How to Install and Configure KVM on Ubuntu 18.04 LTS Server

Pradeep Kumar / December 23, 2019

KVM (Kernel-based Virtual Machine) is an open source full virtualization solution for Linux like systems, KVM provides virtualization functionality using the virtualization extensions like **Intel VT** or **AMD-V**. Whenever we install KVM on any linux box then it turns it into the hyervisor by loading the kernel modules like **kvm-intel.ko**(for intel based machines) and **kvm-amd.ko** (for amd based machines).

KVM allows us to install and run multiple virtual machines (Windows & Linux). We can create and manage KVM based virtual machines either via **virt-manager** graphical user interface or **virt-install** & **virsh** cli commands.

In this article we will discuss how to install and configure **KVM hypervisor** on Ubuntu 18.04 LTS server. I am assuming you have already installed Ubuntu 18.04 LTS server on your system. Login to your server and perform the following steps.

Step:1 Verify Whether your system support hardware virtualization

Execute below egrep command to verify whether your system supports hardware virtualization or not,

```
linuxtechi@kvm-ubuntu18-04:~$ egrep -c '(vmx|svm)' /proc/cpuinfo
1
linuxtechi@kvm-ubuntu18-04:~$
```

Now Install "**kvm-ok**" utility using below command, it is used to determine if your server is capable of running hardware accelerated KVM virtual machines

```
linuxtechi@kvm-ubuntu18-04:~$ sudo apt install cpu-checker
```

Run kvm-ok command and verify the output,

```
linuxtechi@kvm-ubuntu18-04:~$ sudo kvm-ok
INFO: /dev/kvm exists
KVM acceleration can be used
linuxtechi@kvm-ubuntu18-04:~$
```

Step:2 Install KVM and its required packages

Run the below apt commands to install KVM and its dependencies

```
linuxtechi@kvm-ubuntu18-04:~$ sudo apt update
linuxtechi@kvm-ubuntu18-04:~$ sudo apt install qemu qemu-kvm libvirt-bin
bridge-utils  virt-manager
```

Once the above packages are installed successfully, then your local user (In my case linuxtechi) will be added to the group libvirtd automatically.

Step:3 Start & enable libvirtd service

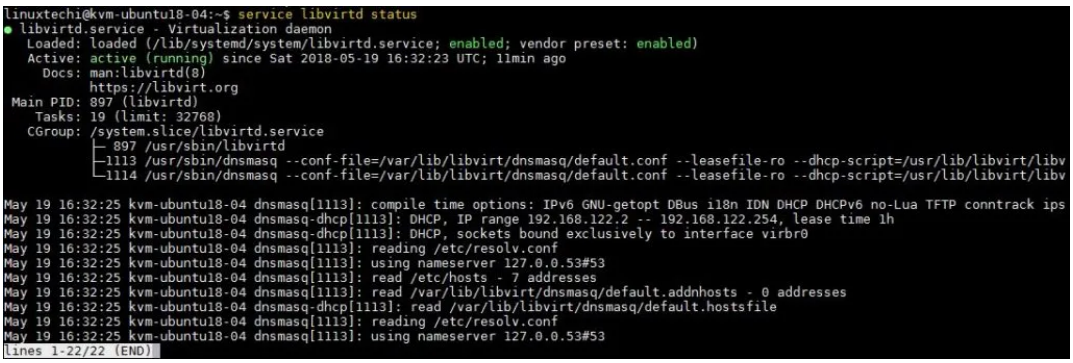
Whenever we install qemu & libvirtd packages in Ubuntu 18.04 Server then it will automatically start and enable libvirtd service, In case libvirtd service is not started and enabled then run beneath commands,

```
linuxtechi@kvm-ubuntu18-04:~$ sudo service libvirtd start
linuxtechi@kvm-ubuntu18-04:~$ sudo update-rc.d libvirtd enable
```

Now verify the status of libvirtd service using below command,

```
linuxtechi@kvm-ubuntu18-04:~$ service libvirtd status
```

Output would be something like below:



Step:4 Configure Network Bridge for KVM virtual Machines

Network bridge is required to access the KVM based virtual machines outside the KVM hypervisor or host. In Ubuntu 18.04, network is managed by netplan utility, whenever we freshly installed Ubuntu 18.04 server then netplan file is created under **/etc/netplan/.** In most of the hardware and virtualized environment, netplan file name would be "**50-cloud-init.yaml**" or "**01-netcfg.yaml",** to configure static IP and bridge, netplan utility will refer this file.

As of now I have already configured the static IP via this file and content of this file is below:

```
network:
    ethernets:
        ens33:
            addresses: [192.168.0.51/24]
            gateway4: 192.168.0.1
            nameservers:
              addresses: [192.168.0.1]
            dhcp4: no
            optional: true
    version: 2
```

Let's add the network bridge definition in this file,

```
linuxtechi@kvm-ubuntu18-04:~$ sudo vi /etc/netplan/50-cloud-init.yaml
```

```
network:
  version: 2
```

```
      dhcp6: no


  bridges:
    br0:
      interfaces: [ens33]
      dhcp4: no
      addresses: [192.168.0.51/24]
      gateway4: 192.168.0.1
      nameservers:
        addresses: [192.168.0.1]
```

As you can see we have removed the IP address from interface(ens33) and add the same IP to the bridge '**br0**' and also added interface (ens33) to the bridge br0. Apply these changes using below netplan command,

```
linuxtechi@kvm-ubuntu18-04:~$ sudo netplan apply
linuxtechi@kvm-ubuntu18-04:~$
```

If you want to see the debug logs then use the below command,

```
linuxtechi@kvm-ubuntu18-04:~$ sudo netplan --debug  apply
```

Now Verify the bridge status using following methods:

```
linuxtechi@kvm-ubuntu18-04:~$ sudo networkctl status -a
```

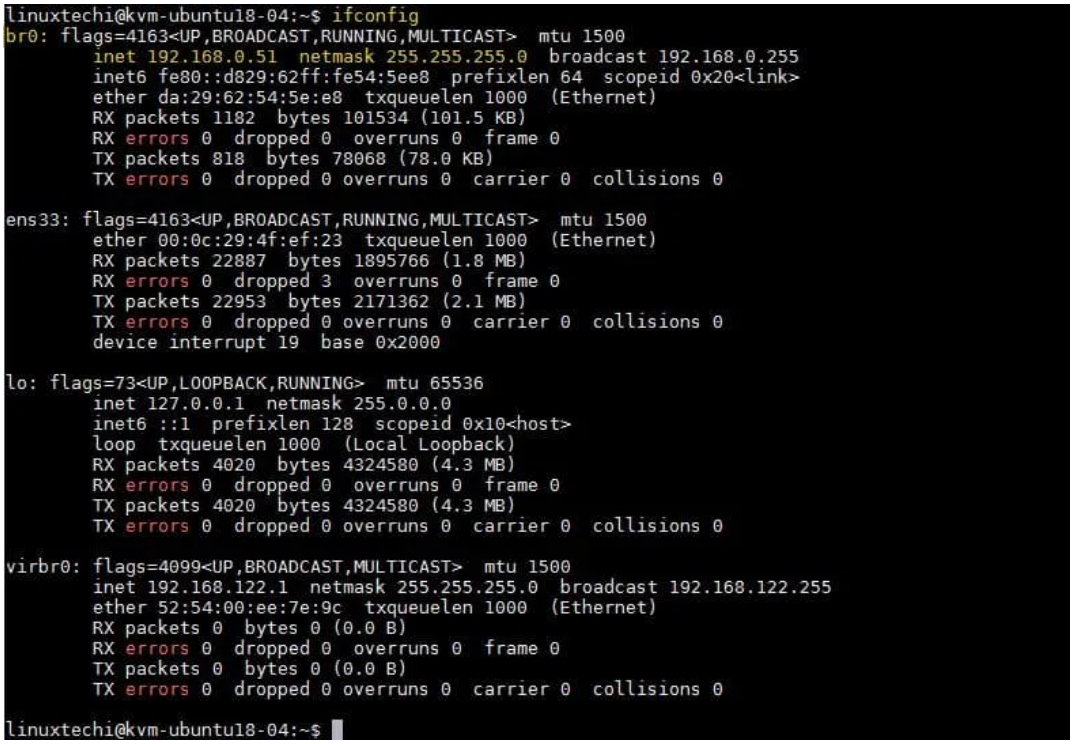
```
   Network File: /run/systemd/network/10-netplan-ens33.network
           Type: ether
          State: carrier (configured)
           Path: pci-0000:02:01.0
         Driver: pcnet32
         Vendor: Advanced Micro Devices, Inc. [AMD]
          Model: 79c970 [PCnet32 LANCE] (PCnet - Fast 79C971)
     HW Address: 00:0c:29:4f:ef:23 (VMware, Inc.)

● 4: virbr0
      Link File: /lib/systemd/network/99-default.link
   Network File: n/a
           Type: ether
          State: no-carrier (unmanaged)
         Driver: bridge
     HW Address: 52:54:00:ee:7e:9c
        Address: 192.168.122.1

● 5: virbr0-nic
      Link File: /lib/systemd/network/99-default.link
   Network File: n/a
           Type: ether
          State: off (unmanaged)
         Driver: tun
     HW Address: 52:54:00:ee:7e:9c

● 8: br0
      Link File: /lib/systemd/network/99-default.link
   Network File: /run/systemd/network/10-netplan-br0.network
           Type: ether
          State: routable (configured)
         Driver: bridge
     HW Address: da:29:62:54:5e:e8
        Address: 192.168.0.51
                 fe80::d829:62ff:fe54:5ee8
        Gateway: 192.168.0.1
```

```
linuxtechi@kvm-ubuntu18-04:~$ ifconfig
```



Start:5 Creating Virtual machine (virt-manager or virt-install command)

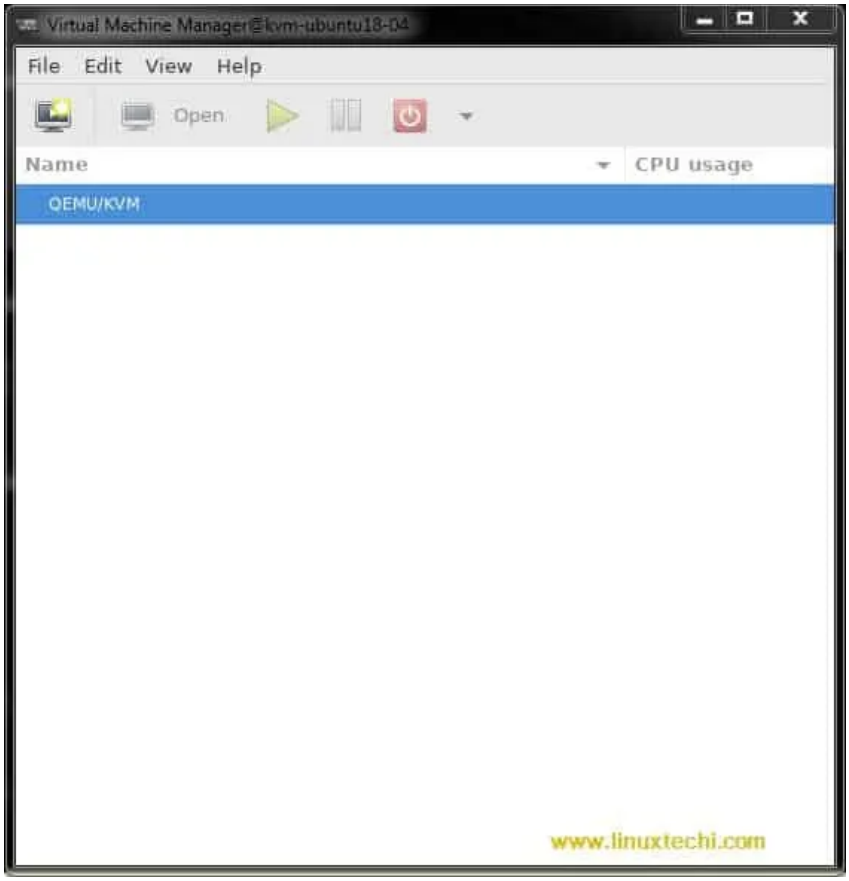
There are two ways to create virtual machine:

- virt-manager (GUI utility)
- virt-install command (cli utility)

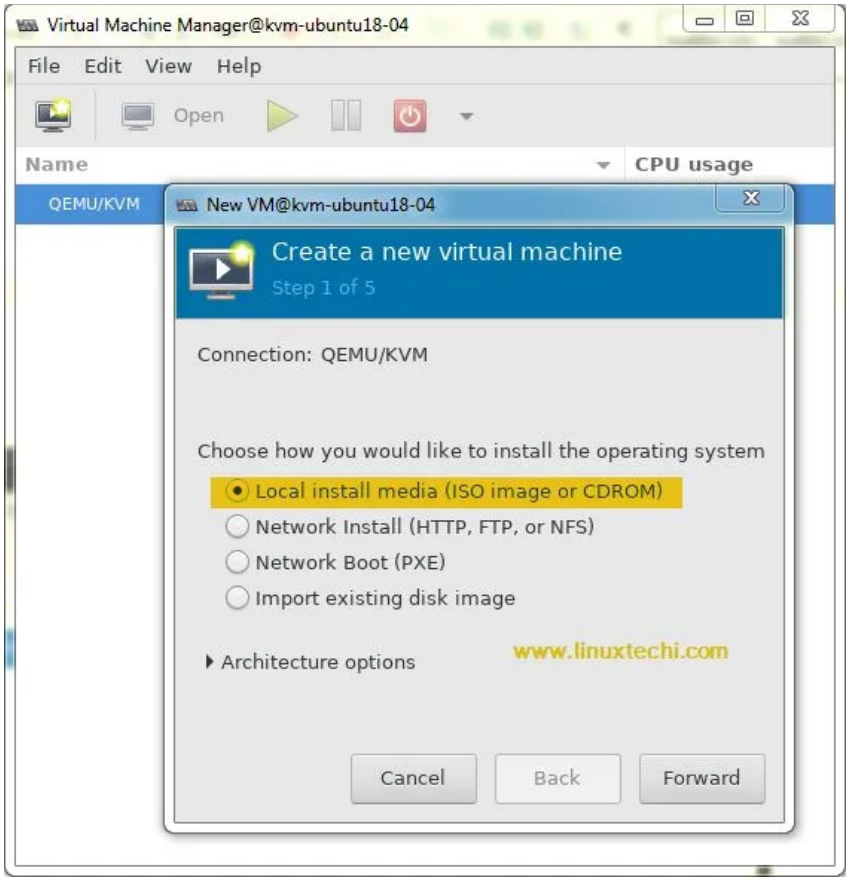
Creating Virtual machine using virt-manager:

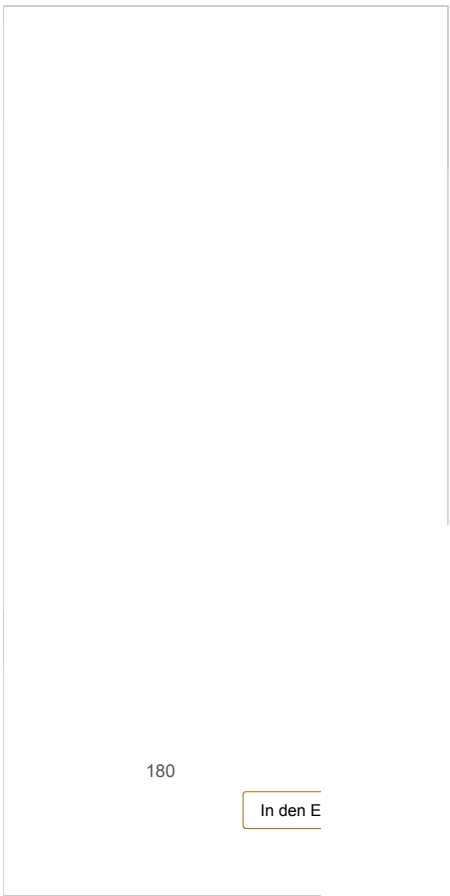
Start the virt-manager by executing the beneath command,

```
linuxtechi@kvm-ubuntu18-04:~$ sudo virt-manager
```

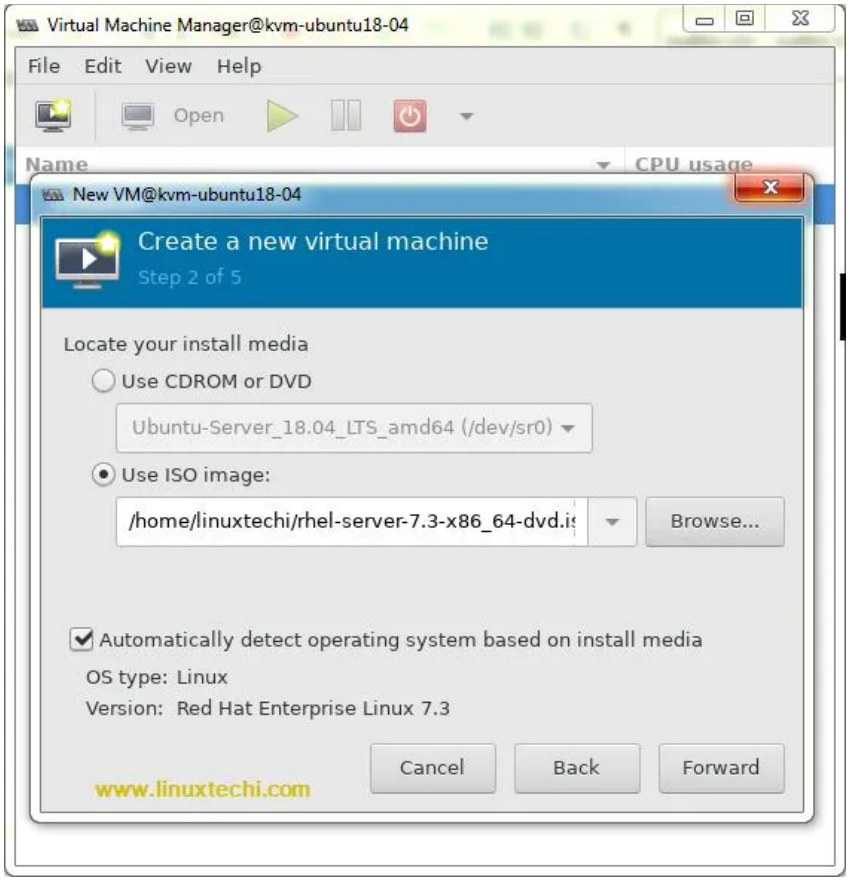


Create a new virtual machine





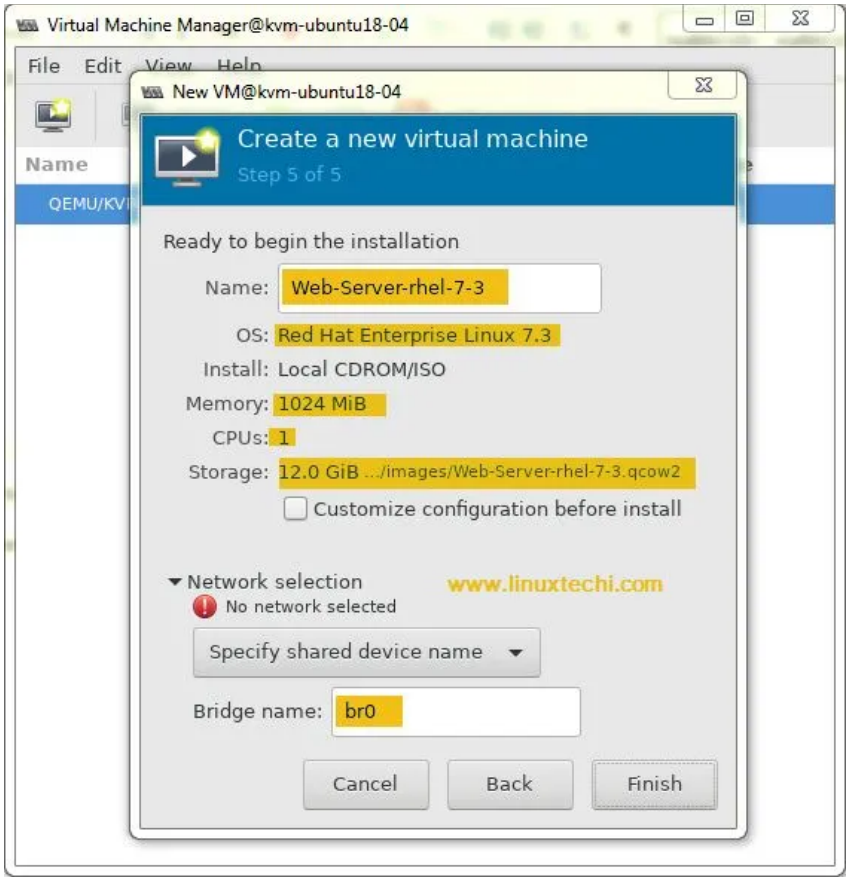
Click on forward and select the ISO file, in my case I am using RHEL 7.3 iso file.



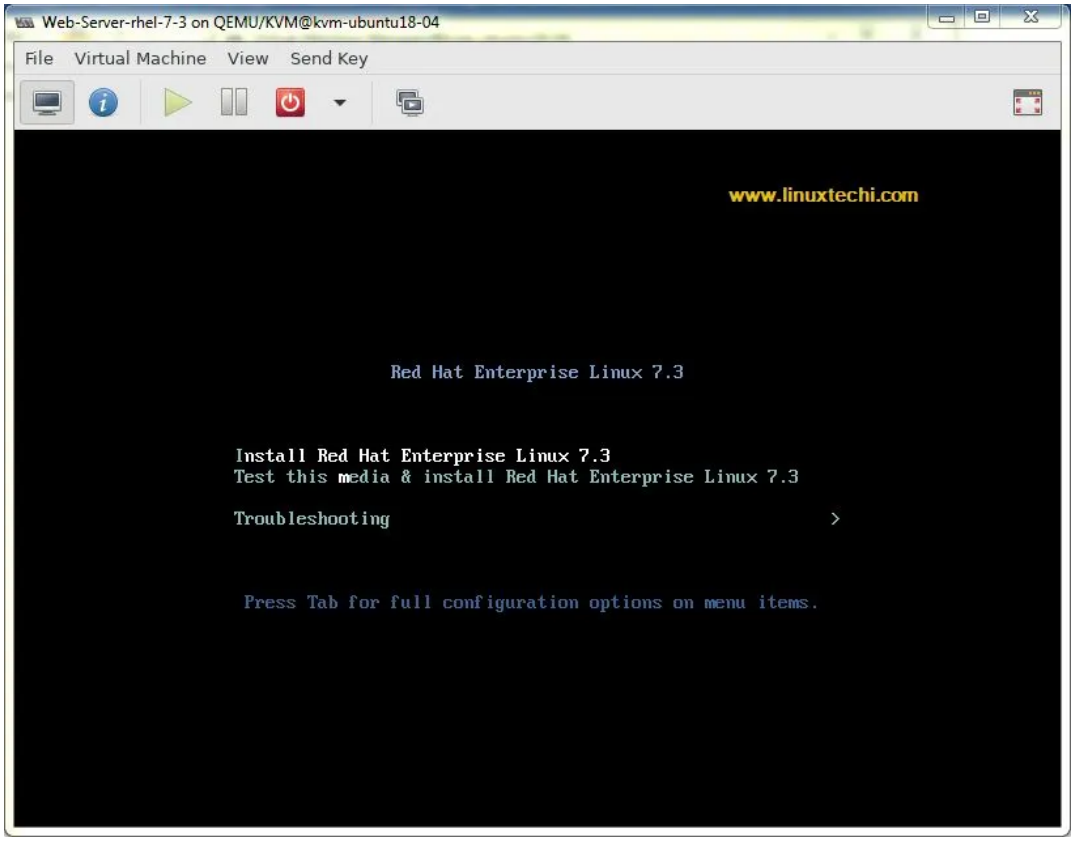
Click on Forward

In the next couple of windows, you will be prompted to specify the RAM, CPU and disk for the VM.

Now Specify the Name of the Virtual Machine and network,



Click on Finish



Now follow the screen instruction and complete the installation,

Read More On : "**How to Create, Revert and Delete KVM Virtual machine (domain) snapshot with virsh command**"

Creating Virtual machine from CLI using virt-install command,

Use the below virt-install command to create a VM from terminal, it will start the installation in CLI, replace the name of the VM, description, location of ISO file and network bridge as per your setup.

```
linuxtechi@kvm-ubuntu18-04:~$ sudo virt-install  -n DB-Server  --description
"Test VM for Database"  --os-type=Linux  --os-variant=rhel7  --ram=1096  --
vcpus=1  --disk path=/var/lib/libvirt/images/dbserver.img,bus=virtio,size=10  --
network bridge:br0 --graphics none  --location /home/linuxtechi/rhel-server-7.3-
x86_64-dvd.iso --extra-args console=ttyS0
```

That's conclude the article, I hope this article help you to install KVM on your Ubuntu 18.04 Server. Apart from this, KVM is the default hypervisor for Openstack.

Read More on : **How to Install and Configure KVM on OpenSUSE Leap 15**

Tags: KVM Ubuntu 18.04

23 thoughts on "How to Install and Configure KVM on Ubuntu 18.04 LTS Server"

MAC
June 1, 2018 at 7:54 pm

Great article.. straight to the point..

Reply

STEVE
June 27, 2018 at 7:58 am

Helpful – but virt-install wasn't recognised for me, I had to install virtinst also:
sudo apt install virtinst
Also I needed to replace –location with –cdrom and remove the extra-args (even though I was not using a cd rom, otherwise I got a 'Couldn't find hvm kernel .. error)

Reply

SMARTY
March 13, 2019 at 11:06 am

Its because of wrong ISO! Do not use the cloud based standard version – instead use the alternativ: at the moment:
'http://cdimage.ubuntu.com/releases/18.04.2/release/ubuntu-18.04.2-server-amd64.iso'
If you get an Error 404 there is a newer version. Check instead
'http://cdimage.ubuntu.com/releases'

Reply

GANNET
July 14, 2018 at 11:05 pm

I think it is better to remove netplan and use networkd to configure network including bridges. But thanks for how to use netplan for creating bridges. Now I know it.

Reply

ANDY
January 18, 2019 at 4:01 pm

GANNET

July 30, 2019 at 12:57 am

Netplan is not needed at all. It is crap. I'm using networkd without netplan. So don't tell me if…then. I'm not stupid.

Reply

CHITZLE

September 5, 2018 at 1:35 am

Sorry if this is sill question but why do we configure the br0 with a static IP and not the hardware interface ens33? Does this result in the host and the guest OS using the same IP?

Reply

PRADEEP KUMAR

September 6, 2018 at 2:02 am

Hi Chitzle,

If you want your virtual machines to be accessed from outside of KVM host then you need to create a bridge, remove the IP from eth0 or ens33 and assign the same ip to bridge interface.
Map VMs interface to the bridge either via command line or virt-manager.After that you can assign the IP from the VLAN which is associated to bridge.

Reply

ERIC

September 2, 2019 at 12:37 am

Could one instead configure the host machine as a router, forwarding packets between its physical interface and a separate virtual interface, the latter of which would be the gateway for guest machines' interfaces?

Reply

MIKEP

March 6, 2019 at 8:38 pm

Everything seemed to work, but I don't see the new vm assigned its own IP via dhcp as I expected.
'This is my xml dump

virsh dumpxml Node01

Node01
dc38066a-f428-4990-b2d1-cf88c6b346a2
4194304
4194304
2

/machine

hvm

destroy
restart
destroy

/usr/bin/kvm-spice

libvirt-dc38066a-f428-4990-b2d1-cf88c6b346a2
libvirt-dc38066a-f428-4990-b2d1-cf88c6b346a2

+64055:+115
+64055:+115

Reply

MAKSYM
March 12, 2019 at 2:08 pm

GUYS,

ALWAYS use YAML validators BEFORE you make ANY changes in vi /etc/netplan/50-cloud-init.yaml
—
Thanks author for article.

Reply

ARVIND PAL
April 3, 2019 at 7:32 am

Very nice article, step by step very helpful, Thanks

Reply

MICHAEL COOPER
April 14, 2019 at 6:01 pm

You must have installed this on a desktop because I cannot get virt-manager to work I get an error that it cannot start because of something with GTK-warning

cfadmin@cfamd:~$ sudo virt-manager
cfadmin@cfamd:~$ Unable to init server: Could not connect: Connection refused
Unable to init server: Could not connect: Connection refused
Unable to init server: Could not connect: Connection refused

(virt-manager:1875): Gtk-WARNING **: 17:59:02.848: cannot open display:

Anyone have a luce as to why it’s not starting?

Thanks,
Michael

Reply

ANONYM
May 3, 2019 at 7:14 pm

Depends: python-gi but it is not going to be installed
Depends: python-gi-cairo but it is not going to be installed
Depends: python-dbus but it is not going to be installed
Depends: python-requests but it is not going to be installed
Depends: python-libvirt (>= 0.7.1) but it is not going to be installed
Depends: virtinst (>= 1:1.5.1-0ubuntu1) but it is not going to be installed
E: Unable to correct problems, you have held broken packages.
And I can not install python2.7 😕

Reply

JV
May 10, 2019 at 5:15 pm

Step:4 .. are you adding or editing your current file?
if I add the suggested settings then I lose network connection.
How does the final full file of 50-cloud-init.yaml look like?

Reply

PRADEEP KUMAR
May 11, 2019 at 2:27 am

Hi ,

You should not loose your network connection as we are assigning the same IP of our Lan card to a bridge. In my case i am editing the existing file.

Make sure you put lines in correct format as it a YAML file.

Reply

ASKAR
May 15, 2019 at 12:56 pm

To check virtualization support the command should be …
egrep -c '(vmx|svm)' /proc/cpuinfo

Reply

CRISTIAN ARRIAZA
September 1, 2019 at 7:28 am

You are the best thank you very much, better than on the manufacturer's website 🙂

Reply

ERIC
September 2, 2019 at 12:54 am

Do I understand correctly from Step 5 that one can be logged into a headless U 18.04 server via ssh and run the graphical virt-manager utility? Even in the absence of a local graphical environment?

TONY

September 4, 2019 at 5:10 pm

You'll also need to install a X server on your host machine (for Windows, I recommend vcxsrv, open source and updated).

Reply

EDDIE

December 21, 2019 at 1:54 am

Doc states:
whenever we freshly installed Ubuntu 18.04 server then a file with name "/etc/netplan/50-cloud-init.yaml" is created automatically, to configure static IP and bridge, netplan utility will refer this file.

NOT TRUE, this file is missing.
Would be helpful if based on ifconfig output how this file could be created

Reply

PRADEEP KUMAR

December 23, 2019 at 4:21 am

Hi Eddie,

In case netplan is not present in your server then i would recommend create a file with name "01-netcfg.yaml" under /etc/netplan directory and copy paste the contents from article to this file.

Reply

KAMI

April 7, 2020 at 7:26 am

Great article, step by step very helpful^_^ Thanks

Reply

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