

RHCE 排错强化训练!

我的博客: <http://wqmsl.blog.51cto.com/>

整理人: **wqmsl**

系统安装: 分两种情况

(1)、没有 **lvm**, 手动设置分区, 以这个为主。下图是这种方式的 **/etc/fstab** 文件

```

LABEL=/                               /                               ext3      defaults    1 1
LABEL=/home                           /home                           ext3      defaults    1 2
LABEL=/boot                           /boot                           ext3      defaults    1 2
tmpfs                                  /dev/shm                        tmpfs     defaults    0 0
devpts                                 /dev/pts                        devpts    gid=5,mode=620 0 0
sysfs                                  /sys                            sysfs     defaults    0 0
proc                                   /proc                           proc      defaults    0 0
LABEL=SWAP-sda5                        swap                             swap      defaults    0 0
```

(2)、有 **lvm**, 系统默认方式安装, 下图是默认方式安装的 **/etc/fstab** 文件, 不同情况在具体问题中有说明

```

[root@r39 ~]# cat /etc/fstab
/dev/VolGroup00/LogVol00 /                               ext3      defaults    1 1
LABEL=/boot            /boot                           ext3      defaults    1 2
tmpfs                   /dev/shm                        tmpfs     defaults    0 0
devpts                  /dev/pts                        devpts    gid=5,mode=620 0 0
sysfs                   /sys                            sysfs     defaults    0 0
proc                    /proc                           proc      defaults    0 0
/dev/VolGroup00/LogVol01 swap                             swap      defaults    0 0
[root@r39 ~]# _
```

几种故障, 包括但不限于:

- 一、grub.conf 文件丢失
- 二、grub 目录丢失
- 三、boot 目录丢失
- 四、/etc/fstab 文件丢失
- 五、/etc/inittab 文件丢失
- 六、mount 文件被修改
- 七、综合实验

- 一、grub.conf 文件丢失

启动时提示

```

GNU GRUB  version 0.97  (638K lower / 268832K upper memory)

[ Minimal BASH-like line editing is supported.  For the first word, TAB
  lists possible command completions.  Anywhere else TAB lists the possible
  completions of a device/filename.]
grub> _
```

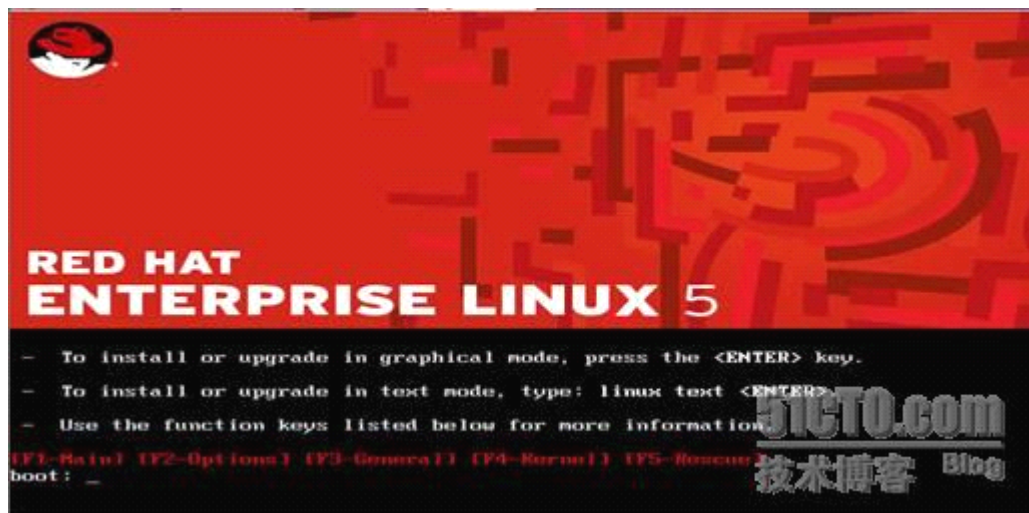
- (1) 没有 LVM 情况

```
default=0
timeout=2
title REDHAT
root (hd0,0)
kernel /vmlinuz-2.6.18-53.el5 ro root=LABEL=/ rhgb quiet
initrd /initrd-2.6.18-53.el5.img
```

(2) 有 LVM 的情况 注意上下两种情况区别在 root=“ ”这一句。具体内容参照/etc/fstab 文件中的内容

```
default=0
timeout=2
title REDHAT
root (hd0,0)
kernel /vmlinuz-2.6.18-53.el5 ro root=/dev/VolGroup00/LogVol00 rhgb quiet
initrd /initrd-2.6.18-53.el5.img
```

重启利用光盘进入 rescue 模式





二、,grub 目录丢失

正常 grub 目录下的文件

```
(root@r39 grub) # ls
device.map      grub.conf      minix_stage1_5  stage2
e2fs_stage1_5   iso9660_stage1_5 reiserfs_stage1_5 ufs2_stage1_5
fat_stage1_5     jfs_stage1_5    splash.xpm.gz   vstafs_stage1_5
ffs_stage1_5     menu.lst        stage1          xfs_stage1_5
```

重启进入系统提示:

```
GNU GRUB version 0.97 (638K lower / 268032K upper memory)

[ Minimal BASH-like line editing is supported. For the first word, TAB
  lists possible command completions. Anywhere else TAB lists the possible
  completions of a device/filename.]

grub> _
```

在提示符中按照 grub 文件丢失的处理方式进入系统。提示:

```
grub> kernel /vmlinuz-2.6.18-53.el5 ro root=LABEL=/ rhgb quiet
[Linux-bzImage, setup=0x1e00, size=0x1b3654]

grub> initrd /initrd-2.6.18-53.el5.img r
Error 11: Unrecognized device string

grub> initrd /initrd-2.6.18-53.el5.img
[Linux-initrd @ 0xfbe9000, 0x2f62d3 bytes]

grub> boot
Memory for crash kernel (0x0 to 0x0) not within permissible range
poweroff-k8: BIOS error - no PSB or ACPI _PSS objects
Red Hat nash version 5.1.19.6 starting
sda: assuming drive cache: write through
sda: assuming drive cache: write through
Reading all physical volumes. This may take a while...
Found volume group "VolGroup00" using metadata type lvm2
2 logical volume(s) in volume group "VolGroup00" now active
mount: could not find filesystem '/dev/root'
setuproot: moving /dev failed: No such file or directory
setuproot: error mounting /proc: No such file or directory
setuproot: error mounting /sys: No such file or directory
switchroot: mount failed: No such file or directory
Kernel panic - not syncing: Attempted to kill init!
```

重启进入 rescue 模式, 并 chroot 进入真实环境模式

```
Your system is mounted under the /mnt/sysimage directory.
When finished please exit from the shell and your system will reboot.

sh-3.1# chroot /mnt/sysimage/
sh-3.1# _
```

进入/boot/grub 目录, 发现目录内容是空的, 需要在 chroot 环境下重新安装 grub: grub-install /dev/sda

```
sh-3.1# grub-install /dev/sda
Probing devices to guess BIOS drives. This may take a long time.
Installation finished. No error reported.
This is the contents of the device map /boot/grub/device.map
Check if this is correct or not. If any of the lines is incorrect,
fix it and re-run the script 'grub-install'.
```



```
sh-3.1# cd /boot/grub/
sh-3.1# ls
device.map      iso9660_stage1_5  stage1          xfs_stage1_5
e2fs_stage1_5   jfs_stage1_5     stage2
fat_stage1_5     minix_stage1_5   ufs2_stage1_5
ffs_stage1_5     reiserfs_stage1_5 vstafs_stage1_5
```

参照 grub.conf 文件丢失的方式，重新写入 grub.conf 文件

(1) 没有 LVM 情况

```
default=0
timeout=2
title REDHAT
root (hd0,0)
kernel /vmlinuz-2.6.18-53.el5 ro root=LABEL=/ rhgb quiet
initrd /initrd-2.6.18-53.el5.img
```

(2) 有 LVM 的情况 注意上下两种情况区别在 root= “ ” 这一句。具体内容参照/etc/fstab 文件中的内容

```
default=0
timeout=2
title REDHAT
root (hd0,0)
kernel /vmlinuz-2.6.18-53.el5 ro root=/dev/VolGroup00/LogVol00 rhgb quiet
initrd /initrd-2.6.18-53.el5.img
```

重启正常系统

三、boot 目录丢失

重新进入系统，提示

```
GNU GRUB version 0.97 (638K lower / 268832K upper memory)

[ Minimal BASH-like line editing is supported. For the first word, TAB
  lists possible command completions. Anywhere else TAB lists the possible
  completions of a device/filename.]

grub> root (hd0,0)
Filesystem type is ext2fs, partition type 0x83

grub> kernel /vml
Error 15: File not found

grub> kernel /v
Error 15: File not found

grub> kernel /v
Error 15: File not found

grub> kernel /v_
```

发现找不到 vmlinuz 等文件

进入 rescue 模式，发现/boot 下面没有任何文件

```
Your system is mounted under the /mnt/sysimage directory.
When finished please exit from the shell and your system will reboot.

sh-3.1# cd /mnt/sysimage/boot
sh-3.1# ls
sh-3.1#
```

需要重新安装 kernel 包，然后安装 grub-install，最后编辑 grub.conf 文件

这里通过启用网络，从 ftp 服务器上下载 rpm 包，然后安装到系统中，具体步骤：

- (1) chroot /mnt/sysimage
- (2) service network restart
- (3) lftp 192.168.0.254; 通过 ftp 登录系统,
- (4)

```
lftp 192.168.0.254:/pub/Server> get kernel-2.6.18-53.el5.i686.rpm
```

- (5) 退出 chroot 模式

```
sh-3.1# exit
exit
sh-3.1#
```

- (6) 安装 rpm 包

```
rpm -ivh --force --root /mnt/sysimage /mnt/sysimage/kernel-2.6.18-53.el5.i686.rpm
```

```
<image/ /mnt/sysimage/kernel-2.6.18-53.el5.i686.rpm
warning: /mnt/sysimage/kernel-2.6.18-53.el5.i686.rpm: Header V3 RSA signature, NO
OKEY, key ID 37017186
Preparing...
1:kernel
sh-3.1#
```

- (7) 输入 exit 重启系统, 正常进入系统

四、/etc/fstab 文件丢失

删除/etc/fstab 文件, 关机再开机, 如果直接重启, 会发现没有/etc/fstab 文件也可以进入系统

- (1) 没有 lvm 情况, 开机提示: 注意两个红色的 FAILED

```
Enabling /etc/fstab swaps: swapon: cannot open /etc/fstab:
No such file or directory
[FAILED]
/etc/rc.d/rc.sysinit: line 914: /var/log/dmccg: Read-only file system
touch: cannot touch '/var/run/getkey_done': Read-only file system
INIT: Entering runlevel: 3
Bringing up loopback interface: [ OK ]
Bringing up interface eth0: [ OK ]
touch: cannot touch '/var/lock/subsys/network': Read-only file system
Starting auditd: [FAILED]
touch: cannot touch '/var/lock/subsys/restorecond': Read-only file system
```

↵

```
sh-3.1# fdisk /dev/sda

The number of cylinders for this disk is set to 1044.
There is nothing wrong with that, but this is larger than 1024,
and could in certain setups cause problems with:
 1) software that runs at boot time (e.g., old versions of LILO)
 2) booting and partitioning software from other OSs
    (e.g., DOS FDISK, OS/2 FDISK)

Command (m for help): p

Disk /dev/sda: 8589 MB, 8589934592 bytes
255 heads, 63 sectors/track, 1044 cylinders
Units = cylinders of 16865 * 512 = 8625280 bytes

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1  *           1           13      104391   83  Linux
/dev/sda2             14          650     5116702+   83  Linux
/dev/sda3           651          905     2048207+   83  Linux
/dev/sda4           906         1044     1116517+    5  Extended
/dev/sda5           906          978      522081   82  Linux swap / Solaris

Command (m for help):
```

通过 e2label 查找 / 分区↵

```
sh-3.1# e2label /dev/sda2
```

mkdir /test

```

sh-3.1# mount /dev/sda2 /test
sh-3.1# cd /test
sh-3.1# ls
bin                net
boot              opt
dev               proc
etc               root
home              sbin
initscripts-8.45.17.EL-1.i386.rpm selinux
kernel-2.6.18-53.el5.i686.rpm  srv
lib               sys
lost+found        tmp
media             usr
misc              util-linux-2.13-8.45.el5.i686.rpm
mnt               var
sh-3.1#

```

#vi /test/etc/fstab

```

/dev/sda1 /boot      ext3      defaults 0 0
/dev/sda2 /              ext3      defaults 0 0
/dev/sda3 /home      ext3      defaults 0 0
devpts    /dev/pts    devpts    gid=5,mode=620 0 0
/dev/sda5 swap        swap      defaults 0 0

```

(2) 有 lvm 的情况

进入系统后, lvm vgchange -ay

```

sh-3.1# lvm vgchange -ay
  2 logical volume(s) in volume group "VolGroup00" now active
sh-3.1#

sh-3.1# mkdir /test
sh-3.1# mount /dev/VolGroup00/LogVol00 /test
sh-3.1# cd /test
sh-3.1# ls
bin    etc    lib    misc    opt    root    srv    tftpboot    var
boot  home  lost+found  mnt    proc   sbin    sys    tmp
dev   iso   media  net     rhome  selinux test   usr

```

重新编辑 etc/fstab 文件, 本实验中, 该文件位于/test/etc/fstab

```

/dev/VolGroup00/LogVol00 /              ext3      defaults 1 1
LABEL=/boot          /boot         ext3      defaults 1 2
tmpfs                 /dev/shm      tmpfs     defaults 0 0
devpts                /dev/pts      devpts    gid=5,mode=620 0 0
sysfs                 /sys          sysfs     defaults 0 0
proc                  /proc         proc      defaults 0 0
/dev/VolGroup00/LogVol01 swap            swap      defaults 0 0

```

重启正常进入系统

五、/etc/inittab 文件丢失

重启系统提示:

```
Booting 'REDHAT'
root (hd0,0)
Filesystem type is ext2fs, partition type 0x83
kernel /vmlinuz-2.6.18-53.el5 ro root=LABEL=/ rhgb quiet
[Linux-bzImage, setup=0x1e00, size=0x1b3654]
initrd /initrd-2.6.18-53.el5.img
[Linux-initrd @ 0xfc90000, 0x24f55d bytes]

Memory for crash kernel (0x0 to 0x0) not within permissible range
powernow-k8: BIOS error - no PSB or ACPI _PSS objects
Red Hat nash version 5.1.19.6 starting
sda: assuming drive cache: write through
sda: assuming drive cache: write through
INIT: No inittab file found

Enter runlevel: _
```

进入 rescue 模式

重新安装 initscripts-8.45.17.EL-1.i386.rpm 包 参照修复/boot/grub 目录方式从 ftp 服务器
上下载 rpm 包，然后安装。

六、mount 文件被修改

重启提示：

```
rm: cannot remove '/var/run/sdp': Read-only file system
rm: cannot remove '/var/run/setroubleshoot/setroubleshoot_server': Read-only file system
rm: cannot remove '/var/run/setroubleshootd.pid': Read-only file system
rm: cannot remove '/var/run/utmp': Read-only file system
/etc/rc.d/rc.sysinit: line 844: /var/run/utmp: Read-only file system
touch: cannot touch '/var/log/utmp': Read-only file system
chgrp: changing group of '/var/run/utmp': Read-only file system
chgrp: changing group of '/var/log/utmp': Read-only file system
chmod: changing permissions of '/var/run/utmp': Read-only file system
chmod: changing permissions of '/var/log/utmp': Read-only file system
rm: cannot remove directory '/tmp/.ICE-unix': Read-only file system
rm: cannot remove directory '/tmp/.ICE-unix': Read-only file system
chown: changing ownership of '/tmp/.ICE-unix': Read-only file system
rm: cannot remove directory '/tmp/.ICE-unix': Read-only file system
chown: changing ownership of '/tmp/.ICE-unix': Read-only file system
Enabling /etc/fstab swaps: [ OK ]
/etc/rc.d/rc.sysinit: line 914: /var/log/dmesg: Read-only file system
touch: cannot touch '/var/run/getkey_done': Read-only file system
INIT: Entering runlevel: 3
Bringing up loopback interface:
Bringing up interface eth0:
touch: cannot touch '/var/lock/subsys/network': Read-only file system
Starting auditd:
touch: cannot touch '/var/lock/subsys/restorecond': Read-only file system
Starting system logger: _
```

进入 rescue 模式

rpm -Vf --root /mnt/sysimage /bin/mount 发现有问题

rpm -qf --root /mnt/sysimage /bin/mount 查找该文件属于哪个 RPM 安装包


```
sh-3.1# chroot /mnt/sysimage
sh-3.1# _
```

启动网络，进入 chroot 模式，↵

```
sh-3.1# service network restart
Shutting down loopback interface: [ OK ]
Bringing up loopback interface: [ OK ]
Bringing up interface eth0: [ OK ]
sh-3.1#
```

利用 lftp 下载 mount 文件对应的 rpm 包↵

```
sh-3.1# lftp 192.168.0.254
lftp 192.168.0.254:> ls
-rw-r--r-- 1 0 0 770 Mar 29 12:01 ks.cfg
drwxr-xr-x 8 0 0 4096 Mar 29 13:10 pub
lftp 192.168.0.254:> get pub/Server/util-linux-2.13-0.45.e15.i386.rpm
1931150 bytes transferred
lftp 192.168.0.254:> _
```

退回到模式↵

```
sh-3.1# exit
exit
sh-3.1# _
```

安装 mount 对应的 rpm 包↵

rpm -ivh --force --root /mnt/sysimage /mnt/sysimage/util-linux-2.13-0.45.e15.i386.rpm↵

```
sh-3.1# rpm -ivh --force --root /mnt/sysimage/ /mnt/sysimage/util-linux-2.13-0.45.e15.i386.rpm
warning: /mnt/sysimage/util-linux-2.13-0.45.e15.i386.rpm: Header V3 DSA signature: NOKEY, key ID 37017186
Preparing...
1:util-linux
```

我的博客: <http://wqmsl.blog.51cto.com/>

QQ:459176770