# Virtualization with KVM - Chapter 11

Rocky Linux 9 - Key Commands and Scripts

## 1. Installing and Configuring KVM

Verify Hardware Virtualization Support:

sudo dnf update -y  
egrep -c '(vmx|svm)' /proc/cpuinfo

If output is 0, enable virtualization in BIOS/UEFI:

- Access BIOS/UEFI settings and enable:  
 - 'Intel Virtualization Technology' (Intel CPUs)  
 - 'AMD-V' (AMD CPUs)  
- Save changes and restart system.

Install KVM and Required Packages:

sudo dnf install -y epel-release  
sudo dnf install -y qemu-kvm libvirt virt-install bridge-utils

Enable and Start the libvirtd Service:

sudo systemctl enable --now libvirtd  
sudo systemctl status libvirtd

## 2. Configuring Networking for Virtual Machines

Check Available Network Interfaces:

sudo ip address

Create a Bridge Network:

sudo nmcli connection add type bridge con-name br0 ifname br0  
sudo nmcli connection add type ethernet con-name br0-port1 ifname enp4s0 master br0  
sudo nmcli connection up br0

## 3. Creating a Virtual Machine

Prepare Virtual Machine Storage:

cd Downloads  
sudo mkdir -p /var/lib/libvirt/images  
sudo chmod 755 /var/lib/libvirt/images

Download and Verify Ubuntu ISO:

cd ~/Downloads  
sha256sum ubuntu-24.04.1-desktop-amd64.iso

Create a Virtual Machine with virt-install:

sudo virt-install \  
--name ubuntu24.04 \  
--ram 2048 \  
--vcpus 2 \  
--disk path=/var/lib/libvirt/images/ubuntu24.04.qcow2,size=20 \  
--os-variant ubuntu20.04 \  
--network bridge=br0 \  
--graphics none \  
--cdrom /home/admin/Downloads/ubuntu-24.04.1-desktop-amd64.iso

## 4. Managing Virtual Machines

Shutdown and Clone a VM:

sudo virsh shutdown ubuntu24.04  
sudo virsh destroy ubuntu24.04  
sudo virt-clone --original ubuntu24.04 --name ubuntu24-clone --file /var/lib/libvirt/images/ubuntu24-clone.qcow2  
sudo virsh start ubuntu24-clone

Taking and Restoring Snapshots:

sudo virsh snapshot-create-as ubuntu24.04 snapshot1 'Initial setup snapshot'  
sudo virsh snapshot-list ubuntu24.04  
sudo virsh snapshot-revert ubuntu24.04 snapshot1

## 5. Monitoring Virtual Machines

Check Running Virtual Machines:

sudo virsh list --all

Monitor Resource Usage:

sudo virt-top  
sudo virsh domstats ubuntu24.04

## 6. Setting Up AWS EC2 and Hybrid Cloud

Install AWS CLI on Rocky Linux:

sudo dnf install python3-pip -y  
pip3 install awscli --upgrade --user

Launch an EC2 Instance via AWS CLI:

aws ec2 run-instances --image-id ami-12345678 --count 1 --instance-type t2.micro --key-name MyKeyPair --security-groups MySecurityGroup

Connect to an EC2 Instance:

ssh -i ~/.ssh/my-ec2-key.pem ec2-user@<EC2\_PUBLIC\_IP>

Sync Data with AWS S3:

aws s3 cp /local/path/to/file s3://my-s3-bucket/  
aws s3 sync /local/folder s3://my-s3-bucket/backup/