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VBoxHeadless - Running Virtual Machines with VirtualBox 5.1 on a headless Ubuntu 16.04 LTS Server

Ad Hired: The End of Job Hunting As You Know It

This guide explains how you can run virtual machines with [VirtualBox 5.1](#) on a headless Ubuntu 16.04 server.

Normally you use the VirtualBox GUI to manage your virtual machines, but a server does not have a desktop environment. Fortunately, VirtualBox comes with a tool called VBoxHeadless that allows you to connect to the virtual machines over a remote desktop connection, so there's no need for the VirtualBox GUI.

This tutorial exists for these OS versions

- [Ubuntu 14.04 LTS \(Trusty Tahr\)](#)

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1 Preliminary Note

I have tested this on an Ubuntu 16.04 server (host system) with the IP address `192.168.1.100` where I'm logged in as a normal user (user name *administrator* in this example) instead of as *root*.

2 Installing VirtualBox

To install VirtualBox 5.1 on our Ubuntu 16.04 server, we open `/etc/apt/sources.list...`

```
sudo nano /etc/apt/sources.list
```

... and add the following line to it:

```
deb http://download.virtualbox.org/virtualbox/debian xenial contrib
```

Then we download the VirtualBox public key...

```
wget -q https://www.virtualbox.org/download/oracle_vbox_2016.asc -O- | sudo  
apt-key add -
```

... and update our package database:

```
sudo apt-get update
```

Afterwards, we install VirtualBox 5.1 as follows:

```
sudo apt-get install linux-headers-$(uname -r) build-essential  
virtualbox-5.1 dkms
```

(The *dkms* package ensures that the VirtualBox host kernel modules are properly updated if the Linux kernel version changes.)

Starting with version 4.0, VirtualBox has introduced so called "extension packs" and has outsourced some functionality like remote desktop connection support (VRDP) that was part of VirtualBox packages before version 4.0 into these extension packs. Because we need remote desktop connections to control our virtual machines, we need to install the appropriate extension pack now. Go to <http://www.virtualbox.org/wiki/Downloads>, and

you will find a link to the following extension pack:

VirtualBox 5.1 Oracle VM VirtualBox Extension Pack

Download and install the extension pack as follows:

```
cd /tmp
wget http://download.virtualbox.org/virtualbox/5.1.0
/Oracle_VM_VirtualBox_Extension_Pack-5.1.0-108711.vbox-extpack
sudo VBoxManage extpack install Oracle_VM_VirtualBox_Extension_Pack-
5.1.0-108711.vbox-extpack
```

(Make sure you grab the latest version from the VirtualBox website and to use `sudo` to install the `extpack` file with `VBoxManage`.)

Now we must add the user that will run VirtualBox (*administrator* in this example) to the *vboxusers* group:

```
sudo adduser administrator vboxusers
```

VirtualBox is now installed and ready to be used.

3 Using VirtualBox on the Command Line

3.1 Creating A VM

To create a VM on the command line, we can use the *VBoxManage* command. See

```
VBoxManage --help
```

for a list of available switches and (highly recommended!) take a look at <http://www.virtualbox.org/manual/ch08.html>.

I will now create an Ubuntu 16.04 Server VM with 2048MB memory and a 10GB hard drive from the Ubuntu 16.04 Server iso image (which I have stored in */home/administrator/iso/ubuntu-16.04-server-amd64.iso*):

```
VBoxManage createvm --name "Ubuntu 16.04 Server" --register
VBoxManage modifyvm "Ubuntu 16.04 Server" --memory 2048 --acpi on --boot1 dvd
--nic1 bridged --bridgeadapter1 ens33
VBoxManage createhd --filename /home/administrator/Ubuntu_16_04_Server.vdi
--size 10000
VBoxManage storagectl "Ubuntu 16.04 Server" --name "IDE Controller" --add ide
VBoxManage storageattach "Ubuntu 16.04 Server" --storagectl "IDE Controller"
```

```
--port 0 --device 0 --type hdd --medium /home/administrator
/Ubuntu_16_04_Server.vdi
VBoxManage storageattach "Ubuntu 16.04 Server" --storagectl "IDE Controller"
--port 1 --device 0 --type dvddrive --medium /home/administrator/iso/ubuntu-
16.04-server-amd64.iso
VBoxManage modifyvm "Ubuntu 16.04 Server" --vrde on
```

Now proceed with chapter 3.3 to start the vm and then connect to the VM with a remote desktop client as described in chapter 4.

3.2 Importing an Existing VM

Let's assume you have a VM called *examplevm* that you want to reuse on this host. On the old host, you should have a directory *Machines/examplevm* in the VirtualBox directory; *Machines/examplevm* should contain the *examplevm.xml* file. Copy the *examplevm* directory (including the *examplevm.xml* file) to your new *Machines* directory (if your user name is administrator, this is */home/administrator/.VirtualBox/Machines* - the result should be */home/administrator/.VirtualBox/Machines/examplevm/examplevm.xml*).

In addition to that copy the *examplevm.vdi* file from the old *VDI* directory to the new one (e.g. */home/administrator/.VirtualBox/VDI/examplevm.vdi*).

Afterwards, you must register the imported VM:

```
VBoxManage registervm Machines/examplevm/examplevm.xml
```

3.3 Starting a VM with VBoxHeadless

Regardless of if you create a new VM or import an old one, you can start it with the command:

```
VBoxHeadless --startvm "Ubuntu 16.04 Server"
```

(Replace *Ubuntu 16.04 Server* with the name of your VM.)

VBoxHeadless will start the VM and a VRDP (*VirtualBox Remote Desktop Protocol*) server which allows you to see the VM's output remotely on another machine.

To stop a VM, run

```
VBoxManage controlvm "Ubuntu 16.04 Server" poweroff
```

To pause a VM, run

```
VBoxManage controlvm "Ubuntu 16.04 Server" pause
```

To reset a VM, run

```
VBoxManage controlvm "Ubuntu 16.04 Server" reset
```

To learn more about

VBoxHeadless, take a look at

```
VBoxHeadless --help
```

and at <http://www.virtualbox.org/manual/ch07.html#vboxheadless>.

4 Connecting to a VM from a Remote Desktop

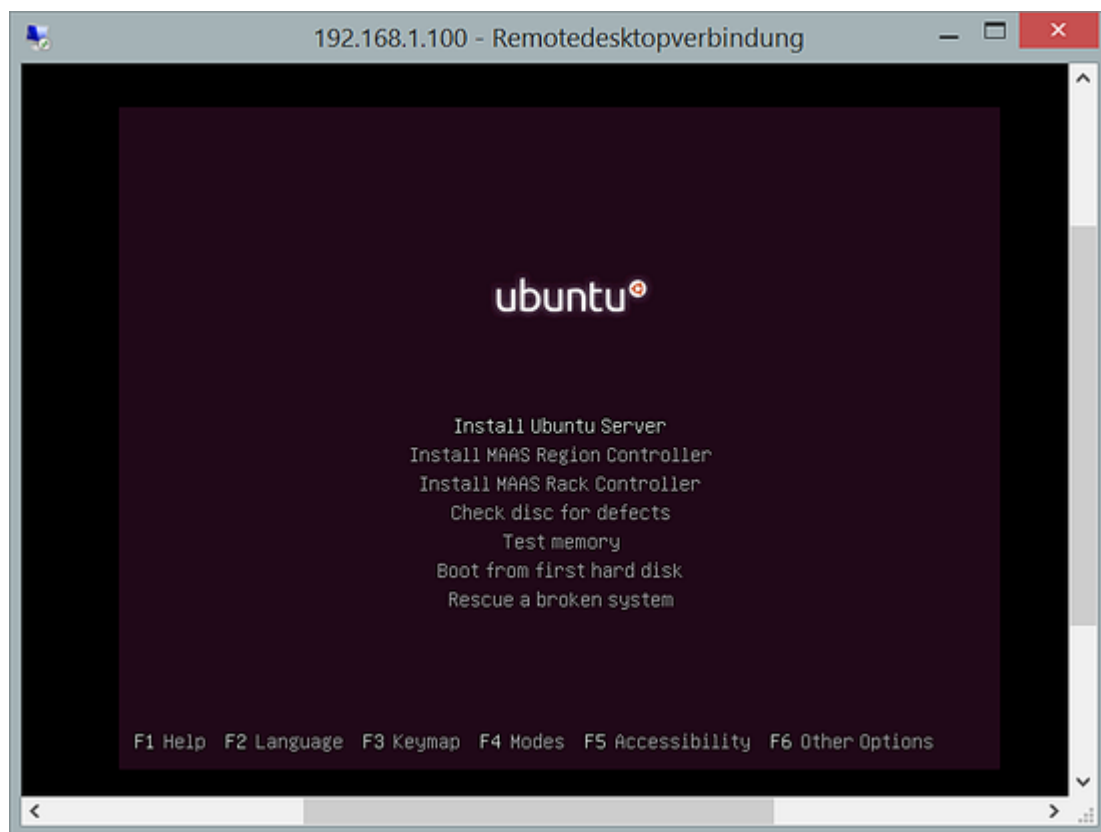
4.1 Windows

You can use the built-in *Remote Desktop Connection* utility to connect to the VM.

Type in the hostname or IP address of the host (not the guest!):



And voilà, you should be connected to the VM:



4.2 Ubuntu Desktop

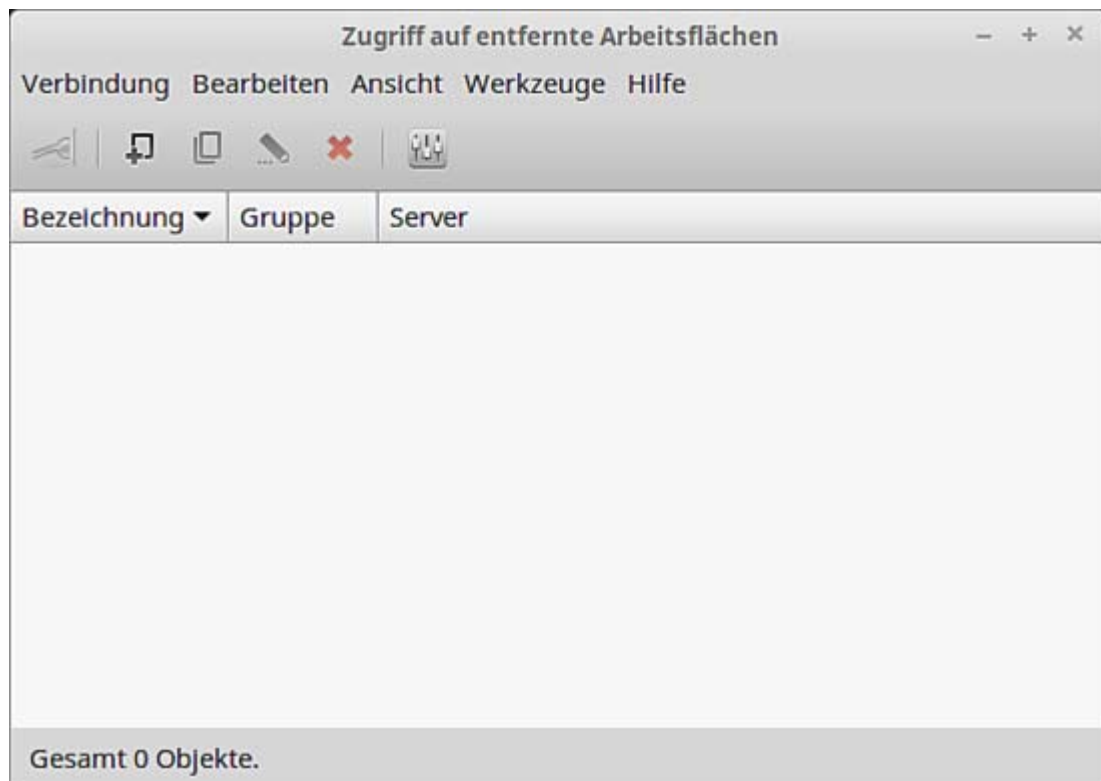
On Ubuntu desktops, you can use the *Remmina Remote Desktop Client* or *gnome-rdp* to connect to the VM.

Install the client with apt:

```
sudo apt-get install remmina remmina-plugin-rdp
```

Just search for *remmina* and then double-click the *Remmina Client* icon to start the RDP application.

In the *Remmina Remote Desktop Client*, click on the plus icon to add a new remote desktop connection:



In the *Remote Desktop Preference* window, fill in a name for the profile (like *Ubuntu 16.04 Server*), make sure that *RDP* is selected as the protocol (it should be selected by default), then fill in the host IP address - not the IP of the VirtualBox guest! - in the *Server* field, and select a higher *Color depth* than the default of 8bpp - 16bpp is ok. Then click on *Connect*:

Einstellungen für entfernte Arbeitsflächen

Profil

Bezeichnung:

Gruppe:

Protokoll:

☒ Grundlegend ☐ Erweitert ☐ SSH

Server:

Benutzername:

Passwort:

Domain:

Bildschirmauflösung: ☒ Auflösung des Clients verwenden
☐ Benutzerdefiniert:

Farbtiefe:

Ordner freigeben: ☐

And voilà, you should be connected to the VM:



4.3 If the Remote Desktop Connection doesn't work...

If the remote desktop connection doesn't work, you've probably missed the step where I install the VirtualBox extension pack in chapter 2. Please install the extension pack now, stop your virtual machine (see chapter 3.3), and modify your virtual machine to accept remote desktop connections:

```
VBoxManage modifyvm "Ubuntu 16.04 Server" --vrde on
```

(If the extension pack is already installed when you create your virtual machine, remote desktop connections are automatically enabled.)

Then start your virtual machine again.

5 Links

- VirtualBox: <http://www.virtualbox.org/>
- Ubuntu: <http://www.ubuntu.com/>

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Comments

From: Tomas **at:** 2016-07-14 08:44:02

Reply

Good article.

From: Rob **at:** 2016-08-01 21:11:22

Reply

Thanks, I'm noticing APT still wants to install X, how would one explicitly exempt X and all the other useless packages?

From: Raj **at:** 2016-08-03 04:20:39

Reply

I get this error during
sudo apt-get install linux-headers-\$(uname -r)
E: Unable to locate package linux-headers-3.14.32-xxxx-grs-ipv6-64
Note uname -r shows 3.14.32-xxxx-grs-ipv6-64
please help

From: wouter **at:** 2016-09-06 10:43:09

Reply

when i start the vm i get the error message:
Error: failed to start machine. Error message: Failed to open/create the internal network 'HostInterfaceNetworking-ens33' (VERR_INTNET_FLT_IF_NOT_FOUND)
Can you please help me in solving this. I tried googling the error, but had no luck in finding a working answer.

From: sekwent **at:** 2016-09-16 10:08:22

Reply

i have same problem

From: boxy **at:** 2016-09-16 20:19:00

Reply

Excellent article. Learned a lot.
For the guys having trouble with the 'Error: failed to start machine. Error message: Failed to open/create the internal network 'HostInterfaceNetworking-ens33' (VERR_INTNET_FLT_IF_NOT_FOUND)' my solution was to change the 'ens33' part to 'eth0'. Basically it's the networking part of Virtualbox and with the bridged adapter it uses the host's connection, on mine it's 'eth0' and on the author of the article it's 'ens33'. Good luck.

From: Gertjan Groen **at:** 2016-11-01 15:04:29

[Reply](#)

It looks like it expects a soundcard? It works anyway. But I don't have a soundcard in my server so I might have to disable the soundcard.
Also, internet did not work directly. For some reason the cable did not get connected? I had to do the following, is that normal behavior?
vboxmanage controlvm "Ubuntu 16.04 Server" setlinkstate1 on

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Tutorial Info

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