Expand root partition

Your root filesystem is full and you can’t install any apps anymore? This guide will provide several options to gain extra space to your root partition.

- The options for increasing the space
- Use the space from an unused partition
- Increase the root partition size with an SD-card

The options for increasing the space

There are several options to increase the space of the root partitions. Currently available options are:

1. Use the space from a unused partition (Not on Xperia X). This option has the drawback that if you want to reflash your device with SailfishOS, the flashing won't work, you need to restore the partition first, e.g. by flashing Android.
2. Shrink the home partition and add this space to the root partition. This means you have less space available on the user parition afterwards.
3. Configure an SD-card to extend your root partition. Your SD-Card has to be inserted all the time for the device to work.

Use the space from an unused partition

Overview

Most Sailfish X devices have a partition left over from Android which is completely unused. Newer Android phones have partitions labelled system_a and system_b, which were used by deliver OS updates as full partitions without overwriting the used one. On next reboot, Android just switches the partition to boot from. SailfishOS only uses system_b, as it doesn't provide kernel updates.

This does only work on devices with a `/dev/disk/by-partlabel/system_a` and a `/dev/disk/by-partlabel/system_b` partition, e.g. the Xperia XA2. It does not work on devices with only a `/dev/disk/by-partlabel/system` partition like the Xperia X!

Warning! 4.6.0.15 started to use the same system_a partition:

> Xperia XA2 and Xperia 10
>
> Partition opt2 was created to allow for more space for AppSupport on Sailfish 5.0.0 (but only if the partition is not already used).

This means that this is not necessary or, if you already used the system_a, you can't udpate through GUI but use command line.

Preparations

You need shell access and root access for this guide. You get shell access by enabling the development mode. You become root by executing `devel-su` and entering the password you set in the development mode settings. It's good to have a full system backup, e.g. with restic or borg.

Add the partition to LVM

To start, you have to add `/dev/disk/by-partlabel/system_a` to the Logical Volume Manager.

1. Enter `pvcreate /dev/disk/by-partlabel/system_a` to prepare the partition for LVM.
2. Secondly, type `vgextend sailfish /dev/disk/by-partlabel/system_a` to add the partition to the `sailfish` volume group.

If you get messages similar to this:

```
/dev/mmcblk0rpmb: read failed after 0 of 4096 at 4186112: Input/output error
```

Don’t worry. `mmcblk0rpmb` stands for *Replay Protected Memory Block*, which is a security storage feature of Android not used by SailfishOS. When the programs you just executed scan all partitions, they won’t be able to read this secure storage, hence the error message.

Extend the sailfish root filesystem

Now the space of the sailfish volume group is extended by the size of the `system_a` partition and we can continue with adding the new free space of the volume group to the root volume.

1. This is done with `lvextend sailfish/root -l +100%Free`, which tells LVM to assign all free space in the `sailfish` volume group to the `root` volume.
2. In the end, we resize the root filesystem to the new size of the `root` volume by entering `resize2fs /dev/mapper/sailfish-root`. This can be done while the filesystem is mounted, which is a nice feature of ext4.

Now you can proceed with installing apps or starting the system update.

Increase the root partition size with an SD-card

This guide adds the SD-card to the LVM volume group and then uses the new space in the LVM volume group to increase the root partition.