How to increase Ubuntu 18.04 partitions after VPS upgrade

Firstly let's talk about what a partition is. A **disk partition** or **partition** is a section of the hard drive that is separated from other segments. Partitions enable users to divide a physical disk into logical sections. For example, allowing multiple operating systems to run on the same device.

Increasing the size of the `/` partition

Step 0 - Updating your system

Start by updating and upgrading your system by running the usual two apt commands

```
root@ubuntu:~# sudo apt update
...
root@ubuntu:~# sudo apt upgrade
```

Step 1 - Finding out the swap space.

By running the command `fdisk -l` we are able to find all the partitions. In this example we have a 50GB drive with 4GB of swap space, and we want to add an extra 100GB to our partition.

```
Disk /dev/vda: 50 GiB, 53687091200 bytes, 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
Disklabel type: dos
```

```
Disk identifier: 0x0041f8a8

Device     Boot    Start       End  Sectors Size Id Type
/dev/vda1           2048  96471039 96468992  46G 83 Linux
/dev/vda2       96471040 104857599  8386560   4G 82 Linux swap / Solaris
```

There is no need to reboot the server.

Step 2 - Turning off swap space.

In order to be able to increase the / partition you firstly need to turn off the swap space so make sure you are able to operate without it for a couple of minutes. To do that run the command

```
root@ubuntu:~# swapoff -a
```

Step 3 - Delete the swap partition

Start by running the command `fdisk /dev/vda` (Remember to switch it out for your own drive), and delete both partitions.

```
root@ubuntu:~# fdisk /dev/vda

Command (m for help): d
Partition number (1,2, default 2):

Partition 2 has been deleted.

Command (m for help): d
Selected partition 1
Partition 1 has been deleted.
```

Step 4 - Remaking the partitions

Step 4.1 - Remaking the original partition

We used to have 4GB of swap space, so we will need to keep at least that much for swap. Use the command `n` and then `p` to create a primary partition. Use the default value for the first sector of 2048. Then enter the size of the partition, for example `+96G` for 96 GB.

```

```

```
Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-209715199, default 2048):
Last sector, +sectors or +size{K,M,G,T,P} (2048-209715199, default 209715199): +96G

Created a new partition 1 of type 'Linux' and of size 96 GiB.
```

Step 4.2 - Remaking the swap partition

Remaking the swap partition is a similar process to the primary one. Start by running the command `n` then `p` to make a new primary partition. You will be asked for the first and last sectors. Unless you want to make the swap partition bigger, using the default values for both is fine.

```
Command (m for help): n
Partition type
   p   primary (1 primary, 0 extended, 3 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (2-4, default 2): 2
First sector (201328640-209715199, default 201328640):
Last sector, +sectors or +size{K,M,G,T,P} (201328640-209715199, default 209715199):

Created a new partition 2 of type 'Linux' and of size 4 GiB.
```

After doing that we need to change the partition type since it was originally supposed to be `Linus swap / Solaris` as seen in the first steps. To do that we need to run the command `t` followed by the partition number (in our case 2), and type the right partition type. In order to list all partition types you may press L.

```
Command (m for help): t
Partition number (1,2, default 2): 2
Partition type (type L to list all types): L

 0  Empty           24  NEC DOS         81  Minix / old Lin bf  Solaris
 1  FAT12           27  Hidden NTFS Win 82  Linux swap / So c1  DRDOS/sec (FAT-
 2  XENIX root      39  Plan 9          83  Linux           c4  DRDOS/sec (FAT-
```

```
 3  XENIX usr       3c  PartitionMagic  84  OS/2 hidden or  c6  DRDOS/sec (FAT-
 4  FAT16 <32M      40  Venix 80286     85  Linux extended  c7  Syrinx
 5  Extended        41  PPC PReP Boot   86  NTFS volume set da  Non-FS data
... There are more partition types here, run L on your machine for all available ones.
1c  Hidden W95 FAT3 75  PC/IX           bc  Acronis FAT32 L fe  LANstep
1e  Hidden W95 FAT1 80  Old Minix       be  Solaris boot    ff  BBT

Partition type (type L to list all types): 82
```

After which you are shown the message

```
Changed type of partition 'Linux' to 'Linux swap / Solaris'.
```

Step 5 - Finishing up

Save your work by running the `w` command inside fdisk

```
Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Re-reading the partition table failed.: Device or resource busy

The kernel still uses the old table. The new table will be used at the next reboot or after
you run partprobe(8) or kpartx(8).
```

In order to not reboot the machine we will be running the `partprobe` command in order to refresh the table for the kernel.

```
root@ubuntu:~# apt install parted
root@ubuntu:~# partprobe
```

After being redirected to the prompt with no output, we need to resize `/dev/vda1`

```
root@ubuntu:~# resize2fs /dev/vda1
resize2fs 1.42.12 (29-Aug-2014)
Filesystem at /dev/vda1 is mounted on /; on-line resizing required
old_desc_blocks = 2, new_desc_blocks = 3
```

And reinitialize `/dev/vda2` as the new swap location.

```

```

```
root@ubuntu:~# mkswap /dev/vda2
Setting up swapspace version 1, size = 4193276 KiB
no label, UUID=2e2fa78e-0f45-48eb-a737-ddb79b5f8599
```

Finally edit `/etc/fstab` and swap out the UUID for swap with the new one

```
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
UUID=73290e27-1372-4a5b-88e7-21905822c47e /               ext4    errors=remount-ro 0       1
/dev/fd0        /media/floppy0  auto    rw,user,noauto,exec,utf8 0       0
UUID=2e2fa78e-0f45-48eb-a737-ddb79b5f8599       none    swap    sw      0       0
```

After editing the `etc/fstab` we need to re-enable swap.

```
root@ubuntu:~# swapon -a
```

Step 6 - Verifying your work

We can verify the validity of our resizing using the commands `df` or `fdisk`

```
Device     Boot     Start       End   Sectors Size Id Type
/dev/vda1             2048 201328639 201326592  96G 83 Linux
/dev/vda2       201328640 209715199   8386560   4G 82 Linux swap / Solaris
```

And that's it. We increased the size of our / partition without having to reboot our machine.

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