LVM: Create a new Logical Volume / Filesystem

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LVM: Create a new Logical Volume / Filesystem

```
# Tested on RHEL 5, 6 & 7


# Concatenated volume
# ------------------------------------------------------------------------
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MNTPT=/testmntpt
OWNER=testusr.testgrp
VG=testvg
LV=testlv
SIZE=512                    # Final size in MBytes
FSTYPE=ext3                 # ext4 can be created from RHEL 5 on


# LV creation. Size given in Mbytes. To specify size in Logical
Extents use '-l'

lvcreate -L ${SIZE}M -n $LV $VG
   Logical volume "testlv" created.


# Show new LV (note volume group is formed by three physical volumes
but only one of them
# has been used for the logical volume)

pvs | egrep "PFree|$VG"
   PV         VG     Fmt  Attr PSize    PFree
```

```
   /dev/sde1  testvg lvm2 a--  1020.00m  508.00m
   /dev/sde2  testvg lvm2 a--  1020.00m 1020.00m
   /dev/sde3  testvg lvm2 a--  1020.00m 1020.00m

lvdisplay -m /dev/$VG/$LV
   --- Logical volume ---
   LV Path                /dev/testvg/testlv
   LV Name                testlv
   VG Name                testvg
   LV UUID                nBmMJZ-VlHJ-8JYS-WEQ7-bHxi-kock-31aGZS
   LV Write Access        read/write
   LV Creation host, time myserver.localdomain, 2016-02-23 16:25:41
+0100
   LV Status              available
   # open                 0
   LV Size                512.00 MiB
   Current LE             128
   Segments               1
   Allocation             inherit
   Read ahead sectors     auto
   - currently set to     8192
   Block device           253:8

   --- Segments ---
   Logical extents 0 to 127:
     Type                linear
     Physical volume     /dev/sde1
     Physical extents    0 to 127


# Filesystem creation

mkfs -V -t $FSTYPE /dev/$VG/$LV

mkdir -p $MNTPT

mount /dev/$VG/$LV  $MNTPT
chown $OWNER $MNTPT
```

```
# Check

df -h $MNTPT
ls -ld $MNTPT


# Add output of following command to /etc/fstab
echo "/dev/$VG/$LV        $MNTPT               $FSTYPE
defaults         1 2"



# Stripped over several physical volumes
# ------------------------------------------------------------------------
-----------------------

MNTPT=/testmntpt
OWNER=testusr.testgrp
VG=testvg
LV=testlv
SIZE=512                    # Final size in MBytes
FSTYPE=ext3                 # ext4 can be created from RHEL 5 on
STRIPES=2                   # Number of stripes/PV
DISKS="/dev/sde1 /dev/sde3"


# LV creation. Size given in Mbytes. To specify size in Logical
Extents use '-l'

lvcreate -L ${SIZE}M -n $LV -i $STRIPES $VG $DISKS
   Logical volume "testlv" created.


# Show new LV (note volume group is formed by three physical volumes
but only two of them
# have been used for the logical volume)
```

```
pvs | egrep "PFree|$VG"
  PV         VG     Fmt  Attr PSize    PFree
  /dev/sde1  testvg lvm2 a--  1020.00m  764.00m
  /dev/sde2  testvg lvm2 a--  1020.00m 1020.00m
  /dev/sde3  testvg lvm2 a--  1020.00m  764.00m

lvdisplay -m /dev/$VG/$LV
  --- Logical volume ---
  LV Path                /dev/testvg/testlv
  LV Name                testlv
  VG Name                testvg
  LV UUID                Imu7dH-vBai-Nrxu-q2LZ-HKaH-ELja-xAS33r
  LV Write Access        read/write
  LV Creation host, time myserver.localdomain, 2016-02-23 16:34:19
+0100
  LV Status              available
  # open                 0
  LV Size                512.00 MiB
  Current LE             128
  Segments               1
  Allocation             inherit
  Read ahead sectors     auto
  - currently set to     512
  Block device           253:8

  --- Segments ---
  Logical extents 0 to 127:
    Type                striped
    Stripes             2
    Stripe size         64.00 KiB
    Stripe 0:
      Physical volume   /dev/sde1       <---
      Physical extents  0 to 63
    Stripe 1:
      Physical volume   /dev/sde3       <---
      Physical extents  0 to 63
```

```
# Filesystem creation

mkfs -V -t $FSTYPE /dev/$VG/$LV

mkdir -p $MNTPT

mount /dev/$VG/$LV  $MNTPT
chown $OWNER $MNTPT



# Check

df -h $MNTPT
ls -ld $MNTPT



# Add output of following command to /etc/fstab
echo "/dev/$VG/$LV        $MNTPT               $FSTYPE
defaults         1 2"




# Mirrored
# ------------------------------------------------------------------------
-----------------------

# Every day it is less common to build mirrored logical volumes
because of the use of HW
# raids on local disks for OS, and SAN LUNs for data disks so we
usually build concat
# logical volumes on already mirrored physical volumes. Anyway here
is how to build a
# mirrored logical volume

MNTPT=/testmntpt
OWNER=testusr.testgrp
VG=testvg
```

```
LV=testlv
SIZE=512                        # Final size in MBytes
FSTYPE=ext3                     # ext4 can be created from RHEL 5 on
MIRRORS=1                       # Number of mirror copies, in this case
a 2-way mirror.
DISKS="/dev/sde1 /dev/sde2"


# This is a simplified procedure for creating a mirrored logical
volume as many options are
# available for this type of volumes.

# For instance, we could consider using '--mirrorlog' option that
provides the ability of
# specifying the type of log to be used. If this options is not used,
it takes "disk" as
# default value that is persistent and it will require a small amount
of storage space,
# usually on a separate device from the data being mirrored (as we
took only two disks for
# the mirror, the log is created in the mirrored volume itself; if we
wanted the log to be
# on a separate disk we should have set "DISKS" variable like this:
# DISKS="/dev/sde1 /dev/sde2"; consider using a small disk for log).
#
# The segment type for the new implementation of mirroring is
"raid1". For the earlier
# implementation, the segment type is "mirror". On the new
implementation, the default is
# "raid1". To use the legacy "mirror" segment type use "--type
mirror" option.


# LV creation. Size given in Mbytes. To specify size in Logical
Extents use '-l'

lvcreate -L ${SIZE}M -n $LV -m $MIRRORS $VG $DISKS
   Logical volume "testlv" created.
```

```
# Show LV

# Old implementation

lvdisplay -m /dev/$VG/$LV
  --- Logical volume ---
  LV Path                /dev/testvg/testlv
  LV Name                testlv
  VG Name                testvg
  LV UUID                FgqFKQ-kXEW-a9VF-PCX8-eqgL-lvi2-BBx3lb
  LV Write Access        read/write
  LV Creation host, time myserver, 2016-02-23 17:20:12 +0100
  LV Status              available
  # open                 0
  LV Size                512.00 MiB
  Current LE             128
  Mirrored volumes       2
  Segments               1
  Allocation             inherit
  Read ahead sectors     auto
  - currently set to     256
  Block device           253:11

  --- Segments ---
  Logical extent 0 to 127:
    Type                mirror
    Mirrors             2
    Mirror size         128
    Mirror log volume   testlv_mlog
    Mirror region size  512.00 KiB
    Mirror original:
      Logical volume    testlv_mimage_0
      Logical extents   0 to 127
    Mirror destinations:
      Logical volume    testlv_mimage_1
      Logical extents   0 to 127
```

```
pvs | egrep "PFree|$VG"
   PV         VG     Fmt  Attr PSize  PFree
   /dev/sde1  testvg lvm2 a--   1.01g 520.00m
   /dev/sde2  testvg lvm2 a--   1.01g 516.00m
   /dev/sde3  testvg lvm2 a--   1.01g   1.01g

lvs
   LV       VG     Attr      LSize   Pool Origin Data%  Move
Log         Cpy%Sync Convert
   testlv   testvg mwi-a-m-- 512.00m
testlv_mlog   100.00



# New implementation

lvdisplay -m /dev/$VG/$LV
   --- Logical volume ---
   LV Path                /dev/testvg/testlv
   LV Name                testlv
   VG Name                testvg
   LV UUID                kLpej7-9Kpv-re5p-9rU2-vWbx-m4BE-GpTKOh
   LV Write Access        read/write
   LV Creation host, time myserver.localdomain, 2016-02-23 17:20:10
+0100
   LV Status              available
   # open                 0
   LV Size                512.00 MiB
   Current LE             128
   Mirrored volumes       2
   Segments               1
   Allocation             inherit
   Read ahead sectors     auto
   - currently set to     8192
   Block device           253:12

   --- Segments ---
```

```
   Logical extents 0 to 127:
     Type                raid1
     Monitoring          monitored
     Raid Data LV 0
       Logical volume    testlv_rimage_0
       Logical extents   0 to 127
     Raid Data LV 1
       Logical volume    testlv_rimage_1
       Logical extents   0 to 127
     Raid Metadata LV 0  testlv_rmeta_0
     Raid Metadata LV 1  testlv_rmeta_1

pvs | egrep "PFree|$VG"
   PV         VG     Fmt  Attr PSize    PFree
   /dev/sde1  testvg lvm2 a--  1020.00m  504.00m
   /dev/sde2  testvg lvm2 a--  1020.00m  504.00m
   /dev/sde3  testvg lvm2 a--  1020.00m 1020.00m

lvs
   LV       VG     Attr       LSize   Pool Origin Data%  Meta%  Move
Log Cpy%Sync Convert
   [...]
   testlv   testvg rwi-a-r---
512.00m                                    100.00




# Filesystem creation

mkfs -V -t $FSTYPE /dev/$VG/$LV

mkdir -p $MNTPT

mount /dev/$VG/$LV  $MNTPT
chown $OWNER $MNTPT
```

```
# Check

df -h $MNTPT
ls -ld $MNTPT


# Add output of following command to /etc/fstab
echo "/dev/$VG/$LV        $MNTPT               $FSTYPE
defaults         1 2"
```

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