Exercise 9.2: Creating a Persistent NFS Volume (PV)

We will first deploy an NFS server. Once tested we will create a persistent NFS volume for containers to claim.

1. Install the software on your master node.

```
student@lfs458-node-1a0a:~$ sudo apt-get update && sudo \
             apt-get install -y nfs-kernel-server
<output_omitted>
```

2. Make and populate a directory to be shared. Also give it similar permissions to `/tmp/`

```
student@lfs458-node-1a0a:~$ sudo mkdir /opt/sfw

student@lfs458-node-1a0a:~$ sudo chmod 1777 /opt/sfw/

student@lfs458-node-1a0a:~$ sudo bash -c \
               'echo software > /opt/sfw/hello.txt'
```

3. Edit the NFS server file to share out the newly created directory. In this case we will share the directory with all. You can always **snoop** to see the inbound request in a later step and update the file to be more narrow.

```
student@lfs458-node-1a0a:~$ sudo vim /etc/exports
/opt/sfw/ *(rw,sync,no_root_squash,subtree_check)
```

4. Cause `/etc/exports` to be re-read:

```
student@lfs458-node-1a0a:~$ sudo exportfs -ra
```

5. Test by mounting the resource from your **second** node.

```
student@lfs458-node-2b2b:~$ sudo apt-get -y install nfs-common
<output_omitted>

student@lfs458-node-2b2b:~$ showmount -e lfs458-node-1a0a
Export list for lfs458-node-1a0a:
/opt/sfw  *

student@lfs458-node-2b2b:~$ sudo mount 10.128.0.3:/opt/sfw /mnt

student@lfs458-node-2b2b:~$ ls -l /mnt
total 4
-rw-r--r-- 1 root root 9 Sep 28 17:55 hello.txt
```

6. Return to the master node and create a YAML file for the object with `kind`, `PersistentVolume`. Use the hostname of the master server and the directory you created in the previous step. Only syntax is checked, an incorrect name or directory will not generate an error, but a Pod using the resource will not start. Note that the `accessModes` do not currently affect actual access and are typically used as labels instead.

```
student@lfs458-node-1a0a:~$ vim PVol.yaml
```



```
apiVersion: v1
kind: PersistentVolume
metadata:
  name: pvvol-1
spec:
  capacity:
    storage: 1Gi
  accessModes:
    - ReadWriteMany
  persistentVolumeReclaimPolicy: Retain
  nfs:
    path: /opt/sfw
    server: lfs458-node-1a0a   #<-- Edit to match master node
    readOnly: false
```

7. Create the persistent volume, then verify its creation.

```
student@lfs458-node-1a0a:~$ kubectl create -f PVol.yaml
persistentvolume "pvvol-1" created

student@lfs458-node-1a0a:~$ kubectl get pv
NAME      CAPACITY   ACCESSMODES   RECLAIMPOLICY   STATUS
   CLAIM     STORAGECLASS   REASON    AGE
pvvol-1   1Gi        RWX           Retain      Available   4s
```

