



**Intel® Modular Server System MFSYS25  
Intel® Modular Server System MFSYS35**

**Virtual Disk Copy BKM**

**SUSE\* Linux Enterprise Server 11**

Revision 1.0

October, 2009

Enterprise Platforms and Services Division - Marketing

## ***Revision History***

| Date          | Revision Number | Modifications    |
|---------------|-----------------|------------------|
| October, 2009 | 1.0             | Initial release. |
|               |                 |                  |
|               |                 |                  |

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## ***Table of Contents***

|  |          |
|--|----------|
| <b>1. Introduction .....</b>               | <b>5</b> |
| 1.1 Supported Intel® Server Products ..... | 5        |
| <b>2. Repair Instructions.....</b>         | <b>6</b> |

## ***List of Figures***

|  |    |
|--|----|
| Figure 1. Select Virtual Disk to Copy .....        | 6  |
| Figure 2. Boot Fail Indication .....               | 7  |
| Figure 3. Boot Fail to Command Prompt .....        | 7  |
| Figure 4. Check the Disk ID .....                  | 8  |
| Figure 5. Create a Temporary Mount Point .....     | 8  |
| Figure 6. Update fstab with New Disk ID .....      | 9  |
| Figure 7. Updated fstab with New Disk ID .....     | 9  |
| Figure 8. Update GRUB Menu .....                   | 10 |
| Figure 9. Updated GRUB Menu with new Disk ID ..... | 10 |
| Figure 10. Edit “/boot/grub/device.map” .....      | 11 |
| Figure 11. Updated GRUB Device Map .....           | 11 |

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# 1. Introduction

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When a virtual disk containing an installation of SUSE\* Linux Enterprise Server 11 (SLES11) is copied, the data on the disk is replicated exactly to a new virtual disk. While the data on the virtual disks does not change, information about the virtual disk itself will be different on the new disk. For example, the disk ID (the SAS disk WWN) is different between the source virtual disk and the copy. This change in disk information will cause problems booting SLES11 since SLES11 uses disk ID information to mount partitions.

This BKM contains instructions for updating the disk ID information on the copied disk so SLES11 can be booted normally after copying.

These instructions work for a single SCM installation or a dual SCM installation with storage multipathing configured.

## 1.1 Supported Intel® Server Products

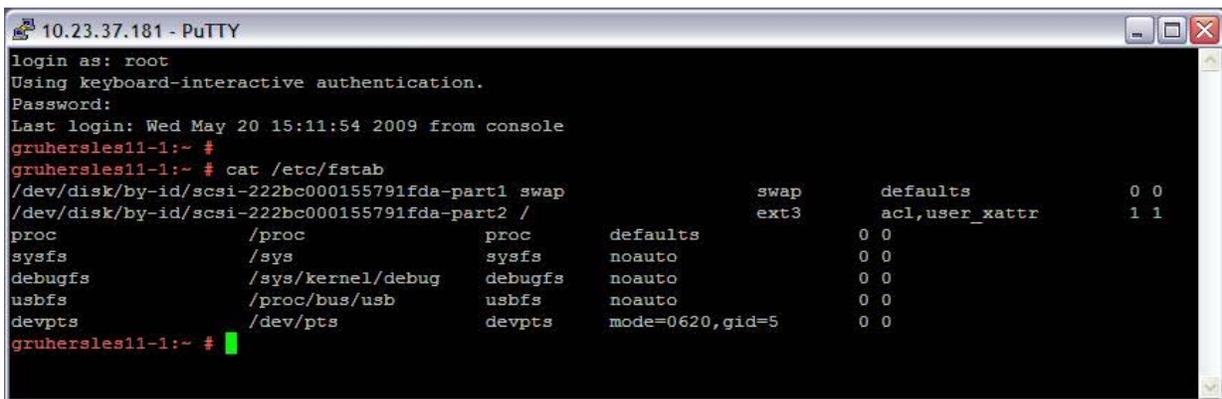
The following Intel® Server Products are supported with the Intel® Modular Server System Unified Firmware Update V4.0 or later installed:

- Intel® Modular Server System MFSYS25
- Intel® Modular Server System MFSYS35
- Intel® Compute Module MFS5000SI
- Intel® Compute Module MFS5520VI

## 2. Repair Instructions

These instructions will show you how to check disk ID information on your source disk, then check disk ID information on your copied disk and update the SLES11 installation on the copied disk to use the new disk ID information.

1. You will need to establish the disk ID of the virtual disk containing the original OS installation. This should be done on the source OS virtual disk, not on the copy. This can be done before or after making the copy.
  - a. Boot one of the compute modules from the disk and log into the SLES11 operating system.
  - b. Run the command “cat /etc/fstab” and make a copy of the information displayed. You will refer back to this information in later steps. The screenshot below shows a sample fstab contents.



```
10.23.37.181 - PuTTY
login as: root
Using keyboard-interactive authentication.
Password:
Last login: Wed May 20 15:11:54 2009 from console
gruherles11-1:~ #
gruherles11-1:~ # cat /etc/fstab
/dev/disk/by-id/scsi-222bc000155791fda-part1 swap                swap                defaults            0 0
/dev/disk/by-id/scsi-222bc000155791fda-part2 /                    ext3                acl,user_xattr      1 1
proc                /proc               proc                defaults            0 0
sysfs               /sys                sysfs               noauto              0 0
debugfs             /sys/kernel/debug  debugfs            noauto              0 0
usbfs               /proc/bus/usb       usbfs               noauto              0 0
devpts              /dev/pts            devpts             mode=0620,gid=5    0 0
gruherles11-1:~ #
```

Figure 1. Select Virtual Disk to Copy

2. If you have not yet made a copy of the OS virtual disk, power down the server and make a copy now. If you have already made a copy, go on to the next step.
3. Attach your copied virtual disk to a compute module as disk 0 and power on the module. SLES 11 should begin to boot but fail as shown in the screenshot below.

```

Remote KVM Session to Server 3 - 6 fps
Video Device Keyboard Mouse Help
input,hidraw2: USB HID v1.10 Keyboard [American Megatrends Inc. All in One Composite Device] on usb-0000:00:1d.2-2
input: American Megatrends Inc. All in One Composite Device as /dev/input/lp0000:00/0000:00:1d.2/usb4/4-2/4-2:1.1/input/input3
input,hidraw3: USB HID v1.10 Mouse [American Megatrends Inc. All in One Composite Device] on usb-0000:00:1d.2-2
usbcore: registered new interface driver usbhid
usbhid: v2.6:USB HID core driver
Boot logging started on /dev/tty1(/dev/console) at Wed May 20 22:47:08 2009
device-mapper: multipath round-robin: version 1.0.0 loaded
emc: device handler registered
hp_su: device handler registered
rdac: device handler registered
Setup multipath devices: sd 0:0:0:0: alua: port group 00 state A supports touSna
sd 0:0:0:0: alua: port group 00 state A supports touSna
ok.
Trying manual resume from /dev/disk/by-id/scsi-222bc000155791fda-part1
resume device /dev/disk/by-id/scsi-222bc000155791fda-part1 not found (ignoring)
Trying manual resume from /dev/disk/by-id/scsi-222bc000155791fda-part1
resume device /dev/disk/by-id/scsi-222bc000155791fda-part1 not found (ignoring)
Waiting for device /dev/disk/by-id/scsi-222bc000155791fda-part2 to appear: .....Could not find /dev/disk/by-id/scsi-222bc000155791fda-part2.
Want me to fall back to /dev/disk/by-id/scsi-222bc000155791fda-part2? (Y/n)

```

Figure 2. Boot Fail Indication

4. Enter “y” to continue. This will also fail and you will end up at a command prompt, as shown below.

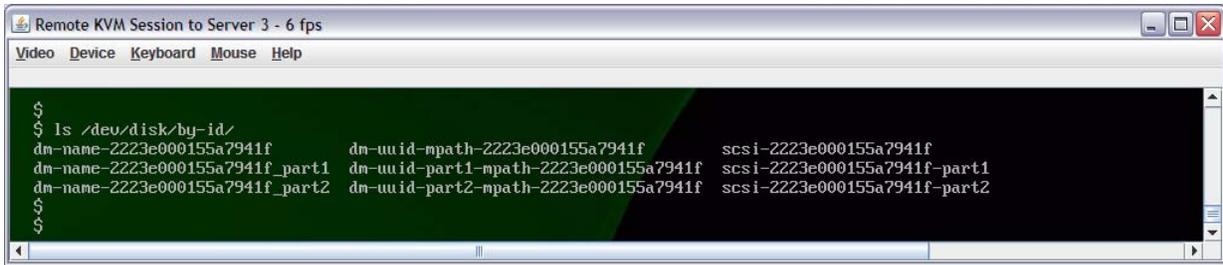
```

Remote KVM Session to Server 3 - 8 fps
Video Device Keyboard Mouse Help
input,hidraw3: USB HID v1.10 Mouse [American Megatrends Inc. All in One Composite Device] on usb-0000:00:1d.2-2
usbcore: registered new interface driver usbhid
usbhid: v2.6:USB HID core driver
Boot logging started on /dev/tty1(/dev/console) at Wed May 20 22:47:08 2009
device-mapper: multipath round-robin: version 1.0.0 loaded
emc: device handler registered
hp_su: device handler registered
rdac: device handler registered
Setup multipath devices: sd 0:0:0:0: alua: port group 00 state A supports touSna
sd 0:0:0:0: alua: port group 00 state A supports touSna
ok.
Trying manual resume from /dev/disk/by-id/scsi-222bc000155791fda-part1
resume device /dev/disk/by-id/scsi-222bc000155791fda-part1 not found (ignoring)
Trying manual resume from /dev/disk/by-id/scsi-222bc000155791fda-part1
resume device /dev/disk/by-id/scsi-222bc000155791fda-part1 not found (ignoring)
Waiting for device /dev/disk/by-id/scsi-222bc000155791fda-part2 to appear: .....Could not find /dev/disk/by-id/scsi-222bc000155791fda-part2.
Want me to fall back to /dev/disk/by-id/scsi-222bc000155791fda-part2? (Y/n)
y
Waiting for device /dev/disk/by-id/scsi-222bc000155791fda-part2 to appear: .....not found -- exiting to /bin/sh
$

```

Figure 3. Boot Fail to Command Prompt

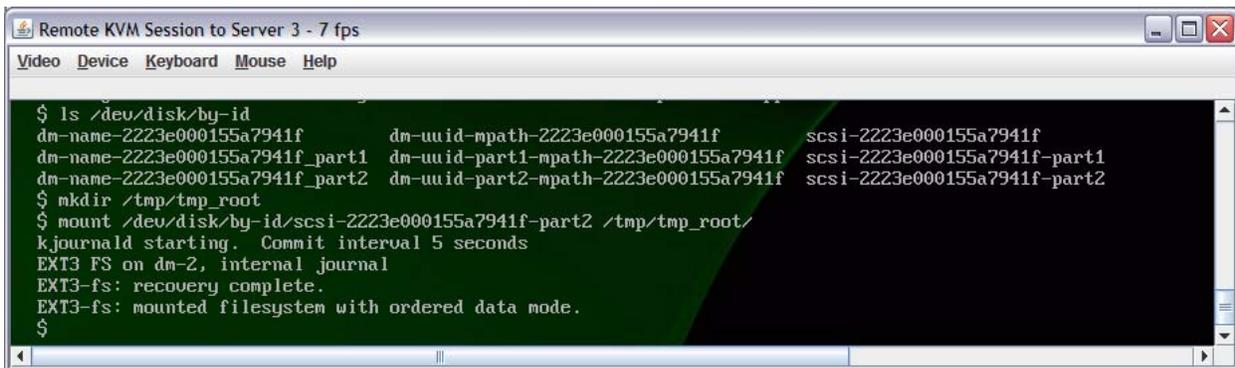
5. Check the disk ID for the new disk.
  - a. Run “ls /dev/disk/by-id” at the command prompt.
  - b. In the output you will see the disk ID as the items starting with “scsi-“. Depending on your system you may or may not see items starting with “dm“. If you do, these items can be ignored.
  - c. In this example the disk ID is scsi-2223e000155a7941f. You will want to write down this value to refer to later.



```
Remote KVM Session to Server 3 - 6 fps
Video Device Keyboard Mouse Help
$ ls /dev/disk/by-id/
dm-name-2223e000155a7941f      dm-uuid-mpath-2223e000155a7941f      scsi-2223e000155a7941f
dm-name-2223e000155a7941f_part1  dm-uuid-part1-mpath-2223e000155a7941f  scsi-2223e000155a7941f-part1
dm-name-2223e000155a7941f_part2  dm-uuid-part2-mpath-2223e000155a7941f  scsi-2223e000155a7941f-part2
$
```

Figure 4. Check the Disk ID

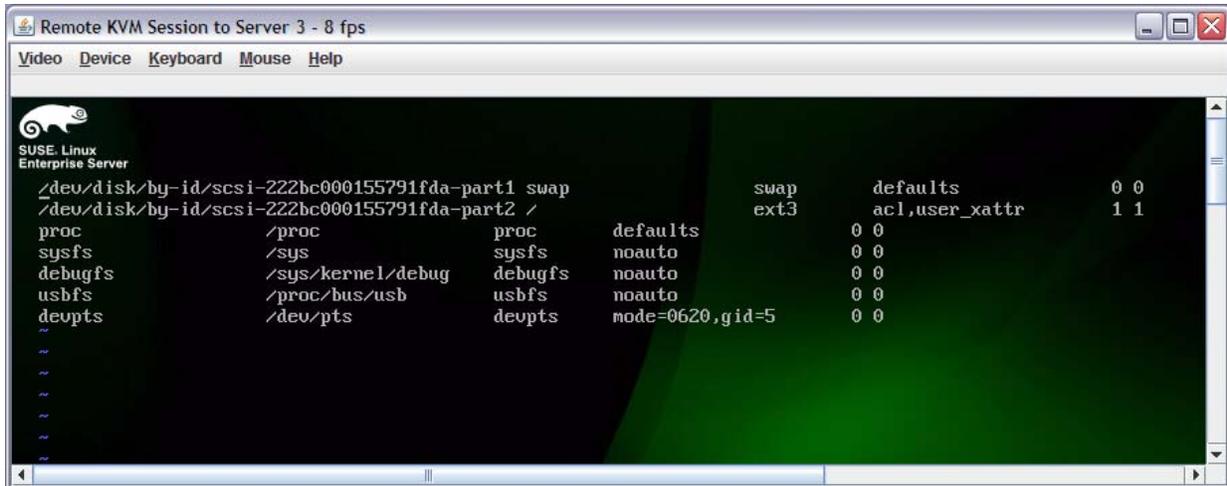
6. Next we will make a temporary mount point and mount the root partition from the new disk.
  - a. Make a temporary mount point “tmp\_root” in /tmp by running the command “mkdir /tmp/tmp\_root”.
  - b. Refer back to the fstab information from the original disk which you captured in step 1. Check the partition number for the root (/) partition. In this example it is partition 2 (“-part2”).
  - c. Mount the root partition to your temporary mount. For this example we do this by running the command “mount /dev/disk/by-id/scsi-2223e000155a7941f-part2”. On your system you will run the same command, but your disk ID string will be different (refer to step 5) and your partition number may be different.



```
Remote KVM Session to Server 3 - 7 fps
Video Device Keyboard Mouse Help
$ ls /dev/disk/by-id
dm-name-2223e000155a7941f      dm-uuid-mpath-2223e000155a7941f      scsi-2223e000155a7941f
dm-name-2223e000155a7941f_part1  dm-uuid-part1-mpath-2223e000155a7941f  scsi-2223e000155a7941f-part1
dm-name-2223e000155a7941f_part2  dm-uuid-part2-mpath-2223e000155a7941f  scsi-2223e000155a7941f-part2
$ mkdir /tmp/tmp_root
$ mount /dev/disk/by-id/scsi-2223e000155a7941f-part2 /tmp/tmp_root/
kjournald starting. Commit interval 5 seconds
EXT3 FS on dm-2, internal journal
EXT3-fs: recovery complete.
EXT3-fs: mounted filesystem with ordered data mode.
$
```

Figure 5. Create a Temporary Mount Point

7. Next we want to update fstab on the new system to use the new disk ID instead of the original disk ID. The shell you are in does not support a text editor so we will call one from the root partition we mounted in the previous step.
  - a. Run “/tmp/tmp\_root/bin/vim-normal /tmp/tmp\_root/etc/fstab”. It should appear similar to the screenshot below.



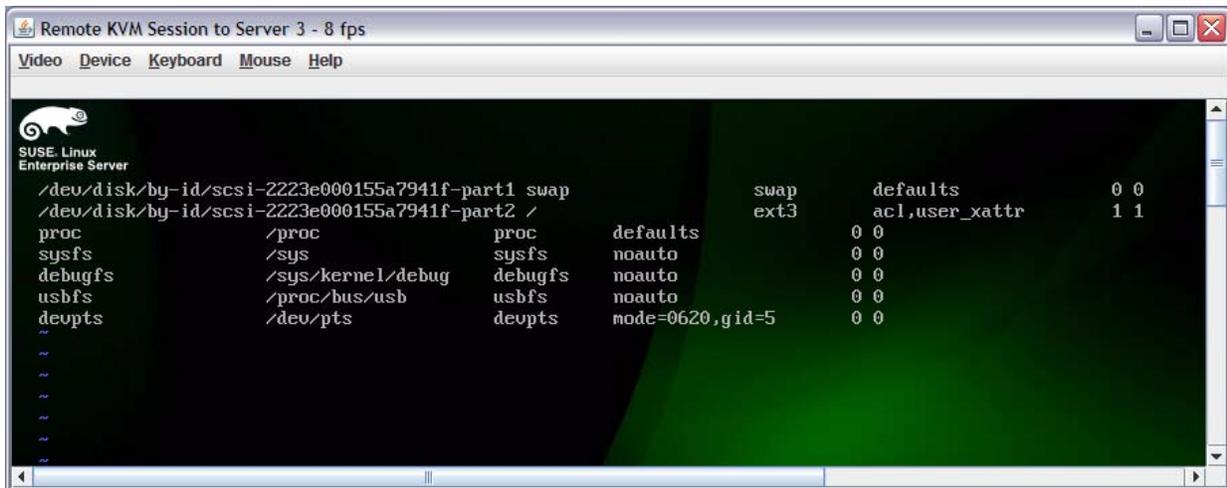
```

Remote KVM Session to Server 3 - 8 fps
Video Device Keyboard Mouse Help
SUSE Linux
Enterprise Server
/dev/disk/by-id/scsi-222bc000155791fda-part1 swap          swap          defaults      0 0
/dev/disk/by-id/scsi-222bc000155791fda-part2 /              ext3          acl,user_xattr 1 1
proc           /proc         proc          defaults      0 0
sysfs         /sys          sysfs         noauto        0 0
debugfs       /sys/kernel/debug debugfs       noauto        0 0
usbfs        /proc/bus/usb  usbfs        noauto        0 0
devpts       /dev/pts     devpts       mode=0620,gid=5 0 0
~
~
~
~
~

```

Figure 6. Update fstab with New Disk ID

- b. Note that the disk IDs are for the original disk and not the copied disk. Change them to match the new disk ID. After changes fstab should look like the screenshot below (your disk IDs will be different).



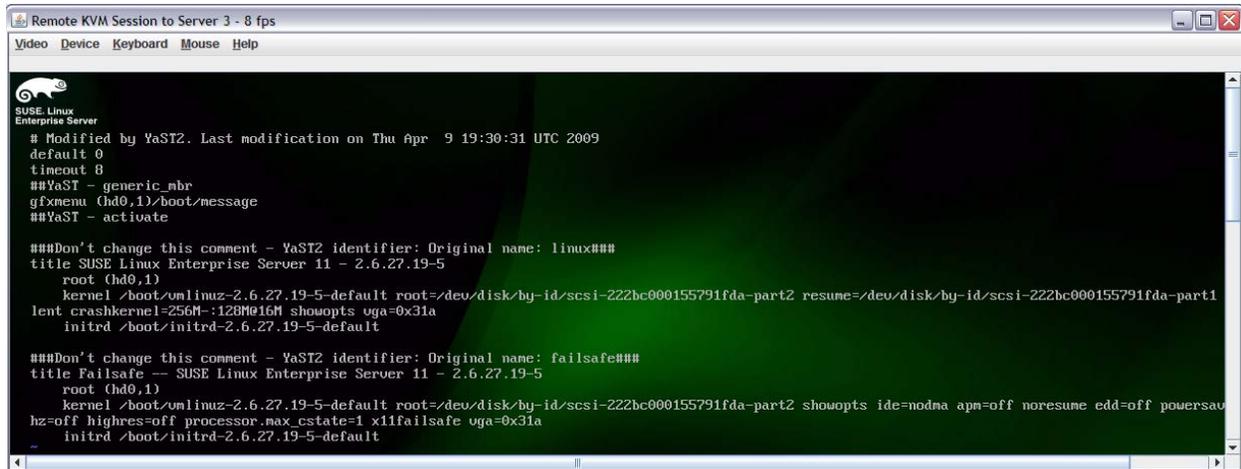
```

Remote KVM Session to Server 3 - 8 fps
Video Device Keyboard Mouse Help
SUSE Linux
Enterprise Server
/dev/disk/by-id/scsi-2223e000155a7941f-part1 swap          swap          defaults      0 0
/dev/disk/by-id/scsi-2223e000155a7941f-part2 /              ext3          acl,user_xattr 1 1
proc           /proc         proc          defaults      0 0
sysfs         /sys          sysfs         noauto        0 0
debugfs       /sys/kernel/debug debugfs       noauto        0 0
usbfs        /proc/bus/usb  usbfs        noauto        0 0
devpts       /dev/pts     devpts       mode=0620,gid=5 0 0
~
~
~
~
~

```

Figure 7. Updated fstab with New Disk ID

- c. Save and exit.
8. Next we want to update the GRUB menu on the new system to use the new disk ID instead of the original disk ID. The shell you are in does not support a text editor so we will call one from the root partition we mounted in the previous step.
    - a. Run “/tmp/tmp\_root/bin/vim-normal /tmp/tmp\_root/boot/grub/menu.lst”. It should appear similar to the screenshot below.



```

Remote KVM Session to Server 3 - 8 fps
Video Device Keyboard Mouse Help

SUSE Linux
Enterprise Server

# Modified by YaST2. Last modification on Thu Apr  9 19:30:31 UTC 2009
default 0
timeout 8
##YaST - generic_mbr
gfxmenu (hd0,1)/boot/message
##YaST - activate

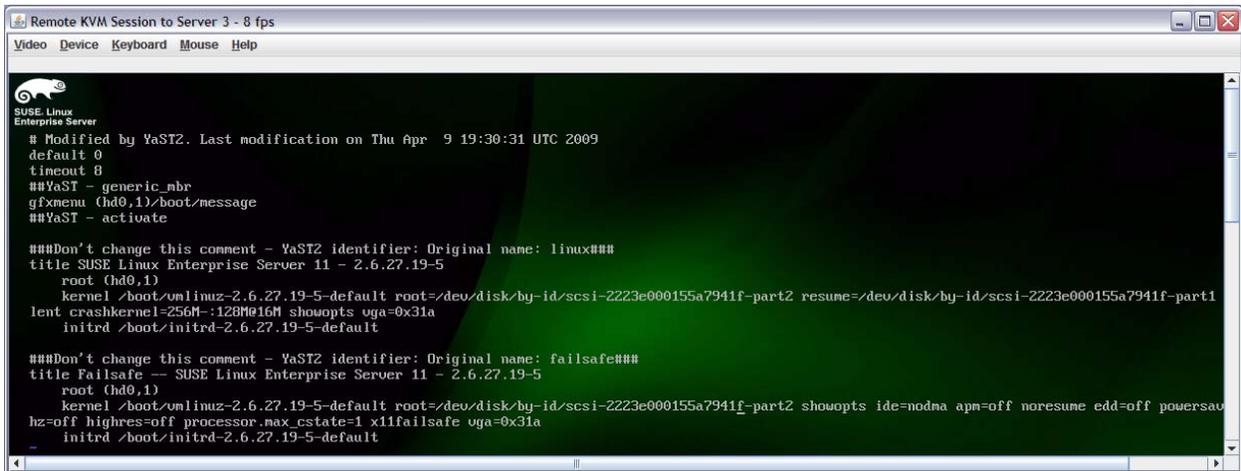
###Don't change this comment - YaST2 identifier: Original name: linux###
title SUSE Linux Enterprise Server 11 - 2.6.27.19-5
  root (hd0,1)
  kernel /boot/vmlinuz-2.6.27.19-5-default root=/dev/disk/by-id/scsi-222bc000155791fda-part2 resume=/dev/disk/by-id/scsi-222bc000155791fda-part1
  lent crashkernel=256M-:128M@16M showopts oga=0x31a
  initrd /boot/initrd-2.6.27.19-5-default

###Don't change this comment - YaST2 identifier: Original name: failsafe###
title Failsafe -- SUSE Linux Enterprise Server 11 - 2.6.27.19-5
  root (hd0,1)
  kernel /boot/vmlinuz-2.6.27.19-5-default root=/dev/disk/by-id/scsi-222bc000155791fda-part2 showopts ide=nodma apm=off noresume edd=off powersav
  hz=off highres=off processor.max_cstate=1 x11failsafe oga=0x31a
  initrd /boot/initrd-2.6.27.19-5-default

```

Figure 8. Update GRUB Menu

- b. Again, note that the disk IDs are for the original disk and not the copied disk. Change them to match the new disk ID. After changes fstab should look like the screenshot below (your disk IDs will be different).



```

Remote KVM Session to Server 3 - 8 fps
Video Device Keyboard Mouse Help

SUSE Linux
Enterprise Server

# Modified by YaST2. Last modification on Thu Apr  9 19:30:31 UTC 2009
default 0
timeout 8
##YaST - generic_mbr
gfxmenu (hd0,1)/boot/message
##YaST - activate

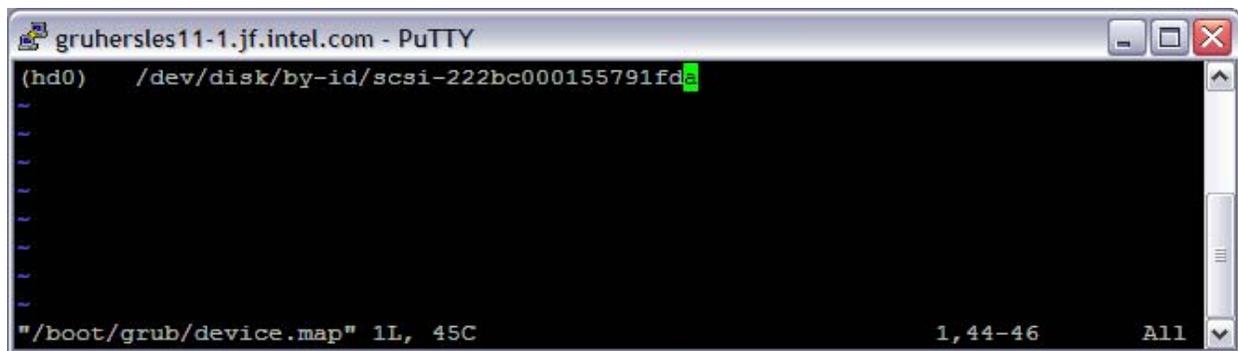
###Don't change this comment - YaST2 identifier: Original name: linux###
title SUSE Linux Enterprise Server 11 - 2.6.27.19-5
  root (hd0,1)
  kernel /boot/vmlinuz-2.6.27.19-5-default root=/dev/disk/by-id/scsi-2223e000155a7941f-part2 resume=/dev/disk/by-id/scsi-2223e000155a7941f-part1
  lent crashkernel=256M-:128M@16M showopts oga=0x31a
  initrd /boot/initrd-2.6.27.19-5-default

###Don't change this comment - YaST2 identifier: Original name: failsafe###
title Failsafe -- SUSE Linux Enterprise Server 11 - 2.6.27.19-5
  root (hd0,1)
  kernel /boot/vmlinuz-2.6.27.19-5-default root=/dev/disk/by-id/scsi-2223e000155a7941f-part2 showopts ide=nodma apm=off noresume edd=off powersav
  hz=off highres=off processor.max_cstate=1 x11failsafe oga=0x31a
  initrd /boot/initrd-2.6.27.19-5-default

```

Figure 9. Updated GRUB Menu with new Disk ID

- c. Save and exit.
9. Reboot the system with CTRL-ALT-DEL. If CTRL-ALT-DEL is not available you can reset the server through the Chassis Management Module (CMM) user interface.
  10. After reboot the system should boot normally. Log in and go to a command prompt.
  11. Edit “/boot/grub/device.map”.
    - a. It should look like the screenshot below.

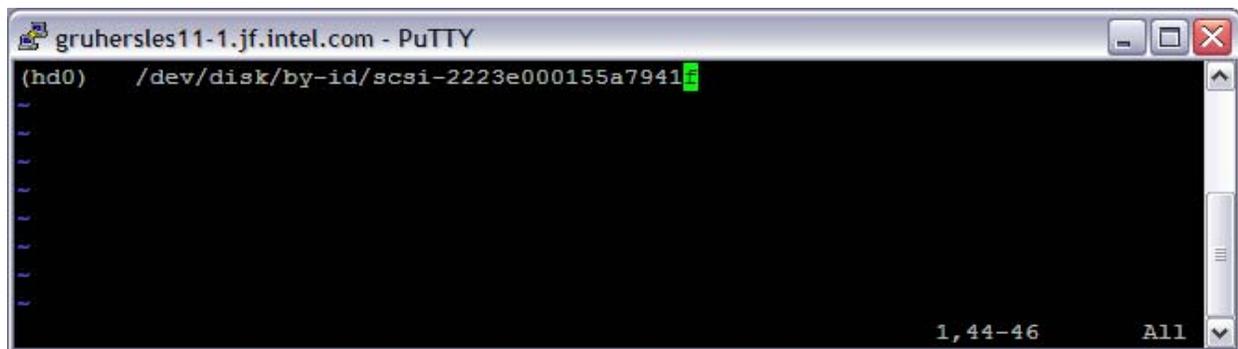
A screenshot of a PuTTY terminal window titled "gruherles11-1.jf.intel.com - PuTTY". The terminal shows the command `(hd0) /dev/disk/by-id/scsi-222bc000155791fd` with a green cursor at the end. The status bar at the bottom indicates the file being edited is `"/boot/grub/device.map"` at line 1, column 45. The terminal also shows a vertical scrollbar on the right side.

```
(hd0) /dev/disk/by-id/scsi-222bc000155791fd
```

"/boot/grub/device.map" 1L, 45C 1, 44-46 All

**Figure 10. Edit `"/boot/grub/device.map"`**

- b. Change any instances of the source disk's ID to the disk ID of the copy. After changes it should look like the screenshot below.

A screenshot of a PuTTY terminal window titled "gruherles11-1.jf.intel.com - PuTTY". The terminal shows the command `(hd0) /dev/disk/by-id/scsi-2223e000155a7941` with a green cursor at the end. The status bar at the bottom indicates the file being edited is `"/boot/grub/device.map"` at line 1, column 45. The terminal also shows a vertical scrollbar on the right side.

```
(hd0) /dev/disk/by-id/scsi-2223e000155a7941
```

"/boot/grub/device.map" 1L, 45C 1, 44-46 All

**Figure 11. Updated GRUB Device Map**

- c. Save and exit.
12. You now need to rebuild the `initrd`.
    - a. If you are running a dual SCM system with multipathing configured in the OS, run `"mkinitrd -f multipath"`.
    - b. If you are running a single SCM system run `"mkinitrd"`.
  13. Reboot the system again. You are now done and can resume using the system normally.