**Preparing a Linux Root Partition for Expansion**

**To prepare a Linux root partition for expansion**

1. If your primary instance is running, stop it. You cannot perform the rest of this procedure on a running instance.
2. Take a snapshot of your volume. It can be easy to corrupt or lose your data in the following procedures. If you have a fresh snapshot, you can always start over in case of a mistake and your data will still be safe. For more information.
3. Record the device name that the volume is attached to. You can find this information on the Root device field of the instance's details pane. The value is likely /dev/sda1 or /dev/xvda.
4. Detach the volume from the primary instance.
5. Attach the volume to another (secondary) instance in the same Availability Zone. If your EBS volume is encrypted, you must use a secondary instance that supports Amazon EBS encryption; otherwise, you can use a t2.micro instance for this procedure.
6. Log in to the secondary instance with SSH. For more information, Continue with the next procedure.

**To expand a Linux partition using parted**

1. Identify the device that contains the partition that you want to expand. Use the **lsblk** command to list all devices and partitions attached to the instance.

[ec2-user ~]$ lsblk

NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT

xvdf 202:80 0 100G 0 disk

└─xvdf1 202:81 0 8G 0 part /mnt

xvda1 202:1 0 30G 0 disk /

In this example, the xvdf device has 100 GiB of available storage and it contains an 8 GiB partition.

1. Unmount the partition if it is mounted. Run the **umount** command with the value of MOUNTPOINT from the **lsblk** command.
2. Run the **parted** command on the device (and not the partition on the device). Remember to add the /dev/ prefix to the name that **lsblk** outputs.

[ec2-user ~]$ sudo parted */dev/xvdf*

GNU Parted 2.1

Using /dev/xvdf

Welcome to GNU Parted! Type 'help' to view a list of commands.

1. Change the **parted** units of measure to sectors.

(parted) **unit s**

1. Run the **print** command to list the partitions on the device. For certain partition table types, you might be prompted to repair the partition table for the larger volume size. Answer 'Ignore' to any questions about fixing the existing partition table; you will create a new table later.

(parted) **print**

* 1. If you receive the following message, enter 'Ignore' to prevent the backup GPT location from changing.
  2. Error: The backup GPT table is not at the end of the disk, as it should be. This might mean that another operating
  3. system believes the disk is smaller. Fix, by moving the backup to the end (and removing the old backup)?

Fix/Ignore/Cancel? **Ignore**

* 1. If you receive the following message, enter 'Ignore' again to keep the space on the drive the same.
  2. Warning: Not all of the space available to /dev/xvdf appears to be used, you can fix the GPT to use all of the
  3. space (an extra 46137344 blocks) or continue with the current setting?

Fix/Ignore? **Ignore**

1. Examine the output for the total size of the disk, the partition table type, the number of the partition, the start point of the partition, and any flags, such as boot. For gpt partition tables, note the name of the partition; for msdos partition tables, note the Type field (primary or extended). These values are used in the upcoming steps.

The following is a gpt partition table example.

Model: Xen Virtual Block Device (xvd)

Disk /dev/xvdf: *209715200s*

Sector size (logical/physical): 512B/512B

Partition Table: *gpt*

Number Start End Size File system Name Flags

128 2048s 4095s 2048s BIOS Boot Partition bios\_grub

*1* *4096s* 16777182s 16773087s ext4 *Linux*

The following is an msdos partition table example.

Model: Xen Virtual Block Device (xvd)

Disk /dev/xvdg: *104857600s*

Sector size (logical/physical): 512B/512B

Partition Table: *msdos*

Number Start End Size Type File system Flags

1. *2048s* 35649535s 35647488s *primary* ext3
2. Delete the desired partition entry for the partition using the number (1) from the previous step.

(parted) **rm 1**

1. Create a new partition that extends to the end of the volume.

(For the gpt partition table example) Note the start point and name of partition 1 above. For the gpt example, there is a start point of 4096s, and the name Linux. Run the **mkpart** command with the start point of partition 1, the name, and 100% to use all of the available space.

(parted) **mkpart *Linux 4096s 100%***

(For the msdos partition table example) Note the start point and the partition type of partition 1 above. For the msdos example, there is a start point of 2048s and a partition type of primary. Run the **mkpart** command with a primary partition type, the start point of partition 1, and 100% to use all of the available space.

(parted) **mkpart *primary 2048s 100%***

1. Run the **print** command again to verify your partition.

(For the gpt partition table example)

(parted) **print**

Model: Xen Virtual Block Device (xvd)

Disk /dev/xvdf: 209715200s

Sector size (logical/physical): 512B/512B

Partition Table: gpt

Number Start End Size File system Name Flags

128 2048s 4095s 2048s BIOS Boot Partition bios\_grub

1 4096s 209713151s 209709056s ext4 Linux

(For the msdos partition table example)

(parted) **print**

Model: Xen Virtual Block Device (xvd)

Disk /dev/xvdg: 104857600s

Sector size (logical/physical): 512B/512B

Partition Table: msdos

Number Start End Size Type File system Flags

1. 2048s 104857599s 104855552s primary ext3
2. Check to see that any flags that were present earlier are still present for the partition that you expanded. In some cases the boot flag may be lost. If a flag was dropped from the partition when it was expanded, add the flag with the following command, substituting your partition number and the flag name. For example, the following command adds the boot flag to partition 1.

(parted) set *1* *boot* on

You can run the **print** command again to verify your change.

1. Run the **quit** command to exit **parted**.

(parted) **quit**

Note

Because you removed a partition and added a partition, **parted** may warn that you may need to update /etc/fstab. This is only required if the partition number changes.

1. Check the file system to make sure there are no errors (this is required before you may extend the file system). Note the file system type from the previous **print** commands. Choose one of the commands below based on your file system type; if you are using a different file system, consult the documentation for that file system to determine the correct check command.

(For ext3 or ext4 file systems)

[ec2-user ~]$ **sudo e2fsck -f */dev/xvdf1***

e2fsck 1.42.3 (14-May-2012)

Pass 1: Checking inodes, blocks, and sizes

Pass 2: Checking directory structure

Pass 3: Checking directory connectivity

Pass 4: Checking reference counts

Pass 5: Checking group summary information

/: 31568/524288 files (0.4% non-contiguous), 266685/2096635 blocks

(For xfs file systems)

[ec2-user ~]$ **sudo xfs\_repair */dev/xvdf1***

Phase 1 - find and verify superblock...

Phase 2 - using internal log

- zero log...

- scan filesystem freespace and inode maps...

- found root inode chunk

Phase 3 - for each AG...

- scan and clear agi unlinked lists...

- process known inodes and perform inode discovery...

- agno = 0

- agno = 1

- agno = 2

- agno = 3

- process newly discovered inodes...

Phase 4 - check for duplicate blocks...

- setting up duplicate extent list...

- check for inodes claiming duplicate blocks...

- agno = 0

- agno = 1

- agno = 2

- agno = 3

Phase 5 - rebuild AG headers and trees...

- reset superblock...

Phase 6 - check inode connectivity...

- resetting contents of realtime bitmap and summary inodes

- traversing filesystem ...

- traversal finished ...

- moving disconnected inodes to lost+found ...

Phase 7 - verify and correct link counts...

done

1. Remove the disk from the server which you expended the disk.
2. Reattach it to the original server
3. Run lsblk again to view volume info and df –h, if the value on df –j is still as before run the following command for example: resize2fs /dev/sda1 .

Run df –h again to see the change.