

# How to increase HDP 2.5 Sandbox VirtualBox VM Disk Size

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## Part 0: Prerequisites

- a) Download the gparted tool (ISO image) from the following link:  
[https://sourceforge.net/projects/gparted/?source=typ\\_redirect](https://sourceforge.net/projects/gparted/?source=typ_redirect)
- b) You have installed VirtualBox software.
- c) You have imported the Hortonworks HDP 2.5 \*.ova file (aka 'Hortonworks Docker Sandbox') into VirtualBox.

## Part 1: Resize the Virtualbox file to allow for more disk space

Open up the DOS/Windows command-line (i.e: cmd.exe) and change directory to C:\Program Files\Oracle\VirtualBox:

```
cd "C:\Program Files\Oracle\VirtualBox"
```

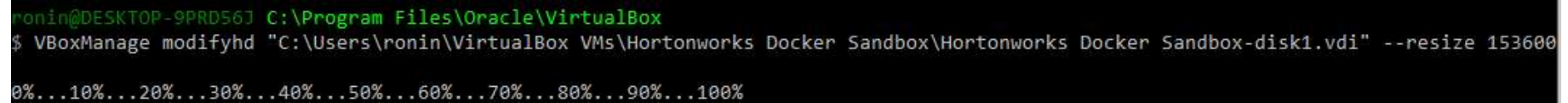
The downloaded sandbox's VM uses the \*.vmdk image format which cannot be resized. So we have to convert the \*.vmdk image format to a \*.vdi image format that can be resized. Run the following to clone the VM from a \*.vmdk file to a \*.vdi file. Remember to substitute <winuser> with your own Windows user account name.

```
VBoxManage clonehd "C:\Users\<winuser>\VirtualBox VMs\Hortonworks Docker Sandbox\Hortonworks Docker Sandbox-disk1.vmdk"  
"C:\Users\<winuser>\VirtualBox VMs\Hortonworks Docker Sandbox\Hortonworks Docker Sandbox-disk1.vdi" --format VDI --variant  
Standard
```

```
ronin@DESKTOP-9PRD56J C:\Program Files\Oracle\VirtualBox  
$ VBoxManage clonehd "C:\Users\ronin\VirtualBox VMs\Hortonworks Docker Sandbox\Hortonworks Docker Sandbox-disk1.vmdk" "C:\Users\ronin\VirtualBox VMs\Hortonworks Docker Sandbox\Hortonworks Docker Sandbox-disk1.vdi" --format VDI --variant Standard  
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%  
Clone medium created in format 'VDI'. UUID: 364591be-5727-4a76-a371-e919db9877e7
```

Next, resize the VDI image from 48G to 150G, like so:

```
VBoxManage modifyhd "C:\Users\<winuser>\VirtualBox VMs\Hortonworks Docker Sandbox\Hortonworks Docker Sandbox-disk1.vdi" --resize 153600
```



```
ronin@DESKTOP-9PRD56J C:\Program Files\Oracle\VirtualBox
$ VBoxManage modifyhd "C:\Users\ronin\VirtualBox VMs\Hortonworks Docker Sandbox\Hortonworks Docker Sandbox-disk1.vdi" --resize 153600
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
```

## **Part 2: Reconfigure the sandbox VM in VirtualBox to use the new VDI file**

All of the following steps will be done in the VirtualBox GUI.

- a) Launch VirtualBox
- b) Select the “Hortonworks Docker Sandbox” (i.e: Hortonworks Sandbox VM for HDP 2.5)

Remove the existing VMDK image from the VM:

- c) Click Settings to bring up the VM’s settings
- d) Click Storage
- e) Select the ‘Hortonworks Docker Sandbox-disk1.vmdk’ image in the Storage Tree (under Controller). And click the [ - ] button at bottom to remove the \*.vmdk image.

Add the new VDI image to the VM:

- f) Click the [ + ] button and choose ‘Add Hard Disk’.
- g) Select to ‘Choose Existing Disk’ when prompted. Navigate to where the new \*.vdi file is stored from Part 1 and select it. (i.e: “C:\Users\<winuser>\VirtualBox VMs\Hortonworks Docker Sandbox\Hortonworks Docker Sandbox-disk1.vdi”).

### **Part 3: Reconfigure the sandbox VM in VirtualBox to boot from the gparted ISO (aka DVD image) you downloaded earlier.**

Though the VDI disk has been resized it's not ready for use by the CentOS Linux to be run in the VM. The newly allocated space on the “virtual disk” (i.e: VDI image) needs to be repartitioned/formatted properly before use. To do this we need to boot the machine into gparted and use gparted to prepare the disk.

To boot the VM from an ISO image, we need to add an optical drive (CDROM/DVD drive) to the VM:

- a) In the VM settings, click on Storage
- b) Click the [ + ] button beneath the Storage Tree and choose ‘Add Optical Drive’.
- c) Select to ‘Choose Disk’ when prompted to load a disk into the new drive. Navigate to where the gparted ISO image is on your machine (e.g: Downloads\gparted-live0.27.0-1.i686.iso) and select it.

At this point, your sandbox VM has VDI based “hard-drive” and a “cd/dvd-drive” holding the gparted ISO. We want to boot the VM using the gparted ISO (instead of the VDI). Normally the VM will look at the hard-drive first and boot off that. So we need to change the boot-order so that the optical-drive is considered first:

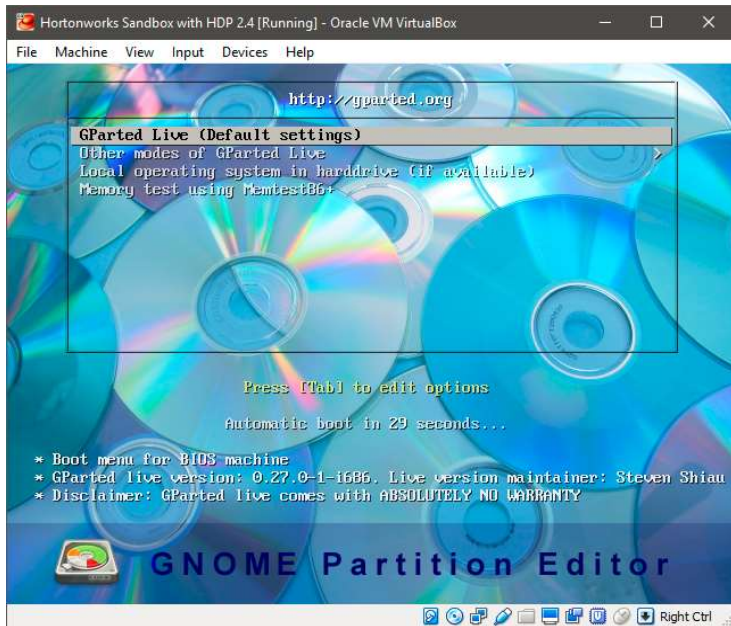
- a) In the VM settings, click on System
- b) Select the ‘Optical’ option in the Boot Order list.
- c) Use the up/down arrows beside the Boot Order list to move the ‘Optical’ option to be the first in the list.

Click ‘OK’ and save the settings changes which will return you back to the main VirtualBox screen.

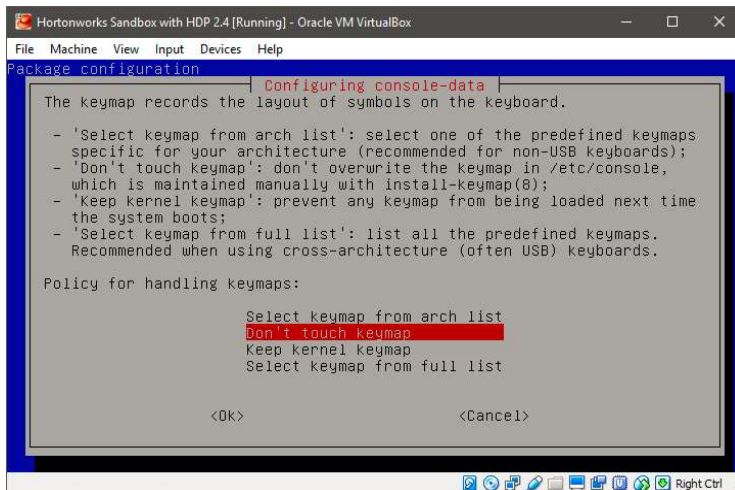
At this point you're ready to boot the VM directly into gparted.

## Part 4: Prepare the disk partition using gparted

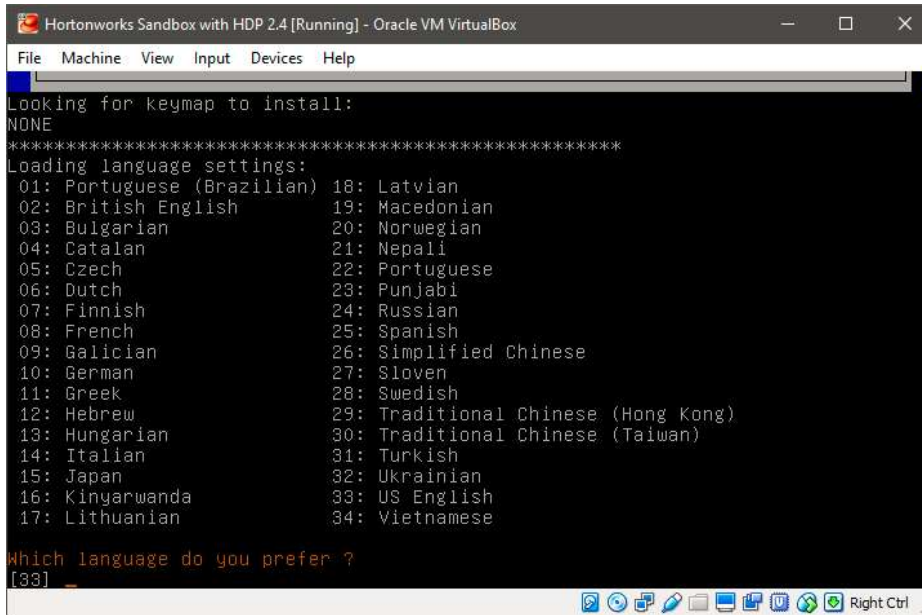
In VirtualBox main screen, start the 'Hortonworks Docker Sandbox'. This will boot the VM directly into gparted and you'll be presented with the following screen (in the Virtualbox VM console). Just opt for the default settings by pressing [ENTER].



You'll be presented with the following screen. Again press [ENTER] to retain current keymaps.



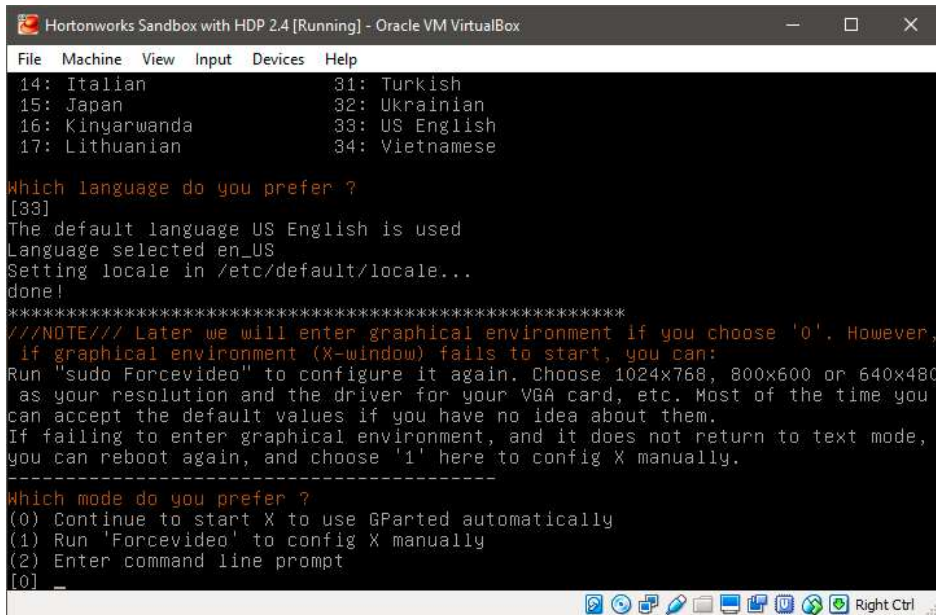
You'll be presented with the following screen. Again click [ENTER] to choose the default language (US English).



```
Hortonworks Sandbox with HDP 2.4 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Looking for keymap to install:
NONE
*****
Loading language settings:
01: Portuguese (Brazilian) 18: Latvian
02: British English        19: Macedonian
03: Bulgarian              20: Norwegian
04: Catalan                21: Nepali
05: Czech                  22: Portuguese
06: Dutch                  23: Punjabi
07: Finnish                24: Russian
08: French                  25: Spanish
09: Galician               26: Simplified Chinese
10: German                 27: Sloven
11: Greek                  28: Swedish
12: Hebrew                 29: Traditional Chinese (Hong Kong)
13: Hungarian              30: Traditional Chinese (Taiwan)
14: Italian                31: Turkish
15: Japan                  32: Ukrainian
16: Kinyarwanda            33: US English
17: Lithuanian             34: Vietnamese

Which language do you prefer ?
[33]
```

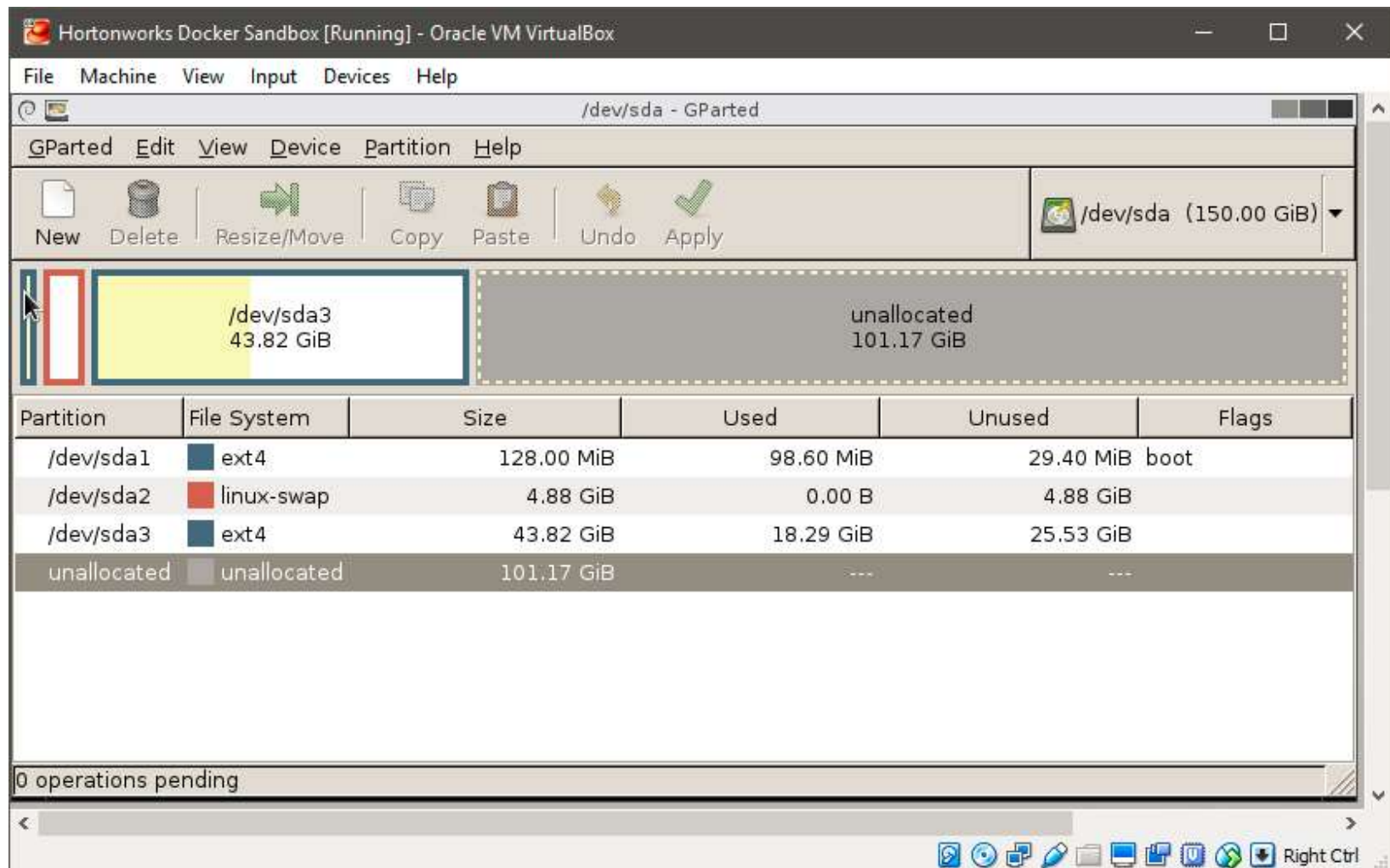
You'll be presented with the following choice. Just press [ENTER] to continue with defaults.



```
Hortonworks Sandbox with HDP 2.4 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
14: Italian                31: Turkish
15: Japan                  32: Ukrainian
16: Kinyarwanda            33: US English
17: Lithuanian             34: Vietnamese

Which language do you prefer ?
[33]
The default language US English is used
Language selected en_US
Setting locale in /etc/default/locale...
done!
*****
///NOTE/// Later we will enter graphical environment if you choose '0'. However,
if graphical environment (X-window) fails to start, you can:
Run "sudo Forcevideo" to configure it again. Choose 1024x768, 800x600 or 640x480
as your resolution and the driver for your VGA card, etc. Most of the time you
can accept the default values if you have no idea about them.
If failing to enter graphical environment, and it does not return to text mode,
you can reboot again, and choose '1' here to config X manually.
-----
Which mode do you prefer ?
(0) Continue to start X to use GParted automatically
(1) Run 'Forcevideo' to config X manually
(2) Enter command line prompt
[0]
```

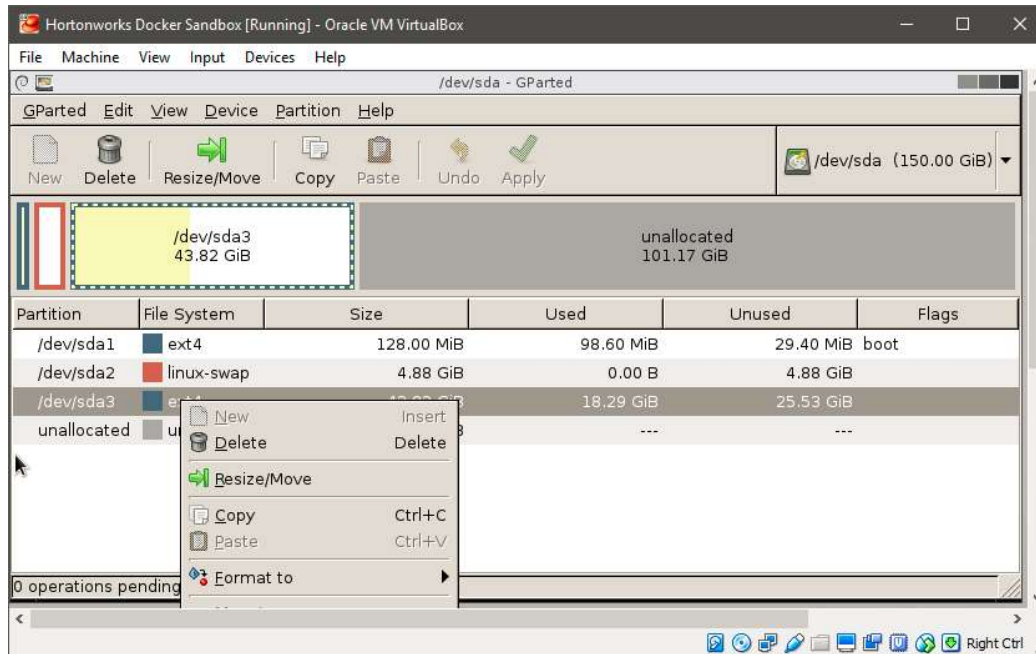
Finally, you'll arrive at the gparted main screen showing the existing partitions and unallocated space of the VM's VDI disk. For the HDP 2.5 Sandbox VDI disk it should be something like the following with 3 partitions (aka /dev devices):



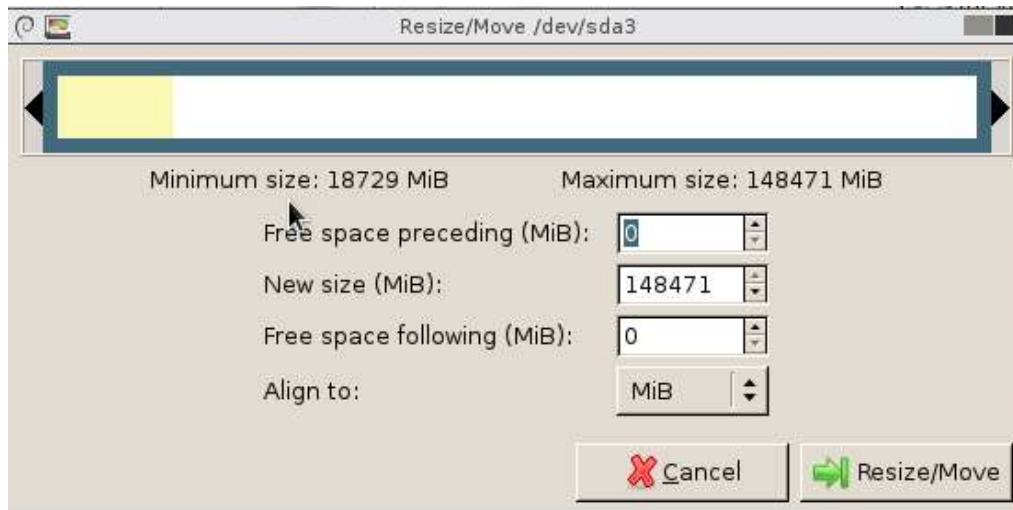
Note the /dev/sda3 partition. This is the partition that is the main disk used by the CentOS/sandbox in the VM. Currently, it's only taking up the original ~43G that the sandbox was setup with. The extra space we introduced by expanding the VDI image remains in the 'unallocated' block at the bottom (~101.17G).



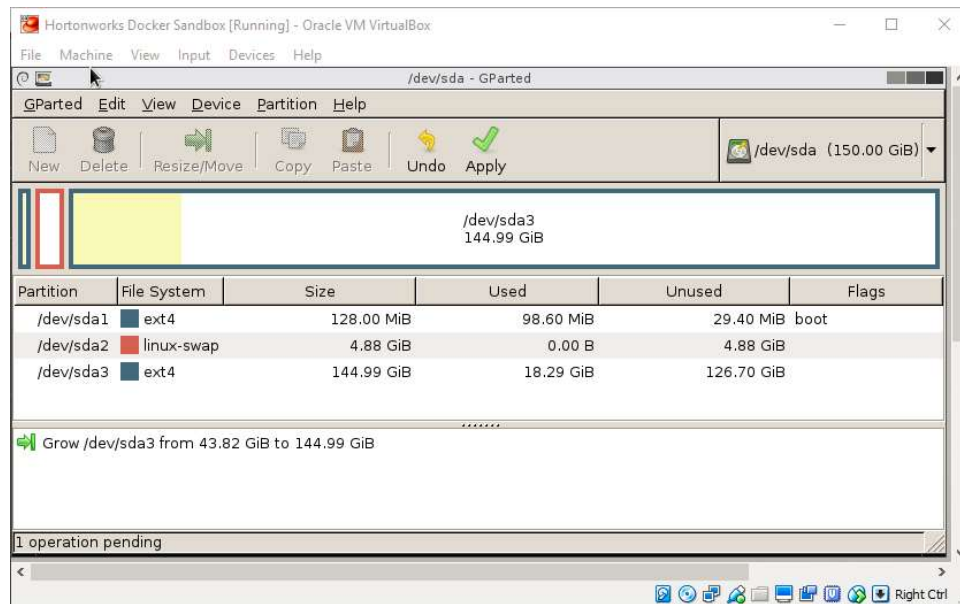
So we have to extend the `/dev/sda3` partition to use the 'unallocated' space. Right-click on `/dev/sda3` and choose 'Resize' like so:



The following dialog will popup. Maximize the 'New Size' (thus minimizing the 'Free Space' to 0). You can either edit the textboxes, use the scroll arrows or you can just use the horizontal expander at top (click on it's right-edge and drag it to the right to maximize it). Click 'Resize/Move' to continue.

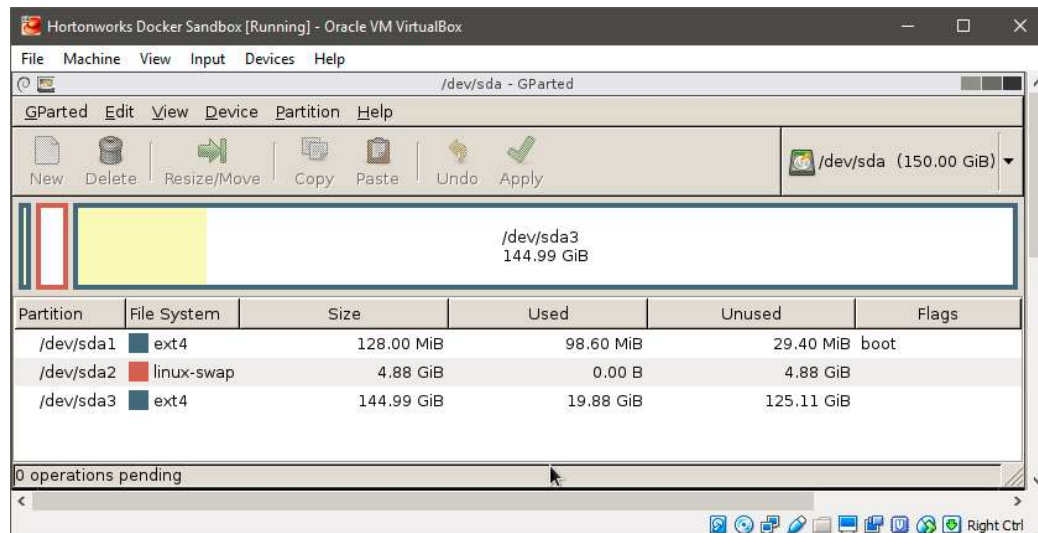


Back on the main screen, the repartition is pending but no permanent changes have been made -- note the 'operation pending' at bottom. Click the 'Apply' button and continue through to commit the change.



SIDE NOTE: gparted will expand the partition and will also run the required resize2fs commands, etc to complete the reconfig proper. (Previously for HDP 2.4 we had to do these additional steps ourselves since those filesystems were LVM based and not ext4.)

If all goes well the final result will be the following with /dev/sda3 having absorbed all the previously 'unallocated space'. You can quit gparted and shutdown the VM.





## **Part 5: Reconfigure the sandbox VM in VirtualBox to boot from the VDI disk (instead of the gparted ISO):**

Earlier (in part 3), we configured the VM to boot off the gparted ISO. Now we have to undo that and switch it back to use the newly prepped VDI disk instead:

- a) Make sure the VM is shutdown -- i.e: you've quit gparted from earlier and VM is shutdown.
- b) Bring up the VM settings and click on Storage.
- d) Select the 'optical drive' (might be empty or might have the gparted ISO) in the Storage Tree.
- e) Click the [ - ] button beneath the Storage Tree and remove the optical drive entirely.

And optionally, revert the boot-order change:

- a) In the VM settings, click on System
- b) Select the 'Hard Drive' option in the Boot Order list.
- c) Use the up/down arrows beside the Boot Order list to move the 'Hard Drive' to be the first in the list.

At this point, your sandbox VM has the new resized VDI based "hard-drive" and will boot off it.

## **Part 6: Verify the resized disk**

To verify that the disk has been resized properly:

- a) Start the VM and it will launch the sandbox proper.
- b) Once the sandbox is running proper you can SSH into the sandbox (via <http://localhost:4200> or using your favorite SSH client on port 2222) as you would normally.
- c) Check the disk space by executing the commands 'df -h'. Note the /dev/sda3 size.

```
[root@sandbox ~]# df -h
Filesystem      Size  Used Avail Use% Mounted on
rootfs          143G   18G  118G   13% /
overlay          143G   18G  118G   13% /
tmpfs            5.8G     0   5.8G    0% /dev
tmpfs            5.8G     0   5.8G    0% /sys/fs/cgroup
/dev/sda3        143G   18G  118G   13% /hadoop
/dev/sda3        143G   18G  118G   13% /etc/resolv.conf
/dev/sda3        143G   18G  118G   13% /etc/hostname
/dev/sda3        143G   18G  118G   13% /etc/hosts
shm              64M     0   64M    0% /dev/shm
```

d) You can check the partition sizes using 'lsblk' as well. Note the sda3 size.

```
[root@sandbox ~]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda          8:0    0  150G  0 disk
├─sda1       8:1    0   128M  0 part
├─sda2       8:2    0    4.9G  0 part [SWAP]
└─sda3       8:3    0   145G  0 part /hadoop
```

#### NOTE1:

Unlike with older HDP 2.4 sandboxes, there is no need for any LVM commands (lvextend) or resize2fs. The HDP 2.5 sandbox is built differently using docker and doesn't use LVM. Furthermore, the resize2fs step was handled by gparted (since the file system format is ext3 and not LVM).

#### NOTE2:

The HDP 2.5 sandbox setup(CentOS7 host + Docker + CentOS6.8 guest + Hortonworks software) doesn't require any additional changes for the disk resize to be visible in the sandbox. The resize is picked up and is transparently visible to the CentOS6.8 running in docker and thus Hortonworks software.

#### NOTE3:

The software layers in the HDP 2.5 'Hortonworks Docker Sandbox' is (more or less) as follows:

- VirtualBox VM which runs ...
  - CentOS 7.2 Linux which hosts ...
    - Docker which then hosts ...
      - CentOS 6.8 Linux which then hosts ...
        - HortonWorks software (HDFS, Ambar, etc)
        - at this level, the disks are whatever Docker makes available
        - when you SSH into the box (e.g: <http://localhost:4200>) you're SSHing into this Linux
      - Docker in turn only sees what the parent CentOS 7.2 makes available + configuration

While HDP 2.4 had the following layers:

- VirtualBox VM which runs ...
  - CentOS 6.7 Linux which hosts ...
    - HortonWorks software (HDFS, Ambari, etc)
    - the disks managed with LVM at the CentOS level.