

# OcNOS® VM KVM Hypervisor Quick Start Guide

## 6.3.0

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# About the OcNOS VM

The OcNOS Virtual Machine (VM) from IP Infusion helps you get familiar with OcNOS. The OcNOS VM runs on a standard x86 environment. The OcNOS VM is used to validate configurations and test L2, L3, and MPLS features at your own pace, with no costs associated. Without bare metal switches, OcNOS VM can be on popular hypervisors including KVM, VirtualBox, and VMware. This document provides information on how to create an OcNOS VM in VirtualBox hypervisor.

All basic Layer 2, Layer 3, and multicast functionality are available. MPLS support is also available, including limited support of MPLS forwarding. The OcNOS VM comes with a 365 days valid license.

The data plane forwarding functions have limited support. OcNOS VM is designed for feature testing, and not for data plane performance testing or full bandwidth traffic testing.

## Benefits of the OcNOS VM

Following are benefits of OcNOS VM:

- Free
- No need to wait for the hardware
- Get familiar with OcNOS software
- Validate configurations
- Test L2, L3, and MPLS features without any risk
- Prototype network operations

## Feature List

CLIs for the following features are available. The complete feature set of OcNOS is supported on hardware platforms such as the whitebox switches from Dell, Delta Agema, Edgecore, and UFISpace. For the complete feature list, please contact IP Infusion Sales.

### SYSTEM FEATURES

- ARP support
- SSH/Telnet
- SNMP
- Debugging and logging
- AAA
- DHCP, DNS

### LAYER-2 FEATURES

- STP/RSTP/MSTP
- BPDU Guard and Root Guard
- VLAN, Private VLAN
- LACP
- LLDP

- VLAN Interface
- QinQ
- 802.1x

### LAYER-3 FEATURES

- IPv4 Routing
- VRF Support
- RIP v2, RIP NG
- BFD with BGP, OSPF, ISIS
- BGP
- OSPF v2, OSPF v3
- ISIS
- VRRP

## MPLS FEATURES

- MPLS Label Switching
- LDP and RSVP Support
- RSVP FRR
- VPLS with LDP Signaling
- VPWS with 1:1 backup support

- BGP MPLS L3VPN
- MPLS DCI using ICCP and VPLS redundancy

## MULTICAST FEATURES

- IGMP
- PIM-SM/SSM/DM
- MSDP Support

## Download the Virtual Machine Image

The OcNOS VM is available in these virtual environments:

Hypervisor Name	Format
VirtualBox, VMware	vmdk.xz
KVM	qcow2.xz

For the KVM hypervisor, download the OcNOS *qcow2.xz* image. OcNOS VM image file is archive compressed using XZ compression. Use Mac OS *Archive Utility* or *7-zip* tools to uncompress the file. To uncompress the file in Linux, use the command `xz -d <file_name>.xz`.

## Create a New OcNOS VM on KVM Hypervisor

### Configure the Network Bridge

To create a network bridge, create a file in the `/etc/sysconfig/network-scripts/` directory called `ifcfg-brN`, replacing N with the number for the interface, such as 0.

The following is a sample bridge interface configuration file using a static IP address:

```
DEVICE=br0
TYPE=Bridge
DELAY=0
BOOTPROTO=static
ONBOOT=yes
IPADDR=0.0.0.0
NETMASK=255.254.0.0
GATEWAY=0.0.0.0
DNS1=10.12.3.23
PEERDNS=yes
NM_CONTROLLED=no
```

You need to associate the physical interface of the host machine to this bridge. For example:

- Physical interface: `eno2`
- Bridge: `br0`

Sample file:

```
HWADDR=94:57:A5:52:E4:59
TYPE=Ethernet
NAME=en02
ONBOOT=yes
BRIDGE=br0
NM_CONTROLLED=no
```

After that, reboot the host machine and confirm that you are able to access the host machine with the IP assigned to the bridge.

Note: Refer to the CentOS 7 network bridge creation docs for more information.

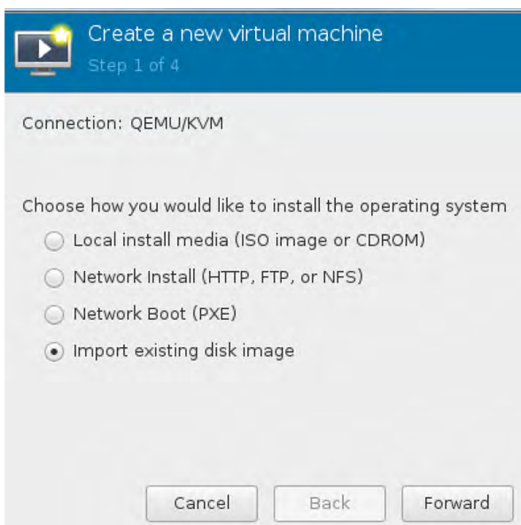
## Create a New OcNOS VM on KVM

Following are steps to create a new OcNOS VM on KVM Hypervisor:

1. Copy the OcNOS VM image to /var/lib/libvirt/images/.
2. Start virt-manager. Launch the Virtual Machine Manager application from the Applications menu and System Tools submenu. Alternatively, run the virt-manager command as root.
3. The virt-manager window allows you to create a new virtual machine. Click the Create a new virtual machine button to open the New VM wizard.



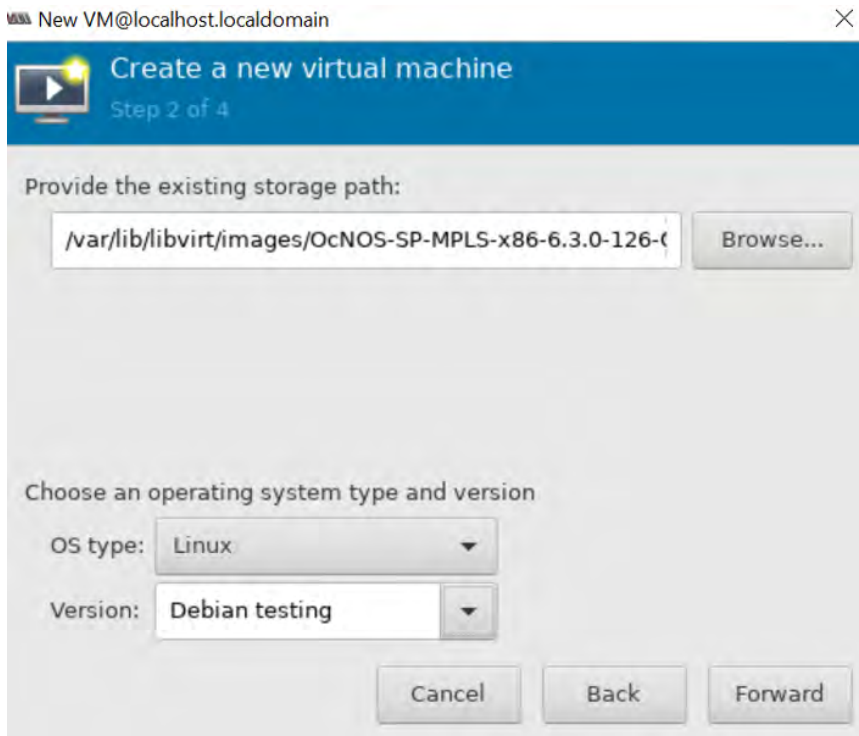
4. Choose the installation type.  
Select the installation method as import existing disk image. Click Forward.



5. Locate and configure the installation media.

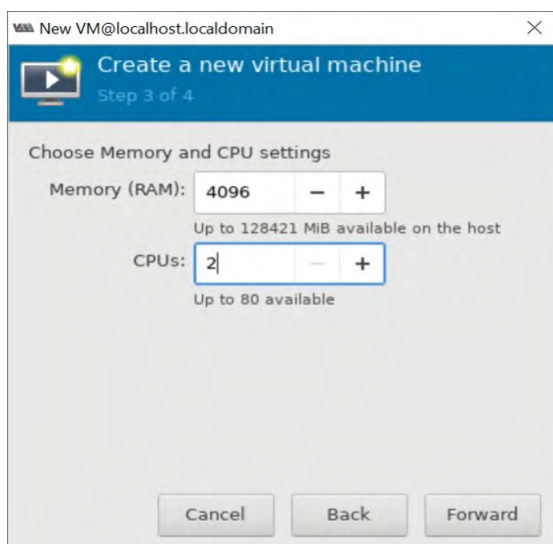
Configure the OS type and version of the installation. Ensure that you select the appropriate OS type for your virtual machine. Also, provide the existing storage path: /var/lib/libvirt/images/<imagename.qcow2>.

- OS type: Linux
- Version: Debian testing
- Click Forward

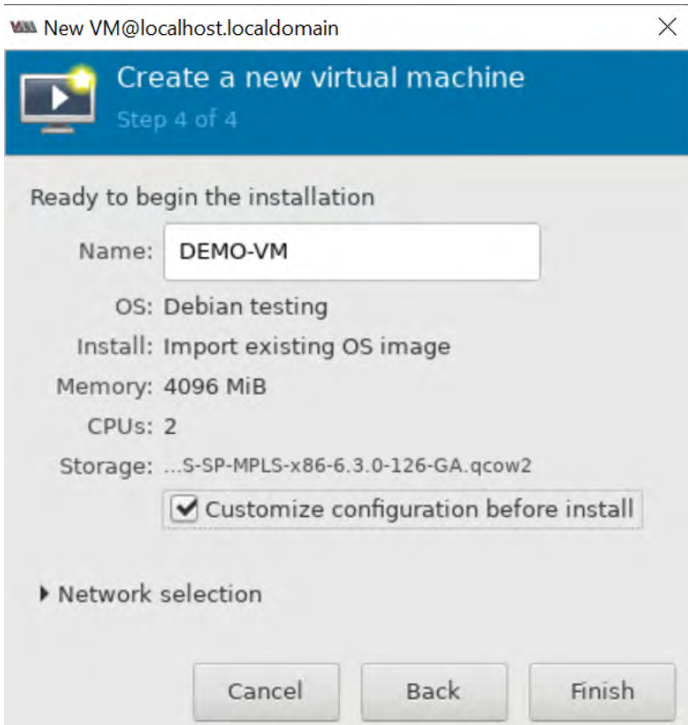


6. Configure the number of CPUs and amount of memory to allocate to the virtual machine.

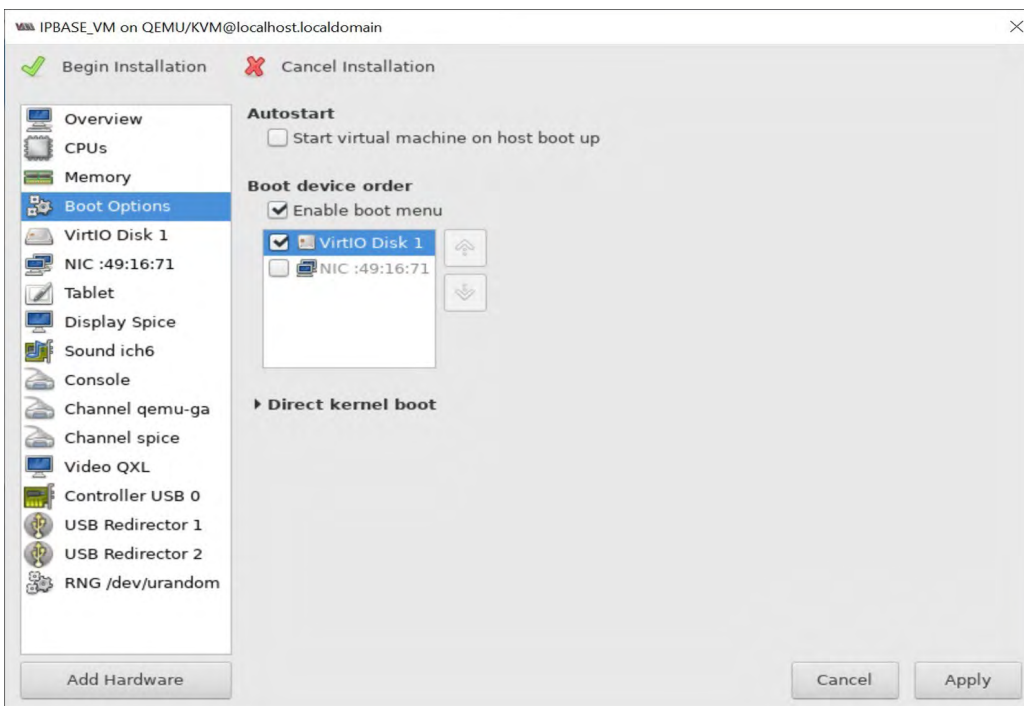
- Memory (RAM): 4096 MB
- CPUs: 2
- Click Forward



7. Name the guest virtual machine. Virtual machine names can have underscores (\_), periods (.), and hyphens (-).



8. Verify the settings of the virtual machine. Enable “Customize configuration before install” and click Finish.
9. Select Boot Options, Enable the “Enable boot menu” option and select “VirtIO Disk 1” as primary and click Apply. (Specify the VirtIO type to get better performance of the VM.)

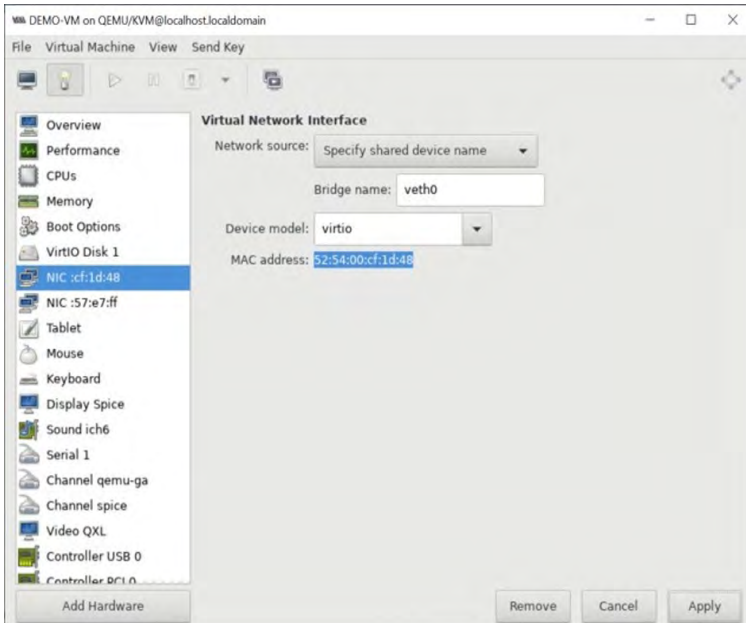


10. Click Begin Installation.

## Set up NIC Cards

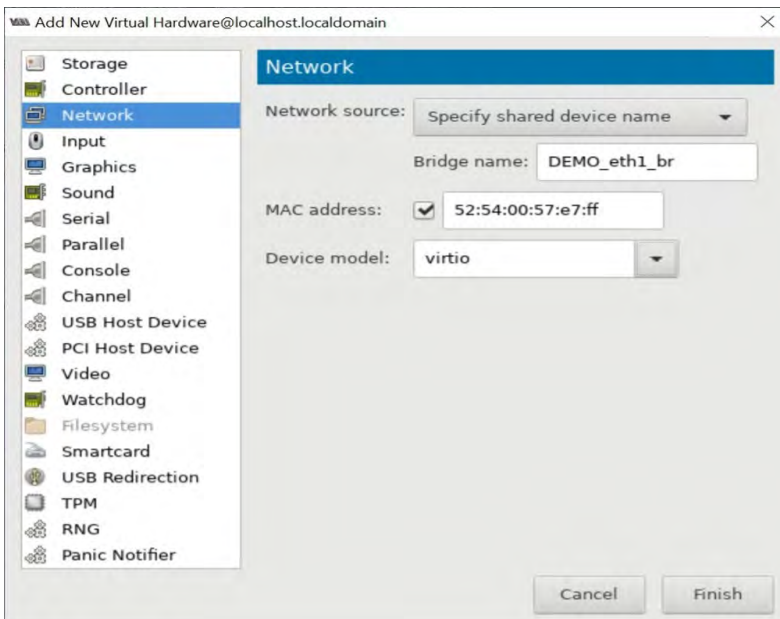
Set up the management port:

1. Shut down the VM before adding or configuring the NIC card.
2. Click on NIC card and in Network source select “Specify shared device name”.
3. For the bridge name, specify “veth0” and for the Device model, specify “virtio”.
4. Click “Apply”.



Set up the NIC card for the data ports:

1. Click on Add Hardware and add Network card.
2. In NIC card, Network source select “Specify shared device name”.
3. For the bridge name, specify “DEMO\_eth1\_br” and for the Device model, specify “virtio”.
4. Click “Finish”.

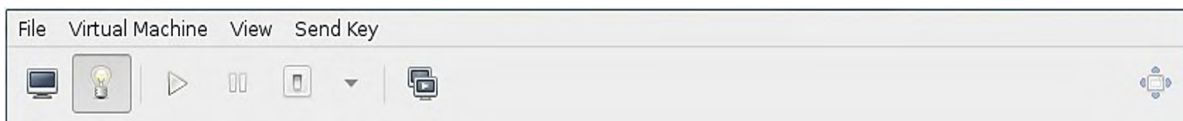


Start the VM by double-clicking it in the list or by selecting it and clicking the power on button Start the VM.



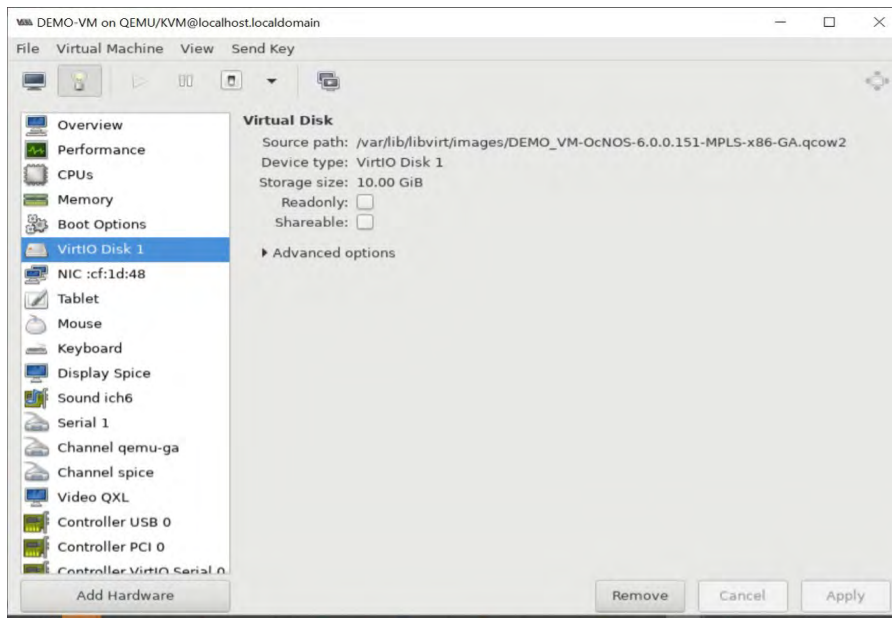
## Check the Virtual Hardware Details

Click the Hardware Details Icon:

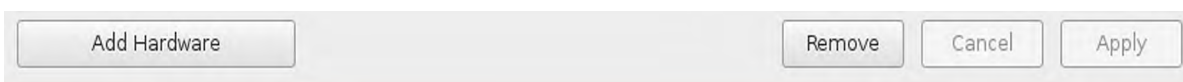


Virtual disk details:

To change/add the hardware on the VM:



1. Shut down the VM.
2. Click Add Hardware.



3. Change/add the hardware details and Click apply.
4. Start the VM and check the hardware details.



# Set up Basic Configuration in the OcNOS VM

Log in using the following credentials:

- Username: ocnos
- Password: ocnos

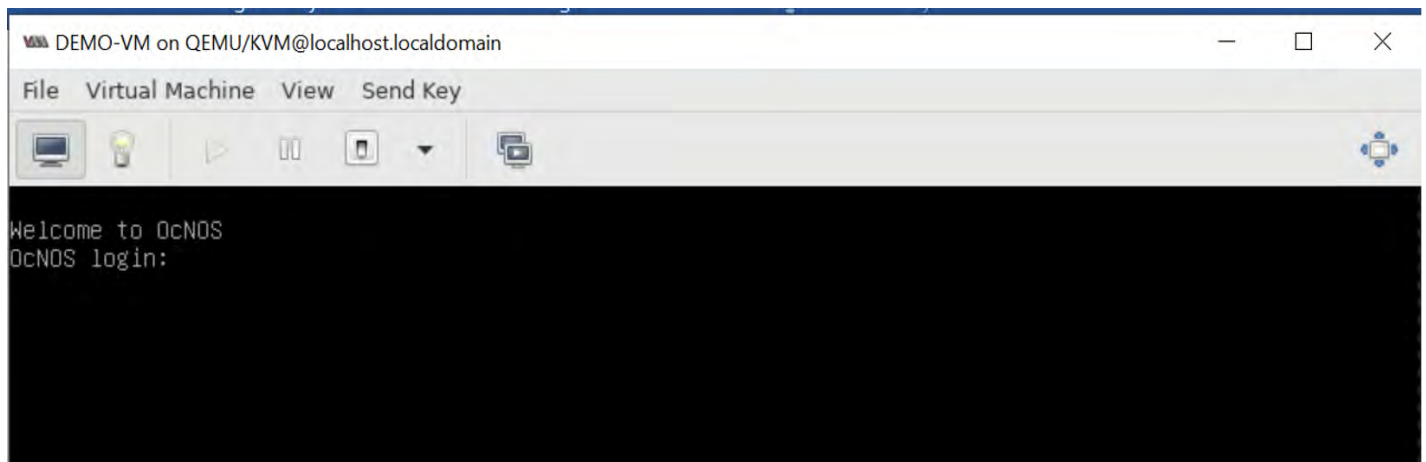
This displays the OcNOS shell prompt.

## Access the VM through Virtual Machine Manager on KVM

1. Select the Ocnos VM by double-clicking it in the Virtual Machine Manager list.



2. VM console will show as below after double click on the newly created Ocnos VM.



## Access the VM through SSH using Mgmt IP address

Follow the steps in this section to configure eth0 in the OcNOS VM so that you can access the VM through programs such as `ssh` or `putty`.

1. Enter the following commands:

- Enter enable mode  
OcNOS>en
- Enter configuration mode:  
OcNOS#conf t

- Two options to configure the management port:

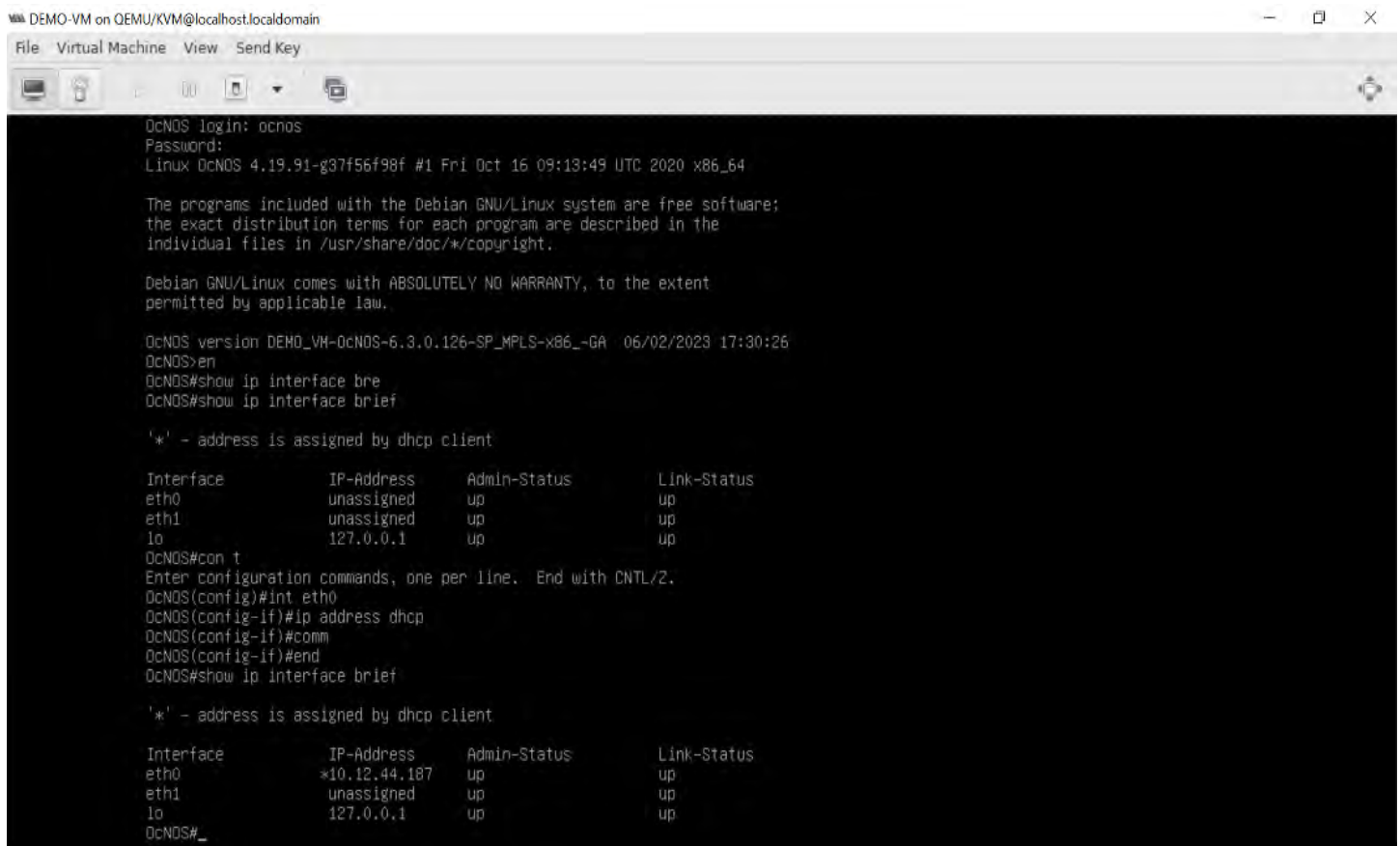
If you have DHCP server in your network, use the following commands:

```
OcNOS (config)# int eth0
OcNOS (config-if)# ip address dhcp
OcNOS (config-if)# exit
OcNOS (config)# commit
OcNOS (config) #exit
```

Otherwise manually configure the IP address using the following commands:

```
OcNOS (config)# int eth0
OcNOS (config-if)# ip address 10.12.44.120/24
OcNOS (config-if)# exit
OcNOS (config)# commit
OcNOS (config) #exit
```

2. Check the IP address assigned to the OcNOS VM using the `show ip interface brief` command. 10.12.44.187 is the IP address of the newly created VM.



The screenshot shows a terminal window titled "DEMO-VM on QEMU/KVM@localhost.localdomain". The terminal output is as follows:

```
OcNOS login: ocnos
Password:
Linux OcNOS 4.19.91-g37f56f98f #1 Fri Oct 16 09:13:49 UTC 2020 x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.

OcNOS version DEMO_VM-OcNOS-6.3.0.126-SP_MPLS-x86_-GA 06/02/2023 17:30:26
OcNOS>en
OcNOS#show ip interface bre
OcNOS#show ip interface brief

'*' - address is assigned by dhcp client

Interface      IP-Address      Admin-Status      Link-Status
eth0           unassigned      up                 up
eth1           unassigned      up                 up
lo             127.0.0.1       up                 up
OcNOS#con t
Enter configuration commands, one per line. End with CNTL/Z.
OcNOS(config)#int eth0
OcNOS(config-if)#ip address dhcp
OcNOS(config-if)#comm
OcNOS(config-if)#end
OcNOS#show ip interface brief

'*' - address is assigned by dhcp client

Interface      IP-Address      Admin-Status      Link-Status
eth0           *10.12.44.187   up                 up
eth1           unassigned      up                 up
lo             127.0.0.1       up                 up
OcNOS#_
```

- Using the IP address, you can connect to the VM via `ssh` as follows using `ocnos` userid and `ocnos` password.

```
% ssh ocnos@10.12.44.187
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.12.44.187' (ED25519) to the list of known
hosts. ocnos@10.12.44.187's password:
Linux OcNOS 4.19.91-g37f56f98f #1 Fri Oct 16 09:13:49 UTC 2020 x86_64
Last login: Mon Jun 12 16:37:15 2023
OcNOS version DEMO_VM-OcNOS-6.3.0.126-SP_MPLS-x86_-GA 06/02/2023 17:30:262
OcNOS>
```

```
[root@localhost ~]#
[root@localhost ~]# ssh ocnos@10.12.44.187
ocnos@10.12.44.187's password:
Linux OcNOS 4.19.91-g37f56f98f #1 Fri Oct 16 09:13:49 UTC 2020 x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Jun 13 06:11:00 2023

OcNOS version DEMO_VM-OcNOS-6.3.0.126-SP_MPLS-x86_-GA 06/02/2023 17:30:26
OcNOS>en
OcNOS#
OcNOS#show version
Software version: DEMO_VM-OcNOS-SP-MPLS-x86-6.3.0-GA 06/02/2023 17:30:26
Copyright (C) 2023 IP Infusion. All rights reserved

Software Product: OcNOS-SP, Version: 6.3.0
Build Number: 126
Release: GA
Hardware Model:
Software Feature Code: MPLS-x86
Software Baseline Version: 6.0.117
OcNOS#
```

## References

The following are reference materials related to OcNOS:

- [OcNOS Configuration Guides](#)

### ABOUT IP INFUSION

IP Infusion is a leading provider of open network software and solutions for carriers, service providers and data center operators. Our solutions enable network operators to disaggregate their networks to accelerate innovation, streamline operations, and reduce Total Cost of Ownership (TCO). Network OEMs may also disaggregate network devices to expedite time to market, offer comprehensive services, and achieve carrier grade robustness. IP Infusion network software platforms have a proven track record in carrier-grade open networking with over 500 customers and over 10,000 deployments. IP Infusion is headquartered in Santa Clara, Calif., and is a wholly owned and independently operated subsidiary of ACCESS CO., LTD. Additional information can be found at <http://www.ipinfusion.com>

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