

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 free 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 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

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

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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          xUIxr-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 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          xUIxr-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

```

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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	xUIxr-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

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:~# 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:~# df -h
```

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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
Cur LV
Open LV
Max PV
Cur PV
```

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://www.installconfig.com/> - Install Config Wiki

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