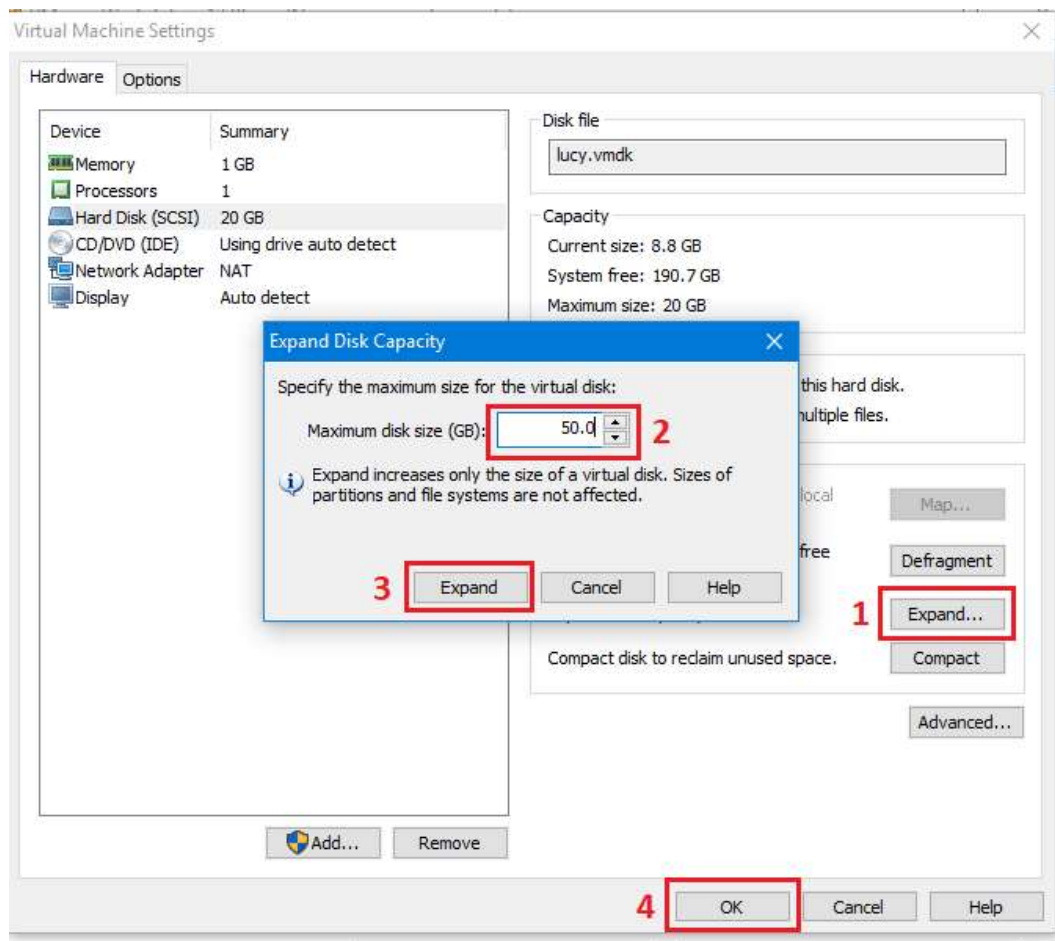


Extending a logical volume in VMWare machine

This article provides steps for extending the root partition residing in a logical volume created with Logical Volume Manager (LVM) in a virtual machine running Lucy.

Caution: We recommend to take a complete backup of the virtual machine prior to making these changes.

1. Power off the virtual machine.
2. Edit the virtual machine settings and extend the virtual disk size.



For more information, see [Increasing the size of a virtual disk \(1004047\)](#).

3. Power on the virtual machine.

4. Print the partition table to verify the number of partitions by running the command:

```
# fdisk -l
```

By default, there are 3: **sda1**, **sda2** and **sda5**.

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1	*	2048	499711	248832	83	Linux
/dev/sda2		501758	41940991	20719617	5	Extended
/dev/sda5		501760	41940991	20719616	8e	Linux LVM

4. Create a new primary partition - **sda3**:

a) Run the command:

```
# fdisk /dev/sda
```

b) Press **<n>** to create a new primary partition.

c) Press **<p>** for primary.

```
Partition type:
 p   primary (1 primary, 1 extended, 2 free)
 l   logical (numbered from 5)
Select (default p): p
```

d) Press **<3>** for the partition number.

e) Press **<Enter>** two times.

```
Partition number (1-4, default 3): 3
First sector (499712-104857599, default 499712):
Using default value 499712
Last sector, +sectors or +size{K,M,G} (499712-501757, default 501757):
Using default value 501757
```

f) Press **<t>** to change the system's partition ID.

g) Press **<3>** to select the newly creation partition.

h) Type **8e** to change the Hex Code of the partition for Linux LVM.

i) Press **<w>** to write the changes to the partition table.

```
Command (m for help): t
Partition number (1-5): 3
Hex code (type L to list codes): 8e
Changed system type of partition 3 to 8e (Linux LVM)

Command (m for help): w
The partition table has been altered!
```

5. Restart the virtual machine:

```
# shutdown -r now
```

7. Verify whether **sda3** has successfully created, by running the command:

```
# fdisk -l
```

```
root@phishing:~# fdisk -l
Disk /dev/sda: 53.7 GB, 53687091200 bytes
255 heads, 63 sectors/track, 6527 cylinders, total 104857600 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0008d718

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1  *          2048       499711     248832   83   Linux
/dev/sda2                501758     41940991    20719617   5   Extended
/dev/sda3                499712         501757         1023   8e   Linux LVM
/dev/sda5                501760     41940991    20719616   8e   Linux LVM
```

8. Create another primary partition **sda4**:

a) Run the command:

```
# fdisk /dev/sda
```

b) Press **<n>** to create a new primary partition.

c) Press **<p>** for primary.

```
Partition type:
 p   primary (2 primary, 1 extended, 1 free)
 1   logical (numbered from 5)
Select (default p): p
Selected partition 4
```

Note. The number of partition **<4>** was selected automatically.

d) Press **<Enter>** two times.

```
First sector (41940992-104857599, default 41940992):
Using default value 41940992
Last sector, +sectors or +size{K,M,G} (41940992-104857599, default 104857599):
Using default value 104857599
```

e) Press **<t>** to change the system's partition ID.

f) Press **<4>** to select the newly creation partition.

g) Type **8e** to change the Hex Code of the partition for Linux LVM.

```
Command (m for help): t
Partition number (1-5): 4
Hex code (type L to list codes): 8e
Changed system type of partition 4 to 8e (Linux LVM)
```

h) Press **<w>** to write the changes to the partition table.

9. Restart the virtual machine once again:

```
# shutdown -r now
```

10. Verify whether **sda4** has successfully created, by running the command:

```
# fdisk -l
```

```
root@phishing:~# fdisk -l
Disk /dev/sda: 53.7 GB, 53687091200 bytes
255 heads, 63 sectors/track, 6527 cylinders, total 104857600 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x0008d718

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1  *          2048       499711     248832   83   Linux
/dev/sda2                501758     41940991    20719617   5   Extended
/dev/sda3                499712       501757        1023   8e   Linux LVM
/dev/sda4                41940992    104857599    31458304   8e   Linux LVM
/dev/sda5                501760     41940991    20719616   8e   Linux LVM
```

11. Run this command to convert the new partition to a physical volume:

```
# pvcreate /dev/sda4
```

```
root@phishing:~# pvcreate /dev/sda4
Writing physical volume data to disk "/dev/sda4"
Physical volume "/dev/sda4" successfully created
```

12. Run this command to extend the physical volume:

```
# vgextend phishing /dev/sda4
```

```
root@phishing:~# vgextend phishing /dev/sda4
Volume group "phishing" successfully extended
```

13. Run this command to verify how many physical extents are available to the Volume Group:

```
# vgsdisplay phishing | grep "Free"
```

```
root@phishing:~# vgsdisplay phishing | grep "Free"
Free PE / Size          7680 / 30.00 GiB
```

14. Run the following command to extend the Logical Volume:

```
# lvextend -L+#G /dev/phishing/root
```

Where **<#>** is the number of Free space in GB available as per the previous command. Use the full number output from Step 13 including any decimals.

```
root@phishing:~# lvextend -L+30.00G /dev/phishing/root
Extending logical volume root to 48.91 GiB
Logical volume root successfully resized
```

15. Run the following command to expand the ext3 filesystem online, inside of the Logical Volume:

```
# resize2fs /dev/phishing/root
```

```
root@phishing:~# resize2fs /dev/phishing/root
resize2fs 1.42.5 (29-Jul-2012)
Filesystem at /dev/phishing/root is mounted on /; on-line resizing required
old_desc_blocks = 2, new_desc_blocks = 4
Performing an on-line resize of /dev/phishing/root to 12820480 (4k) blocks.
The filesystem on /dev/phishing/root is now 12820480 blocks long.
```

16. Run the following command to verify that the / filesystem has the new space available:

```
# df -h
```

```
root@phishing:~# df -h
Filesystem      Size  Used Avail Use% Mounted on
rootfs          49G   4.5G  42G   10% /
udev            10M     0   10M    0% /dev
tmpfs           101M  236K  101M    1% /run
/dev/mapper/phishing-root 49G   4.5G  42G   10% /
tmpfs           5.0M     0   5.0M    0% /run/lock
tmpfs           202M     0  202M    0% /run/shm
/dev/sda1       228M   17M  200M    8% /boot
```