OpenSUSE 13.2 Increasing Disk Space on btrfs file system

This presentation shows a simple way to increase the partition size of a btrfs file system. The OpenSUSE 13.2 image is using the btrfs file system.

The presentation is a quick how to add space. This is not a detailed explaination of the btrfs commands.

Preuss
3/5/2015

opensuse_s2015a - VMware Player (Non-commercial use only)

Player

preuss : bash – Konsole

File Edit View Bookmarks Settings Help

```
preuss@opensuse-s2015a:~> df -h
Filesystem                Size  Used Avail Use% Mounted on
/dev/mapper/system-root    21G   18G  2.6G  88% /
devtmpfs                  493M     0  493M   0% /dev
tmpfs                     498M   80K  498M   1% /dev/shm
tmpfs                     498M  2.0M  496M   1% /run
tmpfs                     498M     0  498M   0% /sys/fs/cgroup
/dev/mapper/system-root    21G   18G  2.6G  88% /.snapshots
/dev/mapper/system-root    21G   18G  2.6G  88% /var/tmp
/dev/mapper/system-root    21G   18G  2.6G  88% /var/spool
/dev/mapper/system-root    21G   18G  2.6G  88% /var/opt
/dev/mapper/system-root    21G   18G  2.6G  88% /var/log
/dev/mapper/system-root    21G   18G  2.6G  88% /var/lib/named
/dev/mapper/system-root    21G   18G  2.6G  88% /var/lib/pgsql
/dev/mapper/system-root    21G   18G  2.6G  88% /var/lib/mailman
/dev/mapper/system-root    21G   18G  2.6G  88% /usr/local
/dev/mapper/system-root    21G   18G  2.6G  88% /var/crash
/dev/mapper/system-root    21G   18G  2.6G  88% /tmp
/dev/mapper/system-root    21G   18G  2.6G  88% /srv
/dev/mapper/system-root    21G   18G  2.6G  88% /opt
/dev/mapper/system-root    21G   18G  2.6G  88% /boot/grub2/i386-pc
/dev/mapper/system-home   8.0G  3.4G  4.0G  46% /home
preuss@opensuse-s2015a:~>
```

preuss : bash

Desktop

The presentation runs the df -h command as shown to see the current disk useage. Look at the report and the presentation observes the following.

Under the filesystem column, only four different filesystems are shown.
/dev/mapper/system-root
  The highest mount point is /
/dev/mapper/system-home
   The highest mount point is /home
devtmpfs
   This is a temporary /dev for increase boot performance
tmpfs
  This is a temporary file system.

The presentation is concerned with the filesystems.
/dev/mapper/system-root
  The highest mount point is /
  This filesystem is 88% full according to df and needs more space.

/dev/mapper/system-home
   The highest mount point is /home
   This filesystem is 46% full according to df and currently does not need more space.

The presentation will add disk space to /dev/mapper/system-root or on the presentation's system /.

preuss : bash – Konsole

US 03:58 PM

VMware Player (Non-commercial use only)

Player

- Home
- opensuse_s2015a
- XP_lego_s2015
- Win7-libreoffice
- AD-Win7
- Kali-s2015a
- win8_1_x64
- win7-x64-office2010-mailmerge
- Lectcomm_13_1

Welcome to VMware Player

Create a New Virtual Machine

Create a new virtual machine, which will then be added to the top of your library.

Open a Virtual Machine

Open an existing virtual machine, which will then be added to the top of your library.

Upgrade to VMware Workstation

Get advanced features such as snapshots, developer tool integration, and more.

Help

View VMware Player's help contents.

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The presentation powers off the virtual machine.

VMware Player (Non-commercial use only)

Player

- Home
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- Lectcomm_13_1

opensuse_s2015a

State: Powered Off
OS: Other Linux 3.x kernel
Version: Workstation 11.0 virtual machine
RAM: 1 GB

Play virtual machine

Edit virtual machine settings

The presentation will edit virtual machine settings of the linux virtual machine with btrfs.

Virtual Machine Settings

Hardware | Options

Device	Summary
Memory	1 GB
Processors	1
Hard Disk (SCSI)	35 GB
CD/DVD (IDE)	Using file openSUSE-13.2-DVD-i58...
Network Adapter	NAT
USB Controller	Present
Sound Card	Auto detect
Display	Auto detect

Add... Remove

Device status

Connected

Connect at power on

Connection

Use physical drive:

Auto detect

Use ISO image file:

openSUSE-13.2-DVD-i586.iso Browse...

Advanced...

OK Cancel Help

The presentation will select Add. This will allow adding another virtual disk drive.

Virtual Machine Settings

Hardware | Options

Device	Summary
Memory	1 GB
Processors	1
Hard Disk (SCS	
CD/DVD (IDE)	
Network Adap	
USB Controller	
Sound Card	
Display	

Device status

Connected

Connect at power on

Browse...

Advanced...

Add Hardware Wizard

Hardware Type

What type of hardware do you want to install?

Hardware types:

Hard Disk

CD/D rive

Flopp ive

Netw Adapter

Device

Explanation

Add a hard disk.

< Back | Next > | Cancel

The presentation selects Hard Disk, then Next.

Add... | Remove

OK | Cancel | Help

Virtual Machine Settings

Hardware | Options

Device	Summary
Memory	1 GB
Processors	1
Hard Disk (SCS	
CD/DVD (IDE)	
Network Adap	
USB Controller	
Sound Card	
Display	

Device status

Connected

Connect at power on

Browse...

Advanced...

dd...

Remove

OK | Cancel | Help

Add Hardware Wizard

Select a Disk Type

What kind of disk do you want to create?

Virtual disk type

IDE

SCSI (Recommended)

S

< Back | Next > | Cancel

The presentation leaves the default selection of interface. SCSI is a good choice for this situation.

Virtual Machine Settings

Hardware | Options

Device	Summary
Memory	1 GB
Processors	1
Hard Disk (SCS	
CD/DVD (IDE)	
Network Adap	
USB Controller	
Sound Card	
Display	

Device status

Connected

Connect at power on

Browse...

Advanced...

Add Hardware Wizard

Select a Disk

Which disk do you want to use?

Disk

Create a new virtual disk

A virtual disk is co ed of one or more files on the host file system, which will appear as a si hard disk to the guest operating system. Virtual disks can easily be copie moved on the same host or between hosts.

e a previously configured disk.

vanced users)

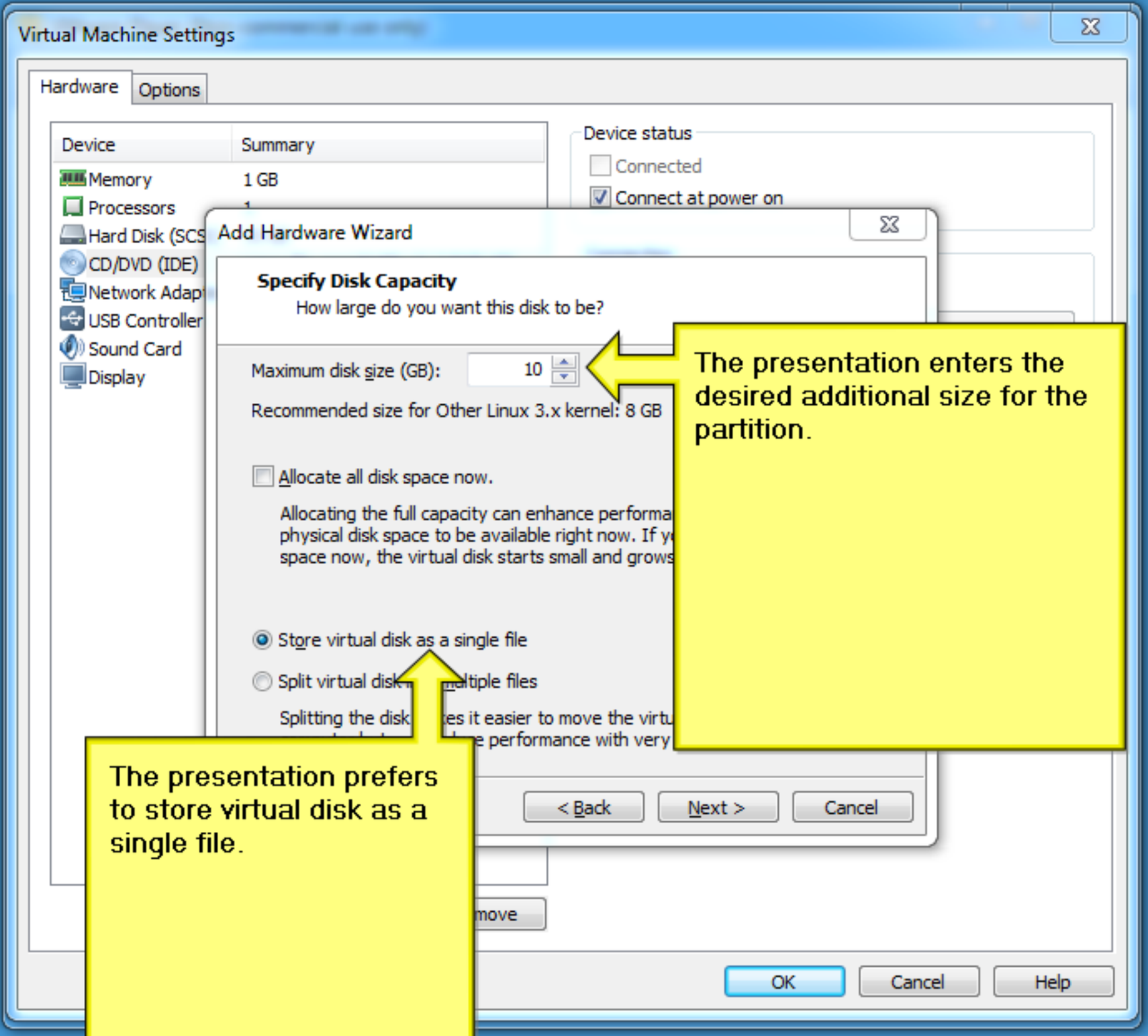
the virtual machine direct access to a local hard

< Back | Next > | Cancel

move

OK | Cancel | Help

The presentation selects Create a new virtual disk, then the presentation selects Next.


Virtual Machine Settings
Hardware
Options
Device
Summary
Memory
1 GB
Processors
Hard Disk (SCS
CD/DVD (IDE)
Network Adap
USB Controller
Sound Card
Display
Device status
Connected
Connect at power on
Add Hardware Wizard
Specify Disk Capacity
How large do you want this disk to be?
Maximum disk size (GB):
10
Recommended size for Other Linux 3.x kernel: 8 GB
Allocate all disk space now.
Allocating the full capacity can enhance performa
physical disk space to be available right now. If y
space now, the virtual disk starts small and grows
Store virtual disk as a single file
Split virtual disk
ltiple files
Splitting the disk
es it easier to move the virtu
e performance with very
< Back
Next >
Cancel
move
OK
Cancel
Help
The presentation enters the desired additional size for the partition.
The presentation prefers to store virtual disk as a single file.

Virtual Machine Settings

Hardware | Options

Device	Summary
Memory	1 GB
Processors	1
Hard Disk (SCS	
CD/DVD (IDE)	
Network Adap	
USB Controller	
Sound Card	
Display	

Add... | Remove

Device status

Connected

Connect at power on

Browse...

Advanced...

OK

Add Hardware Wizard

Specify Disk File

Where would you like to store the disk file?

Disk file

One disk file will be created for each 2 GB of virtual disk capacity. File names for each file beyond the first will be automatically generated using the file name provided here as a basis.

File name: opensuse_s2015a-3.vmdk Browse...

< Back | Finish | Cancel

The presentation leaves the default name. The presentation selects Finish.

Virtual Machine Settings

Hardware | Options

Device	Summary
Memory	1 GB
Processors	1
Hard Disk (SCSI)	35 GB
New Hard Disk ...	10 GB
CD/DVD (IDE)	Using file openSUSE-13.2-DV
Network Adapter	NAT
USB Controller	Present
Sound Card	Auto detect
Display	Auto detect

Add... | Remove

Disk file

opensuse_s2015a-3.vmdk

d disk.

le.

Map...

Defragment

Expand disk capacity.

Expand...

Compact disk to reclaim unused space.

Compact

Advanced...

OK | Cancel | Help

The presentation sees the additional disk is ready for use.

VMware Player (Non-commercial use only)

Player

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- Win7-libreoffice
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- Kali-s2015a
- win8_1_x64
- win7-x64-office2010-mailmerge
- Lectcomm_13_1

opensuse_s2015a

State: Powered Off
OS: Other Linux 3.x kernel
Version: Workstation 11.0 virtual machine
RAM: 1 GB

Play virtual machine

Edit virtual machine settings

The presentation does a power on for the virtual machine with btrfs.

opensuse_s2015a - VMware Player (Non-commercial use only)

Player

preuss : bash – Konsole

File Edit View Bookmarks Settings Help

```
preuss@opensuse-s2015a:~> df -h
Filesystem               Size  Used Avail Use% Mounted on
/dev/mapper/system-root   21G   18G  2.6G  88% /
devtmpfs                 493M     0  493M   0% /dev
tmpfs                    498M   76K  498M   1% /dev/shm
tmpfs                    498M  2.0M  496M   1% /run
tmpfs                    498M     0  498M   0% /sys/fs/cgroup
/dev/mapper/system-root   21G   18G  2.6G  88% /.snapshots
/dev/mapper/system-root   21G   18G  2.6G  88% /var/tmp
/dev/mapper/system-root   21G   18G  2.6G  88% /var/spool
/dev/mapper/system-root   21G   18G  2.6G  88% /var/opt
/dev/mapper/system-root   21G   18G  2.6G  88% /var/log
/dev/mapper/system-root   21G   18G  2.6G  88% /var/lib/pgsql
/dev/mapper/system-root   21G   18G  2.6G  88% /var/lib/named
/dev/mapper/system-root   21G   18G  2.6G  88% /var/lib/mailman
/dev/mapper/system-root   21G   18G  2.6G  88% /var/crash
/dev/mapper/system-root   21G   18G  2.6G  88% /usr/local
/dev/mapper/system-root   21G   18G  2.6G  88% /tmp
/dev/mapper/system-root   21G   18G  2.6G  88% /srv
/dev/mapper/system-root   21G   18G  2.6G  88% /opt
/dev/mapper/system-root   21G   18G  2.6G  88% /boot/grub2/i386-pc
/dev/mapper/system-home  8.0G  3.4G  4.0G  46% /home
preuss@opensuse-s2015a:~>
```

The presentation observes nothing has changed with file system size.

preuss : bash

Desktop

Konsole

US 04:05 PM

opensuse_s2015a - VMware Player (Non-commercial use only)

Player

preuss : bash – Konsole

File Edit View Bookmarks Settings Help

```
preuss@opensuse-s2015a:~> df -h
Filesystem               Size  Used Avail Use% Mounted on
/dev/mapper/system-root   21G   18G  2.6G  88% /
devtmpfs                 493M     0  493M   0% /dev
tmpfs                    498M   76K  498M   1% /dev/shm
tmpfs                    498M  2.0M  496M   1% /run
tmpfs                    498M     0  498M   0% /sys/fs/cgroup
/dev/mapper/system-root   21G   18G  2.6G  88% /.snapshots
/dev/mapper/system-root   21G   18G  2.6G  88% /var/tmp
/dev/mapper/system-root   21G   18G  2.6G  88% /var/spool
/dev/mapper/system-root   21G   18G  2.6G  88% /var/opt
/dev/mapper/system-root   21G   18G  2.6G  88% /var/log
/dev/mapper/system-root   21G   18G  2.6G  88% /var/lib/pgsql
/dev/mapper/system-root   21G   18G  2.6G  88% /var/lib/named
/dev/mapper/system-root   21G   18G  2.6G  88% /var/lib/mailman
/dev/mapper/system-root   21G   18G  2.6G  88% /var/crash
/dev/mapper/system-root   21G   18G  2.6G  88% /usr/local
/dev/mapper/system-root   21G   18G  2.6G  88% /tmp
/dev/mapper/system-root   21G   18G  2.6G  88% /srv
/dev/mapper/system-root   21G   18G  2.6G  88% /opt
/dev/mapper/system-root   21G   18G  2.6G  88% /boot/grub2/i386-pc
/dev/mapper/system-home  8.0G  3.4G  4.0G  46% /home
preuss@opensuse-s2015a:~> su
Password:
opensuse-s2015a:/home/preuss # btrfs filesystem show
Label: none  uuid: 503cc77a-85e9-4f2b-b3f1-918ed9df0eb3
        Total devices 1 FS bytes used 16.42GiB
        devid    1 size 20.53GiB used 19.29GiB path /dev/mapper/system-root

Label: none  uuid: 33bf0cea-8fd9-41f6-abd0-4b5c7594cd5c
        Total devices 1 FS bytes used 3.26GiB
        devid    1 size 8.00GiB used 8.00GiB path /dev/mapper/system-home

Btrfs v3.16.2+20141003
opensuse-s2015a:/home/preuss #
```

The presentation becomes root as shown. The btrfs command shows the currently used disks and mappings.

Desktop

preuss : bash

preuss : bash

Konsole

US

04:05 PM

opensuse_s2015a - VMware Player (Non-commercial use only)

Player

preuss : bash - Konsole

File Edit View Bookmarks Settings Help

```
opensuse-s2015a:/home/preuss # btrfs device add /dev/sdb /
opensuse-s2015a:/home/preuss #
```

Desktop

The presentation adds /dev/sdb to the root or / partition with the command shown.

preuss : bash

Konsole

US 04:06 PM

opensuse_s2015a - VMware Player (Non-commercial use only)

Player

preuss : bash – Konsole

File Edit View Bookmarks Settings Help

```
opensuse-s2015a:/home/preuss # btrfs filesystem show /
Label: none  uuid: 503cc77a-85e9-4f2b-b3f1-918ed9df0eb3
        Total devices 2 FS bytes used 16.42GiB
        devid    1 size 20.53GiB used 19.29GiB path /dev/mapper/system-root
        devid    2 size 10.00GiB used 0.00B path /dev/sdb

Btrfs v3.16.2+20141003
opensuse-s2015a:/home/preuss #
```

The presentation checks the btrfs / partition for disk maps.

Desktop

preuss : bash

Konsole

US 04:07 PM

opensuse_s2015a - VMware Player (Non-commercial use only)

Player

preuss : bash - Konsole

File Edit View Bookmarks Settings Help

```
opensuse-s2015a:/home/preuss # btrfs filesystem resize max /
Resize '/' of 'max'
opensuse-s2015a:/home/preuss #
```

Desktop

The presentation uses the btrfs command to resize the / partition using all the newly available space.

preuss : bash

preuss : bash – Konsole

2 US 04:32 PM

opensuse_s2015a - VMware Player (Non-commercial use only)

Player

preuss : bash – Konsole

File Edit View Bookmarks Settings Help

```
opensuse-s2015a:/home/preuss # df -h
Filesystem               Size  Used Avail Use% Mounted on
/dev/mapper/system-root   31G   18G   13G  59% /
devtmpfs                 493M  8.0K  493M   1% /dev
tmpfs                    498M   76K  498M   1% /dev/shm
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tmpfs                    498M     0  498M   0% /sys/fs/cgroup
/dev/mapper/system-root   31G   18G   13G  59% /.snapshots
/dev/mapper/system-root   31G   18G   13G  59% /var/tmp
/dev/mapper/system-root   31G   18G   13G  59% /var/spool
/dev/mapper/system-root   31G   18G   13G  59% /var/opt
/dev/mapper/system-root   31G   18G   13G  59% /var/log
/dev/mapper/system-root   31G   18G   13G  59% /var/lib/pgsql
/dev/mapper/system-root   31G   18G   13G  59% /var/lib/named
/dev/mapper/system-root   31G   18G   13G  59% /var/lib/mailman
/dev/mapper/system-root   31G   18G   13G  59% /var/crash
/dev/mapper/system-root   31G   18G   13G  59% /usr/local
/dev/mapper/system-root   31G   18G   13G  59% /tmp
/dev/mapper/system-root   31G   18G   13G  59% /srv
/dev/mapper/system-root   31G   18G   13G  59% /opt
/dev/mapper/system-root   31G   18G   13G  59% /boot/grub2/i386-pc
/dev/mapper/system-home  8.0G  3.4G  4.0G  46% /home
opensuse-s2015a:/home/preuss #
```

The presentation observes the df command is showing more available disk space.

Desktop

preuss : bash

preuss : bash – Konsole

US 04:34 PM