LVM: Managing snapshots

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LVM: Managing snapshots

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# Tested on RHEL 6 & 7

# LVM allows to take read/write snapshots of a logical volume. An
snapshot consists of a
# point-in-time copy of a logical volume that can be written to
independently from the
# original volume.

# They can be used for backup purposes or test changes, for example.

# When a snapshot is created it points to the same block on disk as
the original but when
# a change is made to either the original or the snapshot, it will be
copied and snapshot
# will point to the copy instead.

# To store changes a snapshot is given an initial space. Once it has
used all the
# available space it will be turned 'inactive'. To avoid this, we can
configure snapshot
# to automatically extend the space available when a defined
threshold is reached.

# We can define following variables in
/etc/lvm/lvm.conf configuration file:
#     snapshot_autoextend_threshold
#     snapshot_autoextend_percent
#
# When usage goes above 'snapshot_autoextend_threshold' percent, it
will be grown by
# 'snapshot_autoextend_percent' of the original size. Once snapshot
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has reached the same
# size as the original logical volume it will stop being extended.
#
# lvm2-monitor service has to be restarted for changes to take effect


# Creating the snapshot of an existing logical volume

LV=lv_test          # Our existing logical volume
SNAP=lv_snapshot    # Snapshot
VG=datavg           # Volume group our logical volume belongs to
SIZE=256M           # Desired size for the snapshot - do your
calculations before ;)

lvcreate -s -n $SNAP -L $SIZE /dev/$VG/$LV


# To check how much space has been used in a snapshot, we can use lvs

lvs
  LV          VG     Attr      LSize     Pool   Origin    Data%  Move
Log Cpy%Sync Convert
  [...]
  lv_snapshot rootvg swi-a-s-- 256.00m          lv_test   0.01



# Snapshot cat be mounted to make modifications

mount /dev/$VG/$SNAP /mnt


# Once modifications done, we can merge changes to origin logical
volume (both original
# lv and snapshot should be unmounted, if not next time lv will be de-
activated and
# re-activated it will be synchronized). If changes may be discarded
we can 'lvremove'
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# snapshot

# NOTE: Use snapshot merging carefully; merging will discard any
change done to original
# logical volume after taking the snapshot
# Apart from that, one has to take into account that merging logical
volumes will
# definitely destroy snapshot.

umount /dev/$VG/$LV
umount /mnt

lvconvert --merge /dev/$VG/$SNAP
  Merging of volume lv_snapshot started.
  lv_test: Merged: 100.0%
  lv_test: Merged: 100.0%
  Merge of snapshot into logical volume lv_test has finished.
  Logical volume "lv_snapshot" successfully removed



# We may run merge in the background ('-b'). If the original volume
is in use, the merge
# will be started next time the original volume is activated.
Obviously merging a snapshot
# of the root file system requires a reboot of the server




# Example of snapshot
# ----------------------------------------------------------------
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# lvs rootvg/lv_test
  LV      VG     Attr      LSize   Pool Origin Data%  Move Log
Cpy%Sync Convert
  lv_test rootvg -wi-ao--- 256.00m
```

```
# ll /test/
total 12
-rw-r--r-- 1 root root     0 Aug  5 16:19 1.txt
-rw-r--r-- 1 root root     0 Aug  5 16:19 2.txt
drwx------ 2 root root 12288 Aug  5 16:06 lost+found

# lvcreate -s -n lv_snapshot -L 32M /dev/rootvg/lv_test
  Logical volume "lv_snapshot" created

# mount /dev/rootvg/lv_snapshot /mnt

# ll /mnt/
total 12
-rw-r--r-- 1 root root     0 Aug  5 16:19 1.txt
-rw-r--r-- 1 root root     0 Aug  5 16:19 2.txt
drwx------ 2 root root 12288 Aug  5 16:06 lost+found

# touch /mnt/3.txt
# touch /mnt/4.txt

# touch /test/5.txt

# ll /test/
total 12
-rw-r--r-- 1 root root     0 Aug  5 16:19 1.txt
-rw-r--r-- 1 root root     0 Aug  5 16:19 2.txt
-rw-r--r-- 1 root root     0 Aug  5 16:21 5.txt
drwx------ 2 root root 12288 Aug  5 16:06 lost+found

# ll /mnt/
total 12
-rw-r--r-- 1 root root     0 Aug  5 16:19 1.txt
-rw-r--r-- 1 root root     0 Aug  5 16:19 2.txt
-rw-r--r-- 1 root root     0 Aug  5 16:21 3.txt
-rw-r--r-- 1 root root     0 Aug  5 16:21 4.txt
drwx------ 2 root root 12288 Aug  5 16:06 lost+found

# lvs rootvg/lv_test rootvg/lv_snapshot
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  LV          VG     Attr      LSize   Pool Origin  Data%  Move Log
Cpy%Sync Convert
  lv_snapshot rootvg swi-aos--  32.00m      lv_test   0.12
  lv_test     rootvg owi-aos-- 256.00m

# umount /test
# umount /mnt

# lvconvert --merge /dev/rootvg/lv_snapshot
  Merging of volume lv_snapshot started.
  lv_test: Merged: 100.0%
  Merge of snapshot into logical volume lv_test has finished.
  Logical volume "lv_snapshot" successfully removed

# lvs rootvg/lv_test rootvg/lv_snapshot
  One or more specified logical volume(s) not found.
  LV      VG     Attr      LSize   Pool Origin Data%  Move Log
Cpy%Sync Convert
  lv_test rootvg -wi-a---- 256.00m

# mount /dev/rootvg/lv_test /test

# ll /test
total 12
-rw-r--r-- 1 root root     0 Aug  5 16:19 1.txt
-rw-r--r-- 1 root root     0 Aug  5 16:19 2.txt
-rw-r--r-- 1 root root     0 Aug  5 16:21 3.txt
-rw-r--r-- 1 root root     0 Aug  5 16:21 4.txt
drwx------ 2 root root 12288 Aug  5 16:06 lost+found


# Files 3.txt and 4.txt that were created on snapshot have been
merged to original LV.
# On the other hand file 5.txt, that was created on original LV after
having taken the
# snapshot, has been discarded during merge operation.
```