Moving usr from root [/] to a different partition on Red Hat Enterprise Linux

SOLUTION VERIFIED - Updated March 19 2024 at 2:34 AM - English

Environment

Red Hat Enterprise Linux 8
Red Hat Enterprise Linux 7

Issue

- Moving usr from root [/] to a different partition on Red Hat Enterprise Linux.
- How to move the contents of /usr directory to a separate LVM?

Resolution

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Important:*Take a complete backup before starting this activity and test these steps in a test environment first.*

Related Document: Refer to
- Migrating /usr from root[/] to separate partition
- Why does Red Hat Enterprise Linux 6 to 7 in-place upgrade fail if /usr is on separate partition ?

Warning: *Perform the activity in rescue mode.*

1. Check for available space:

```
# vgdisplay
# fdisk -l
```

In case you don't have space available on the existent volume group, add a new disk or new partition.

2. Initialize the new disk or partition for use by LVM (in this case we are using `/dev/sdb` as an example name):

```
# pvcreate /dev/sdb1
```

3. Create a volume group:

```
# vgcreate vg_newVolumeName /dev/sdb1
```

4. Display attributes of volume group and check the space available `Free PE / Size` :

```
# vgdisplay vg_newVolumeName
```

5. Create a logical volume in `vg_newVolumeName` . The following will create the new logical volumes for `lv_usr` (adjust the size accordingly with your needs):

```
# lvcreate -L 6G --name lv_usr vg_newVolumeName
```

6. Creating the file system for `lv_usr` :

```
# mkfs.xfs /dev/mapper/vg_newVolumeName-lv_usr
```

Note: Now you have the LVM ready, a few more steps to move `/usr` .

7. Mount `/usr` LV on temporary directory and copy the content of `/usr` into it:

```
# mkdir /tmp/usrtmp
# mount /dev/mapper/vg_newVolumeName-lv_usr /tmp/usrtmp
# rsync -avz /usr/ /tmp/usrtmp/
```

Note: If the source filesystem has sparse file then the above `rsync` command might fail hence use option `-S` with `rsync` command which will efficiently copy the sparse file on destination filesystem.

9. Check if the temporary directory matches the original directory:

```
# diff /usr/ /tmp/usrtmp/
# ls -la /usr/
# ls -la /tmp/usrtmp/
# du /usr/
# du /tmp/usrtmp/
```

`du` shows the size in bytes

13. If everything looks correct until here, mount filesystem persistent across a reboot.

This command will show you the UUID for `lv_usr` :

```
# blkid
```

Take a note for the output.

Edit the file `/etc/fstab` adding the lines:

```
UUID=example-UUID-for-lv_usr  /usr   xfs   defaults 0 0
```

Note: Make sure to inform the `UUID` accordingly with the `blkid` output:

Remember to double check the paths and also the filesystem type, such as EXT4, XFS accordingly with your system, the above are examples only.

14. Restore selinux context :

```
# restorecon -vvFR /usr
```

15. Add VG/LV names in `/etc/default/grub` :
It is important to add an activation of the new LV on the grub command line. This is done via rd.lvm.lv parameter.

```
GRUB_CMDLINE_LINUX="crashkernel=auto  rd.lvm.lv=rhel/root rd.lvm.lv=rhel/swap
rd.lvm.lv=vg_newVolumeName/usrlv rhgb quiet"
```

Note: The reason why the `/usr` file system needs to be explicitly configured in the `GRUB_CMDLINE_LINUX` parameter is explained in the following link: System is unable to boot after migrating /usr directory to a new file system

16. Generate a `grub2.cfg` file using `grub2-mkconfig` :

```
# grub2-mkconfig -o /boot/grub2/grub.cfg
```

17. Take backup of current initramfs file and rebuild initramfs image:

```
# cp /boot/initramfs-$(uname -r).img /boot/initramfs-$(uname -r).img.$(date +%m-%d-
%H%M%S).bak
# dracut -v -f /boot/initramfs-$(uname -r).img $(uname -r)
```

18. Once the system has booted successfully run & test the install application.

19. After verification again boot the system into rescue mode to remove old `/usr` content from `/` .

Product(s) **Red Hat Enterprise Linux** **Component** **lvm2** **systemd** **xfsprogs**

Category **Configure** **Tags** **file_systems** **lvm2** **systemd** **xfs**

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