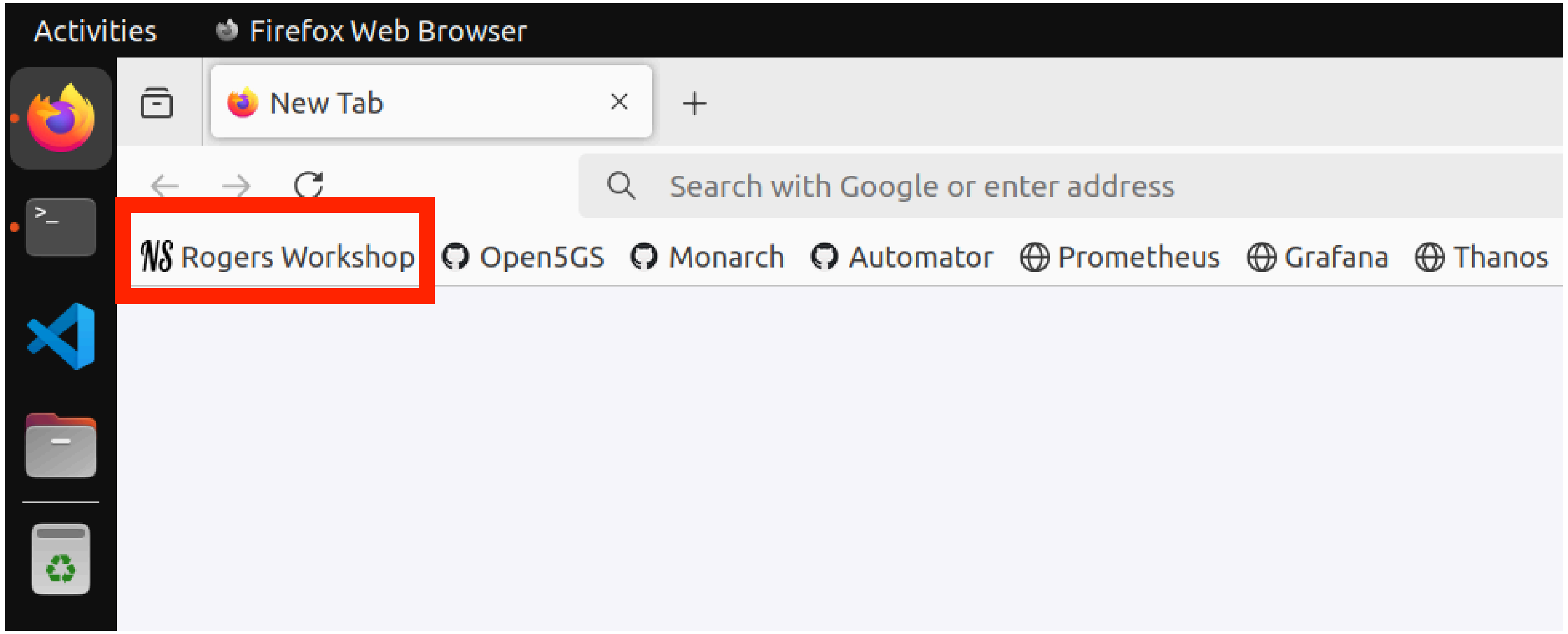
Use the same machine throughout the workshop. Find your machine number on the label behind the power bar.



Getting Started with the Workshop (3/5)

3. Accessing Workshop Resources

- Open **Firefox** and select the **Rogers Workshop** bookmark in the bookmarks bar. This will take you to the workshop landing page, which includes the schedule, slides, source code, and additional resources.



Getting Started with the Workshop (4/5)

4. Navigating to your Home Directory

All workshop files will be stored in your home directory `(~)`. You can quickly navigate to this location from anywhere by typing in the terminal:

```
cd ~
```

5. Downloading the Workshop Code Repositories

Use `git clone` to download the workshop source code. Make sure to run this command from your home directory.

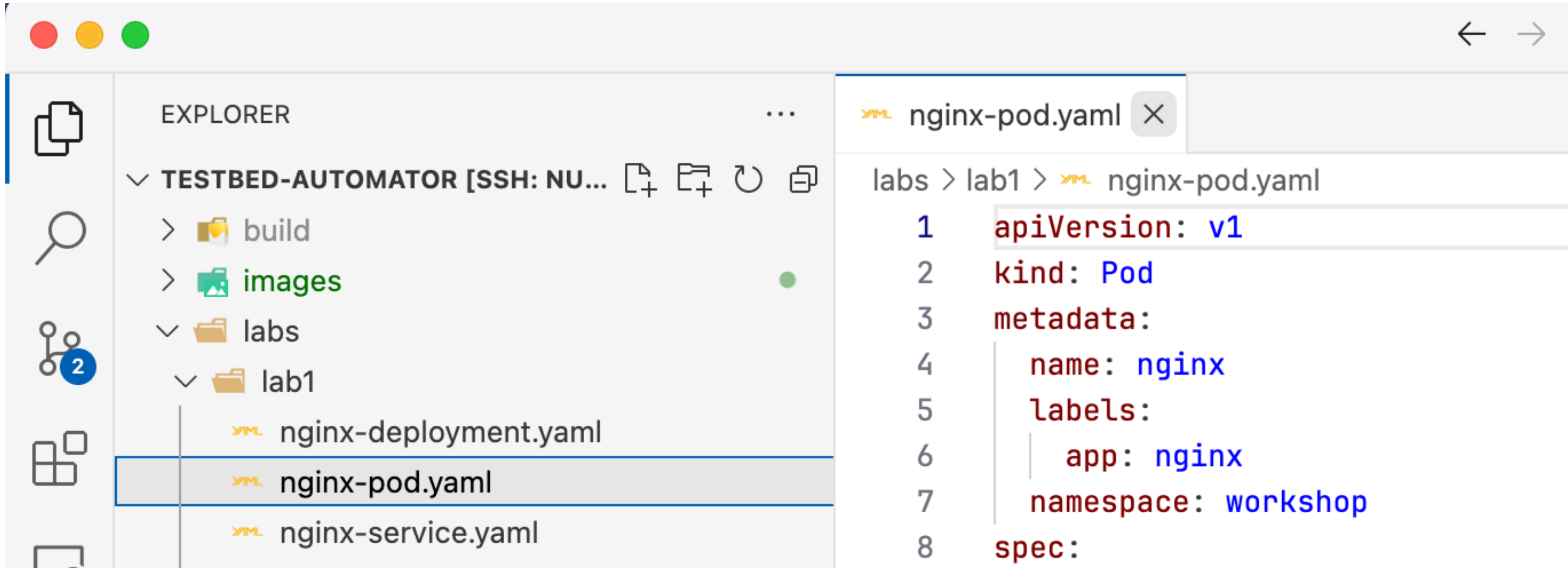
```
cd ~
git clone <repository_url>
```

Getting Started with the Workshop (5/5)

6. Using VS Code to View and Edit Code

Open each repository in the VS Code text editor as we proceed through the workshop. Once you are inside the repo folder in the terminal, you can open it by:

```
code .
```



```
apiVersion: v1
kind: Pod
metadata:
  name: nginx
  labels:
    app: nginx
  namespace: workshop
spec:
```

Ready to Start?

Ask for help if you encounter any issues.

Session Overview

Welcome! In this session, you'll deploy and manage a 5G core network on Kubernetes using Open5GS, an open-source, 3GPP-compliant 5G core with support for network slicing.

Key Activities

- **Kubernetes Setup:** Use the **Testbed Automator** script to initialize your Kubernetes cluster and install essential tools.
- **Core Network Deployment:** Deploy Open5GS with network slicing capabilities.

By the end of this session, you'll have hands-on experience with 5G core deployment, and network slicing.

Testbed Automator Script Overview

Purpose: Automates the setup and configuration of a testbed environment.

Key Tasks

- Install necessary software packages
- Set up Kubernetes and networking tools
- Configure various networking plugins like Flannel, Multus, Open vSwitch (OVS)
- Install storage management systems (OpenEBS)

Technologies and Tools

Kubernetes

- **Kubeadm:** Initializes the Kubernetes cluster.
- **Kubectl:** CLI tool to interact with the Kubernetes cluster.
- **Helm:** Package manager for Kubernetes applications.

Networking

- **Flannel:** Container Network Interface (CNI) for Kubernetes.
- **Multus:** Meta-CNI for deploying multiple network interfaces in containers.
- **Open vSwitch (OVS):** Used for advanced networking and bridge management.

Technologies and Tools (Cont.)

Containerization

- **Containerd:** Container Runtime Interface (CRI) compatible container runtime.
  - A container runtime builds on top of operating system kernel features and improves container management with an abstraction layer.
  - Container runtime interface (CRI) is a plugin interface that lets the kubelet - an agent that runs on every node in a Kubernetes cluster - use more than one type of container runtime.

Storage

- **OpenEBS:** Manages the storage available on each of the Kubernetes nodes and uses that storage to provide Local or Replicated Persistent Volumes to Stateful workloads.

Deploying `testbed-automator`

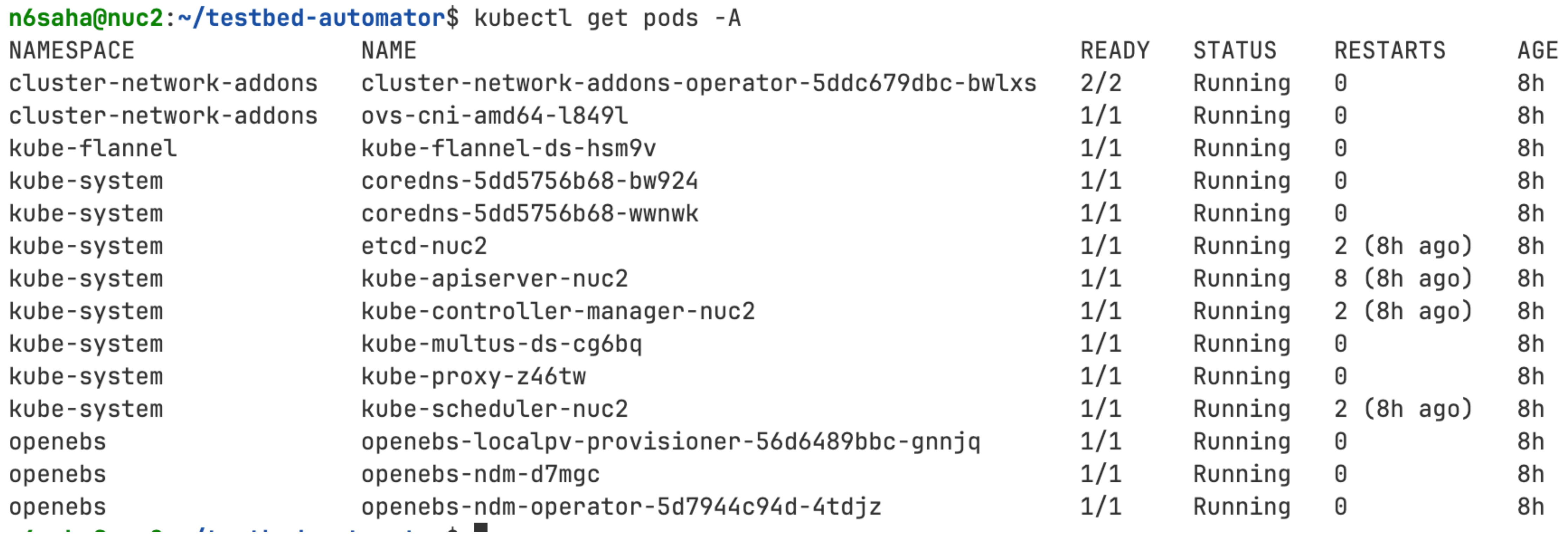
You can use the `install.sh` script as follows:

```
cd ~
git clone https://github.com/niloysh/testbed-automator
cd testbed-automator
./install.sh
```

Note: Do NOT run the `install.sh` script as `sudo` or `root.` Run it as a regular user and provide the password when prompted.

Verify Deployment

On completion, run `kubectl get pods -A` you should see:



```
n6saha@nuc2:~/testbed-automator$ kubectl get pods -A
NAMESPACE                NAME                                                READY   STATUS    RESTARTS      AGE
cluster-network-addons   cluster-network-addons-operator-5ddc679dbc-bwlxs    2/2     Running   0             8h
cluster-network-addons   ovs-cni-amd64-l849l                                 1/1     Running   0             8h
kube-flannel             kube-flannel-ds-hsm9v                               1/1     Running   0             8h
kube-system              coredns-5dd5756b68-bw924                            1/1     Running   0             8h
kube-system              coredns-5dd5756b68-wwnwk                            1/1     Running   0             8h
kube-system              etcd-nuc2                                           1/1     Running   2 (8h ago)    8h
kube-system              kube-apiserver-nuc2                                 1/1     Running   8 (8h ago)    8h
kube-system              kube-controller-manager-nuc2                        1/1     Running   2 (8h ago)    8h
kube-system              kube-multus-ds-cg6bq                                1/1     Running   0             8h
kube-system              kube-proxy-z46tw                                    1/1     Running   0             8h
kube-system              kube-scheduler-nuc2                                 1/1     Running   2 (8h ago)    8h
openebs                  openebs-localpv-provisioner-56d6489bbc-gnnjq        1/1     Running   0             8h
openebs                  openebs-ndm-d7mgc                                   1/1     Running   0             8h
openebs                  openebs-ndm-operator-5d7944c94d-4tdjz               1/1     Running   0             8h
n6saha@nuc2:~/testbed-automator$
```

After confirming deployment, proceed with Lab 1 to deepen your understanding of the tools you've just deployed.