# RHEL: Extending the maximum inode count on a ext2/ext3/ext4 filesystem

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```
# Tested on RHEL 6 & 7


# An inode is a data structure that contains information about a file
or directory. Inodes
# rarely get used up when the file system has available space.
Nevertheless, this may
# happen when there is a large amount of small files or empty files
because each file or
# directory will use an inode.

# Once the filesystem created it is not possible to modify the number
of inodes so one
# should carefully decide the correct value for this parameter.

# In addition, we should take into account that the value of bytes
per inode shouldn't be
# smaller than the blocksize of the filesystem, otherwise there will
be more inodes on the
# filesystem than those that will be ever used.

# Inode number may be set by specifying the total number of inodes
during filesystem
# creation, "-N", or by indicating a bytes/inode ratio, "-i".


# For a small logical volume like following one:
```

**lvs /dev/rootvg/lv_test**

```
   LV      VG     Attr       LSize
   lv_test rootvg -wi-a----- 512.00m
```

```
# I'll create a ext3 filesystem using different bytes/inode ratio.
Pay attention to the
# space "lost" on the filesystem for inode purposes:
```

**mkfs.ext3 /dev/rootvg/lv_test**

```
   mke2fs 1.41.12 (17-May-2010)
   Filesystem label=
   OS type: Linux
   Block size=4096 (log=2)
   Fragment size=4096 (log=2)
   Stride=0 blocks, Stripe width=0 blocks
   32768 inodes, 131072 blocks
   6553 blocks (5.00%) reserved for the super user
   First data block=0
   Maximum filesystem blocks=134217728
   4 block groups
   32768 blocks per group, 32768 fragments per group
   8192 inodes per group
   Superblock backups stored on blocks:
           32768, 98304
```

**df -h /test**

```
   Filesystem            Size  Used Avail Use% Mounted on
   /dev/mapper/rootvg-lv_test
                         504M   17M  462M   4% /test
```

**mkfs.ext3 -i 4096 /dev/rootvg/lv_test**

```
   mke2fs 1.41.12 (17-May-2010)
   Filesystem label=
   OS type: Linux
   Block size=4096 (log=2)
```

```
   Fragment size=4096 (log=2)
   Stride=0 blocks, Stripe width=0 blocks
   131072 inodes, 131072 blocks
   6553 blocks (5.00%) reserved for the super user
   First data block=0
   Maximum filesystem blocks=134217728
   4 block groups
   32768 blocks per group, 32768 fragments per group
   32768 inodes per group
   Superblock backups stored on blocks:
           32768, 98304

df -h /test
   Filesystem            Size  Used Avail Use% Mounted on
   /dev/mapper/rootvg-lv_test
                         480M   17M  438M   4% /test



mkfs.ext3 -i 1024 /dev/rootvg/lv_test
   mke2fs 1.41.12 (17-May-2010)
   Filesystem label=
   OS type: Linux
   Block size=4096 (log=2)
   Fragment size=4096 (log=2)
   Stride=0 blocks, Stripe width=0 blocks
   524288 inodes, 131072 blocks
   6553 blocks (5.00%) reserved for the super user
   First data block=0
   Maximum filesystem blocks=135272448
   16 block groups
   8592 blocks per group, 8592 fragments per group
   32768 inodes per group
   Superblock backups stored on blocks:
           8592, 25776, 42960, 60144, 77328

df -h /test
   Filesystem            Size  Used Avail Use% Mounted on
```

```
/dev/mapper/rootvg-lv_test
                      384M   19M  340M   6% /test
```