

Ubuntu - Extend Your Default LVM Space

So, like me, you installed Ubuntu and accepted the default use of lvm and now your operating volume is very small and the Ubuntu installer did not utilize the entire physical drive. There is a ton of space that is not being utilized. And, possibly, your freshly installed cloud application (NextCloud) will soon exceed the allotted space within the first week or so as a result of data uploading or synchronization.

All credit goes to the publishers of this article:

<https://packetpushers.net/ubuntu-extend-your-default-lvm-space/>

This first example involves a 1TB physical drive of which Ubuntu's default partitioning only allotted 98GB to the operating volume shown as 'ubuntu-vg-ubuntu-lv' below.

First run df -h

```
$ df -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
tmpfs	791M	1.2M	790M	1%	/run
/dev/mapper/ubuntu--vg-ubuntu--lv	98G	7.0G	86G	8%	/
tmpfs	3.9G	0	3.9G	0%	/dev/shm
tmpfs	5.0M	0	5.0M	0%	/run/lock
/dev/sda2	2.0G	130M	1.7G	8%	/boot
tmpfs	791M	4.0K	791M	1%	/run/user/1000

Next run vgdisplay

```
user@svr1:~$ sudo vgdisplay
```

```
[sudo] password for user:
```

```
--- Volume group ---
VG Name          ubuntu-vg
System ID
Format           lvm2
Metadata Areas   1
Metadata Sequence No 2
VG Access        read/write
VG Status        resizable
MAX LV           0
Cur LV          1
Open LV          1
Max PV           0
Cur PV          1
Act PV           1
VG Size          <929.00 GiB
PE Size          4.00 MiB
Total PE         237823
```

```
Alloc PE / Size      25600 / 100.00 GiB
Free  PE / Size      212223 / <829.00 GiB
VG UUID              rF3fw2-13h2-kAiL-aeWA-KyDZ-5HQU-GwvKDe
```

Next run `lvdisplay`

```
user@svr1:~$ sudo lvdisplay
```

```
--- Logical volume ---
LV Path                /dev/ubuntu-vg/ubuntu-lv
LV Name                ubuntu-lv
VG Name                ubuntu-vg
LV UUID                xUUIxr-wnDl-7Znk-EQpK-gAwb-Wug0-a7JSTb
LV Write Access        read/write
LV Creation host, time ubuntu-server, 2023-06-28 23:21:26 +0000
LV Status               available
# open                  1
LV Size                 100.00 GiB
Current LE              25600
Segments                1
Allocation              inherit
Read ahead sectors      auto
 - currently set to    256
Block device            253:0
```

Switching to root user

```
user@svr1:~$ sudo su
root@svr1:/home/user# cd
root@svr1:~#
```

Run the following to extend the LV to the maximum size usable.

```
root@svr1:~# lvextend -l +100%FREE /dev/ubuntu-vg/ubuntu-lv
```

```
Size of logical volume ubuntu-vg/ubuntu-lv changed from 100.00 GiB (25600
extents) to <929.00 GiB (237823 extents).
Logical volume ubuntu-vg/ubuntu-lv successfully resized.
root@svr1:~#
```

Run `lvdisplay` once more to verify that that the logical volume was successfully resized.

```
root@svr1:~# lvdisplay
--- Logical volume ---
LV Path                /dev/ubuntu-vg/ubuntu-lv
LV Name                ubuntu-lv
VG Name                ubuntu-vg
LV UUID                xUUIxr-wnDl-7Znk-EQpK-gAwb-Wug0-a7JSTb
LV Write Access        read/write
```

```
LV Creation host, time ubuntu-server, 2023-06-28 23:21:26 +0000
LV Status          available
# open            1
LV Size           <929.00 GiB
Current LE        237823
Segments          1
Allocation        inherit
Read ahead sectors auto
- currently set to 256
Block device      253:0
```

```
root@svr1:~#
```

At this point you have increased the size of the block volume where your root filesystem resides, but you still need to extend the filesystem on top of it.

First, run `df -h` to verify your (almost full) root file system, then run `resize2fs /dev/mapper/ubuntu-vg-ubuntu-lv` to extend your filesystem, and run `df -h` one more time to make sure you're successful.

This is a continuation of the above: now extending the file system to utilize the entire resized volume on a 1TB physical drive.

Re-established remote ssh connection and want to again switch to root user.

```
~$ sudo su
[sudo] password for user:
root@svr1:/home/user# cd
```

Run `df -h` to see where we are. Notice that `ubuntu-vg-ubuntu-lv` is still only 98G. We still need to extend the filesystem to match the resized LV.

```
root@svr11:~# df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           791M  1.2M  790M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv 98G   7.0G   86G   8% /
tmpfs           3.9G     0  3.9G   0% /dev/shm
tmpfs           5.0M     0  5.0M   0% /run/lock
/dev/sda2       2.0G  130M  1.7G   8% /boot
tmpfs           791M  4.0K  791M   1% /run/user/1000
```

Let's check `vgdisplay`

```
root@svr1:~# vgdisplay

--- Volume group ---
VG Name          ubuntu-vg
System ID
Format           lvm2
Metadata Areas   1
Metadata Sequence No 3
VG Access        read/write
```

```
VG Status          resizable
MAX LV            0
Cur LV           1
Open LV           1
Max PV            0
Cur PV           1
Act PV            1
VG Size           <929.00 GiB
PE Size           4.00 MiB
Total PE          237823
Alloc PE / Size   237823 / <929.00 GiB
Free PE / Size    0 / 0
VG UUID           rF3fw2-13h2-kAiL-aeWA-KyDZ-5HQU-GwvKDe
```

Let's check `lvdisplay`

```
root@svr1:~# lvdisplay
```

```
--- Logical volume ---
LV Path            /dev/ubuntu-vg/ubuntu-lv
LV Name            ubuntu-lv
VG Name            ubuntu-vg
LV UUID            xUUIxr-wnDl-7ZNk-EQpK-gAwb-Wug0-a7JSTb
LV Write Access    read/write
LV Creation host, time ubuntu-server, 2023-06-28 23:21:26 +0000
LV Status          available
# open             1
LV Size            <929.00 GiB
Current LE         237823
Segments           1
Allocation         inherit
Read ahead sectors auto
- currently set to 256
Block device       253:0
```

Now, run the following command to resize the file system to the full size of the resized volume.

```
root@svr1:~# resize2fs /dev/mapper/ubuntu--vg-ubuntu--lv
resize2fs 1.46.5 (30-Dec-2021)
Filesystem at /dev/mapper/ubuntu--vg-ubuntu--lv is mounted on /; on-line
resizing required
old_desc_blocks = 13, new_desc_blocks = 117
The filesystem on /dev/mapper/ubuntu--vg-ubuntu--lv is now 243530752 (4k)
blocks long.

root@svr1:~#
```

Run `df -h`

And notice that 'ubuntu-vg-ubuntu-lv' is now 914G

```
root@svr1:~# df -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
tmpfs	791M	1.2M	790M	1%	/run
/dev/mapper/ubuntu--vg-ubuntu--lv	914G	7.0G	869G	1%	/
tmpfs	3.9G	0	3.9G	0%	/dev/shm
tmpfs	5.0M	0	5.0M	0%	/run/lock
/dev/sda2	2.0G	130M	1.7G	8%	/boot
tmpfs	791M	4.0K	791M	1%	/run/user/1000

```
root@svr1:~#
```

End of resizing on the 1TB physical drive. IF EVERYTHING WENT WELL, THEN STOP HERE.

FOLLOWING IS ANOTHER UNRELATED EXAMPLE OF THE SECOND PART OF THE PROCESS:

Example 2:

Note: The following operations and output involves a 2TB physical drive instead of 1TB (like above). This is a different server where **only the second part of this resizing job is depicted below**, likewise properly finished by extending the file system on top of the block volume that you just extended.

Again, at this point we have increased the size of the block volume where your root filesystem resides, but you still need to extend the filesystem on top of it.

First, run `df -h` to verify your (almost full) root file system, then run `resize2fs /dev/mapper/ubuntu-vg-ubuntu-lv` to extend your filesystem, and run `df -h` one more time to make sure you're successful.

Here are the new readings for 'svr3' (using a pair of 2TB Drives on a hardware RAID-1 Array - which matters not.)

```
Logical volume ubuntu-vg/ubuntu-lv successfully resized.
root@svr3:~# lvsdisplay
--- Logical volume ---
LV Path                /dev/ubuntu-vg/ubuntu-lv
LV Name                 ubuntu-lv
VG Name                 ubuntu-vg
LV UUID                 0FjNEm-jrLm-tYWv-AzHT-TZmm-l9bx-aVWpyR
LV Write Access         read/write
LV Creation host, time ubuntu-server, 2023-06-18 18:42:52 +0000
LV Status                available
# open                  1
LV Size                 <1.82 TiB
Current LE              476287
Segments                1
Allocation              inherit
Read ahead sectors      auto
- currently set to     256
Block device            253:0

root@svr3:~# df -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
tmpfs	1.6G	1.2M	1.6G	1%	/run
/dev/mapper/ubuntu--vg-ubuntu--lv	98G	12G	82G	13%	/
tmpfs	7.8G	0	7.8G	0%	/dev/shm
tmpfs	5.0M	0	5.0M	0%	/run/lock
/dev/sda2	2.0G	253M	1.6G	14%	/boot
tmpfs	1.6G	4.0K	1.6G	1%	/run/user/1000

Now, run the following command to extend your filesystem.

```
root@svr3:~# resize2fs /dev/mapper/ubuntu--vg-ubuntu--lv
```

Results

```
resize2fs 1.46.5 (30-Dec-2021)
Filesystem at /dev/mapper/ubuntu--vg-ubuntu--lv is mounted on /; on-line
resizing required
old_desc_blocks = 13, new_desc_blocks = 233
The filesystem on /dev/mapper/ubuntu--vg-ubuntu--lv is now 487717888 (4k)
blocks long.
```

Run df -h again.

```
root@svr3:~# df -h
Filesystem              Size  Used Avail Use% Mounted on
tmpfs                   1.6G  1.2M  1.6G   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv 1.8T   12G  1.8T   1% /
tmpfs                   7.8G     0  7.8G   0% /dev/shm
tmpfs                   5.0M     0  5.0M   0% /run/lock
/dev/sda2               2.0G  253M  1.6G  14% /boot
tmpfs                   1.6G   4.0K  1.6G   1% /run/user/1000
root@nc3:~#
```

Run vgdisplay again

```
root@svr3:~# vgdisplay
--- Volume group ---
VG Name                ubuntu-vg
System ID
Format                 lvm2
Metadata Areas         1
Metadata Sequence No  3
VG Access              read/write
VG Status              resizable
MAX LV                 0
Cur LV                1
Open LV                1
Max PV                 0
Cur PV                1
```

```
Act PV          1
VG Size        <1.82 TiB
PE Size        4.00 MiB
Total PE       476287
Alloc PE / Size 476287 / <1.82 TiB
Free PE / Size  0 / 0
VG UUID        bK42QC-L9pu-bEiA-ndU0-j3v7-3XWU-tA06R5
```

Run `lvdisplay` again

```
root@svr3:~# lvdisplay
--- Logical volume ---
LV Path          /dev/ubuntu-vg/ubuntu-lv
LV Name          ubuntu-lv
VG Name          ubuntu-vg
LV UUID          0FjNEm-jrLm-tYWv-AzHT-TZmm-l9bx-aVWpyR
LV Write Access  read/write
LV Creation host, time ubuntu-server, 2023-06-18 18:42:52 +0000
LV Status        available
# open          1
LV Size         <1.82 TiB
Current LE       476287
Segments        1
Allocation       inherit
Read ahead sectors auto
- currently set to 256
Block device     253:0

root@svr3:~#
```

VG Size and LV Size are both <1.82 TiB

I believe we're done here.

From:
<https://installconfig.com/> - Install Config Wiki

Permanent link:
https://installconfig.com/doku.php?id=ubuntu_extend_default_lvm_space&rev=1688068681

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