Step 1: Download the Ubuntu ISO

First, download the Ubuntu netboot mini ISO pr whatever installed you want on your Dell server:

```
wget -O /var/lib/libvirt/boot/bionic-mini.iso \

http://archive.ubuntu.com/ubuntu/dists/bionic/main/installer-amd64/current/images/netboot/mini.iso
```

Verify the file exists:

```
ls -lh /var/lib/libvirt/boot/
```

Make sure `bionic-mini.iso` is listed.

Step 2: Create the Virtual Machine

Now, create the VM with graphics enabled (VNC):

```
sudo virt-install \
  --virt-type kvm \
  --name bionic \
  --ram 2048 \
  --vcpus 2 \
  --disk path=/var/lib/libvirt/images/bionic.qcow2,size=10,format=qcow2 \
  --cdrom /var/lib/libvirt/boot/bionic-mini.iso \
  --network network=default \
  --os-variant=ubuntu18.04 \
  --graphics vnc,listen=0.0.0.0 \
  --noautoconsole
```

Explanation:

- **VNC enabled** (`--graphics vnc,listen=0.0.0.0`) → Allows you to connect via VNC from your Mac.

- **No autoconsole** (`--noautoconsole`) → Prevents auto-attaching to a text console.

Step 3: Find the VNC Port

Once the VM starts, check which VNC port it's running on:

```
sudo virsh dumpxml bionic | grep vnc
```

Example output:

```
<graphics type='vnc' port='5902' autoport='yes' listen='0.0.0.0'/>
```

This means the VNC server is listening on port **5902**.

Step 4: Connect to VNC from Mac

Since your Dell server has no GUI, use your Mac to connect.

Use a VNC Client

Install:

- **RealVNC Viewer**
- **TigerVNC**

Then, connect using:

```
your-server-ip:5902
```

Step 5: Install Ubuntu (Graphical)

Now, follow the graphical **Ubuntu installation wizard**.

Select Language & Keyboard

- Choose "Install Ubuntu".
- Select **Keyboard Layout** → Default is **English (US)**.

Network Setup

- If prompted, select **Use DHCP** (default).

Choose Disk Partitioning

- Select **"Guided - use entire disk"** (Recommended).
- Select the available disk (should be `/dev/vda` or similar).
- Confirm and select **"Yes"** when asked to write changes.

Create a User Account

- **Username:** `ubuntu`
- **Password:** `<your-password>` (Set a strong one)
- Choose **automatic login** if needed.

Wait for the Installation to Finish

- The installation will take a few minutes.
- Once done, **remove the installation media** when prompted.
- **Click "Reboot Now"**.

Step 6: Prepare Ubuntu for OpenStack

Once the VM reboots, reconnect to it.

Connect via VNC Again

OR Connect via SSH (Recommended)

On your **Dell server**, run:

```
sudo virsh list --all
```

Find the running VM and access it:

```
sudo virsh console bionic
```

Now, login using the credentials you set during installation.

Step 7: Install `cloud-init` and Prepare for OpenStack

Once logged into the VM via **VNC or console**, run on the VM:

```
sudo apt update
sudo apt install -y cloud-init qemu-guest-agent
```

This ensures that OpenStack can configure instances when launched.

Clean Up the VM Before Uploading

```
sudo cloud-init clean
sudo rm -rf /var/log/*
sudo shutdown -h now
```

The VM is now ready to be converted into an OpenStack image.

Step 8: Upload the Image to OpenStack

Now, go **back to your Dell server (SSH)** and upload the image.

Load OpenStack Credentials

```
source openstackrc.sh
```

Upload the Image

```
openstack image create \
  --disk-format qcow2 \
  --container-format bare \
  --file /var/lib/libvirt/images/bionic.qcow2 \
  --property hw_disk_bus=scsi \
  --property hw_scsi_model=virtio-scsi \
  --property os_type=linux \
  "ubuntu-18.04"
```

Verify the upload:

```
openstack image list
```

Step 9: Launch an Instance in OpenStack

Find the Image ID

```
openstack image list | grep ubuntu-18.04
```

Find the Network ID

```
openstack network list
```

Launch the VM in OpenStack

```
openstack server create \
  --flavor m1.small \
  --image ubuntu-18.04 \
  --nic net-id=<NETWORK_ID> \
  --security-group default \
  --key-name my-key \
  ubuntu-test-instance
```

Check if it's running:

```
openstack server list
```

Now your Ubuntu VM is successfully installed and running in OpenStack!