

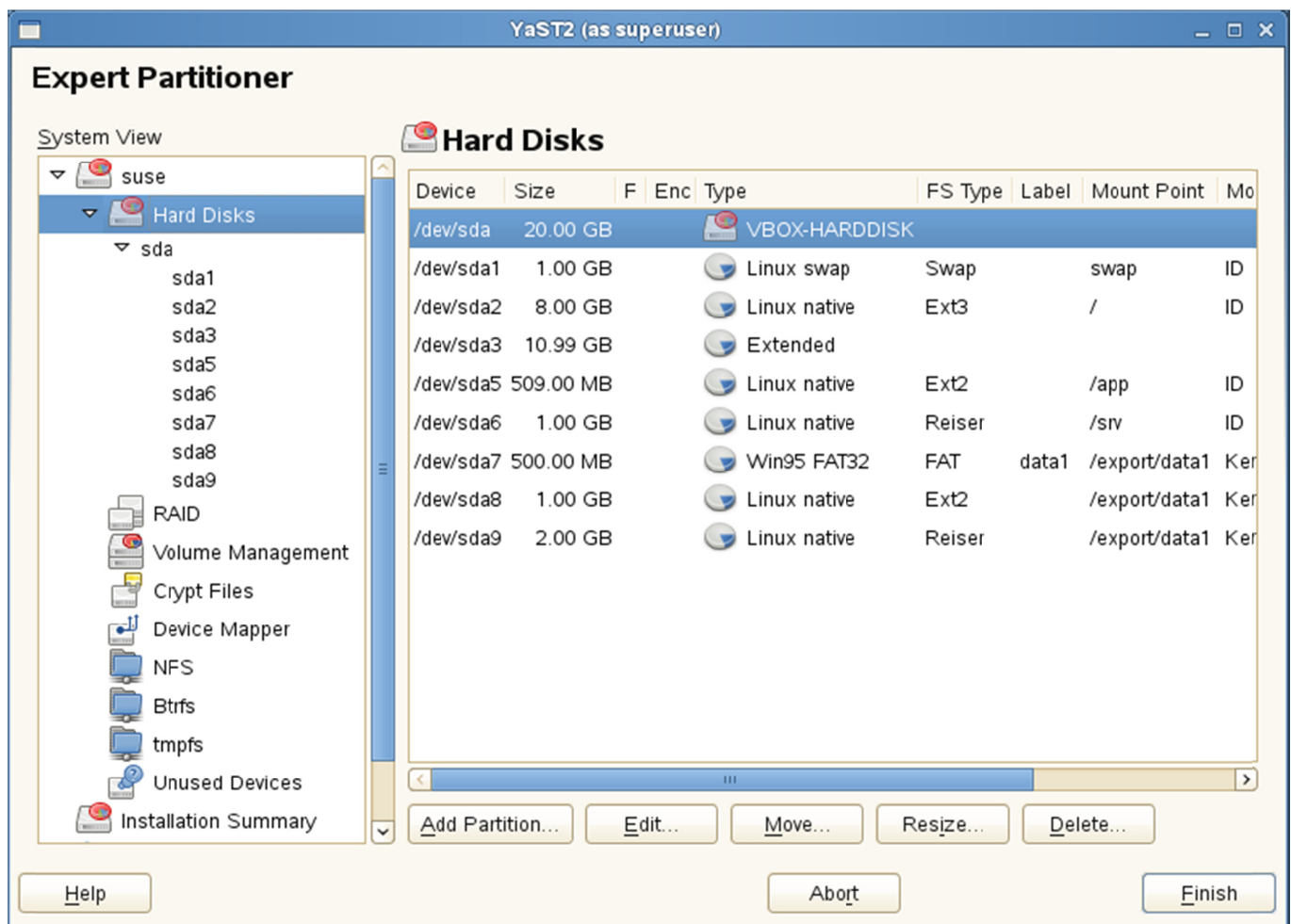
Współczesne systemy komputerowe

Zarządzanie partycjami i systemem plików

1. Tworzenie partycji i systemów plików z YaST.

- Zmień użytkownika na *root*, i uruchom narzędzie *yast2*;

```
user@suse:~> su -  
Password:  
suse:~ # yast2 disk
```



- Utwórz partycję (**ADD**) rozszerzoną (**Extended Partition**) na pozostałej części dysku;
- Utwórz partycję logiczną (**Logical Partition**) z systemem plików **Ext2**, o wielkości **+500M** z punktem montowania **/apps**;
- Utwórz partycję logiczną z systemem plików **Reiser**, o wielkości **+1G** z punktem montowania **/srv**;
- Sprawdź czy partycje są zamontowane;

```
suse:~ # mount  
/dev/sda2 on / type ext3 (rw,ac1,user_xattr)
```

```

proc on /proc type proc (rw)
sysfs on /sys type sysfs (rw)
devtmpfs on /dev type devtmpfs (rw,mode=0755)
tmpfs on /dev/shm type tmpfs (rw,mode=1777)
devpts on /dev/pts type devpts (rw,mode=0620,gid=5)
fusectl on /sys/fs/fuse/connections type fusectl (rw)
gvfs-fuse-daemon on /home/user/.gvfs type fuse.gvfs-fuse-daemon
(rw,nosuid,nodev,user=user)
/dev/sda5 on /app type ext2 (rw,acl,user_xattr)
/dev/sda6 on /srv type reiserfs (rw,acl,user_xattr)

```

- Sprawdź zawartość pliku **/etc/fstab**;

```

suse:~ # cat /etc/fstab
/dev/disk/by-id/ata-VBOX_HARDDISK_VB65d16bc9-fba9108a-part1 swap          swap
defaults                                0 0
/dev/disk/by-id/ata-VBOX_HARDDISK_VB65d16bc9-fba9108a-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
/dev/disk/by-id/ata-VBOX_HARDDISK_VB65d16bc9-fba9108a-part5 /app       ext2
acl,user_xattr                          1 2
/dev/disk/by-id/ata-VBOX_HARDDISK_VB65d16bc9-fba9108a-part6 /srv       reiserfs  acl,user_xattr 1 2

```

- Aktualna zawartość katalogu **/srv** nie jest dostępna, katalog został użyty jako punkt montowania dla pustej partycji, odmontuj partycję **/srv**;

```

suse:~ # umount /srv
suse:~ # mount
/dev/sda2 on / type ext3 (rw,acl,user_xattr)
proc on /proc type proc (rw)
sysfs on /sys type sysfs (rw)
devtmpfs on /dev type devtmpfs (rw,mode=0755)
tmpfs on /dev/shm type tmpfs (rw,mode=1777)
devpts on /dev/pts type devpts (rw,mode=0620,gid=5)
fusectl on /sys/fs/fuse/connections type fusectl (rw)
gvfs-fuse-daemon on /home/user/.gvfs type fuse.gvfs-fuse-daemon
(rw,nosuid,nodev,user=user)
/dev/sda5 on /app type ext2 (rw,acl,user_xattr)

```

- Zamontuj tymczasowo partycję **/dev/sda6** do katalogu **/mnt** przenieś zawartość **/srv** na nową partycję **/dev/sda6**;

```

suse:~ # mount -t reiserfs /dev/sda6 /mnt
suse:~ # mv /srv/* /mnt
suse:~ # umount /mnt

```

- Zamontuj wszystkie systemy plików wymienione w **/etc/fstab**;

```

suse:~ # mount -a
suse:~ # mount
/dev/sda2 on / type ext3 (rw,acl,user_xattr)
proc on /proc type proc (rw)
sysfs on /sys type sysfs (rw)
devtmpfs on /dev type devtmpfs (rw,mode=0755)

```

```
tmpfs on /dev/shm type tmpfs (rw,mode=1777)
devpts on /dev/pts type devpts (rw,mode=0620,gid=5)
fusectl on /sys/fs/fuse/connections type fusectl (rw)
gvfs-fuse-daemon on /home/user/.gvfs type fuse.gvfs-fuse-daemon
(rw,nosuid,nodev,user=user)
/dev/sda5 on /app type ext2 (rw,acl,user_xattr)
/dev/sda6 on /srv type reiserfs (rw,acl,user_xattr)
suse:~ # ls /srv
ftp www
```

2. Ręczne tworzenie partycji.

- Sprawdź układ partycji na dysku; dyski **IDE** są urządzeniami o nazwie **/dev/hax**, **SATA** i **SCSI** przez **/dev/sdX**;

```
suse:~ # fdisk -l

Disk /dev/sda: 21.5 GB, 21474836480 bytes
255 heads, 63 sectors/track, 2610 cylinders, total 41943040 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000a86fa

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1                2048     2105343    1051648   82  Linux swap / Solaris
/dev/sda2 *          2105344     18876415    8385536   83  Linux
/dev/sda3            18876416     41943039   11533312    f  W95 Ext'd (LBA)
/dev/sda5            18878464     19920895     521216   83  Linux
/dev/sda6            19922944     22024191    1050624   83  Linux
```

- Uruchom narzędzie **fdisk** i sprawdź partycje na dysku komendą **m**;

```
suse:~ # fdisk /dev/sda

Command (m for help): m
Command action
  a  toggle a bootable flag
  b  edit bsd disklabel
  c  toggle the dos compatibility flag
  d  delete a partition
  l  list known partition types
  m  print this menu
  n  add a new partition
  o  create a new empty DOS partition table
  p  print the partition table
  q  quit without saving changes
  s  create a new empty Sun disklabel
  t  change a partition's system id
  u  change display/entry units
  v  verify the partition table
  w  write table to disk and exit
  x  extra functionality (experts only)
```

- Sprawdź partycje na dysku komendą **p**;

```
Command (m for help): p
```

```
Disk /dev/sda: 21.5 GB, 21474836480 bytes
255 heads, 63 sectors/track, 2610 cylinders, total 41943040 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000a86fa
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1		2048	2105343	1051648	82	Linux swap / Solaris
/dev/sda2	*	2105344	18876415	8385536	83	Linux
/dev/sda3		18876416	41943039	11533312	f	W95 Ext'd (LBA)
/dev/sda5		18878464	19920895	521216	83	Linux
/dev/sda6		19922944	22024191	1050624	83	Linux

- Utwórz nową partycję logiczną **FAT32** o wielkości **500MB**;

```
Command (m for help): n
Command action
  l   logical (5 or over)
  p   primary partition (1-4)
l
First sector (22026240-41943039, default 22026240):
Using default value 22026240
Last sector, +sectors or +size{K,M,G} (22026240-41943039, default 41943039): +500M

Command (m for help): t
Partition number (1-7): 7
Hex code (type L to list codes): L

 0 Empty                24 NEC DOS              81 Minix / old Lin     bf Solaris
 1 FAT12                 27 Hidden NTFS Win    82 Linux swap / So    c1 DRDOS/sec (FAT-
 2 XENIX root            39 Plan 9              83 Linux               c4 DRDOS/sec (FAT-
 3 XENIX usr             3c PartitionMagic     84 OS/2 hidden C:    c6 DRDOS/sec (FAT-
 4 FAT16 <32M           40 Venix 80286        85 Linux extended    c7 Syrinx
 5 Extended             41 PPC PReP Boot     86 NTFS volume set  da Non-FS data
 6 FAT16                 42 SFS                 87 NTFS volume set  db CP/M / CTOS / .
 7 HPFS/NTFS/exFAT     4d QNX4.x              88 Linux plaintext   de Dell Utility
 8 AIX                   4e QNX4.x 2nd part    8e Linux LVM         df BootIt
 9 AIX bootable         4f QNX4.x 3rd part    93 Amoeba            e1 DOS access
 a OS/2 Boot Manag     50 OnTrack DM          94 Amoeba BBT        e3 DOS R/O
 b W95 FAT32            51 OnTrack DM6 Aux    9f BSD/OS            e4 SpeedStor
 c W95 FAT32 (LBA)     52 CP/M                a0 IBM Thinkpad    hi eb BeOS fs
 e W95 FAT16 (LBA)     53 OnTrack DM6 Aux    a5 FreeBSD          ee GPT
 f W95 Ext'd (LBA)     54 OnTrackDM6         a6 OpenBSD          ef EFI (FAT-12/16/
10 OPUS                 55 EZ-Drive           a7 NeXTSTEP         f0 Linux/PA-RISC b
11 Hidden FAT12         56 Golden Bow         a8 Darwin UFS       f1 SpeedStor
12 Compaq diagnost     5c Priam Edisk        a9 NetBSD            f4 SpeedStor
14 Hidden FAT16 <3     61 SpeedStor          ab Darwin boot     f2 DOS secondary
16 Hidden FAT16         63 GNU HURD or Sys   af HFS / HFS+       fb VMware VMFS
17 Hidden HPFS/NTF     64 Novell Netware    b7 BSDI fs          fc VMware VMKCORE
18 AST SmartSleep      65 Novell Netware    b8 BSDI swap        fd Linux raid auto
1b Hidden W95 FAT3     70 DiskSecure Mult   bb Boot Wizard hid  fe LANstep
1c Hidden W95 FAT3     75 PC/IX              be Solaris boot    ff BBT
1e Hidden W95 FAT1     80 Old Minix

Hex code (type L to list codes): b
Changed system type of partition 7 to b (W95 FAT32)
```

- Sprawdź układ partycji na dysku;

```
Command (m for help): p
```

```
Disk /dev/sda: 21.5 GB, 21474836480 bytes
255 heads, 63 sectors/track, 2610 cylinders, total 41943040 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000a86fa
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1		2048	2105343	1051648	82	Linux swap / Solaris
/dev/sda2	*	2105344	18876415	8385536	83	Linux
/dev/sda3		18876416	41943039	11533312	f	W95 Ext'd (LBA)
/dev/sda5		18878464	19920895	521216	83	Linux
/dev/sda6		19922944	22024191	1050624	83	Linux

- Utwórz dwie kolejne Linuksowe (domyślny typ partycji) partycje o wielkościach **+1G** i **+2G**;
- Sprawdź i zapisz układ partycji;

```
Command (m for help): p
```

```
Disk /dev/sda: 21.5 GB, 21474836480 bytes
255 heads, 63 sectors/track, 2610 cylinders, total 41943040 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x000a86fa
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1		2048	2105343	1051648	82	Linux swap / Solaris
/dev/sda2	*	2105344	18876415	8385536	83	Linux
/dev/sda3		18876416	41943039	11533312	f	W95 Ext'd (LBA)
/dev/sda5		18878464	19920895	521216	83	Linux
/dev/sda6		19922944	22024191	1050624	83	Linux
/dev/sda7		22026240	23050239	512000	b	W95 FAT32
/dev/sda8		23052288	25149439	1048576	83	Linux
/dev/sda9		25151488	29345791	2097152	83	Linux

```
Command (m for help): w
```

```
The partition table has been altered!
```

```
Calling ioctl() to re-read partition table.
```

```
WARNING: Re-reading the partition table failed with error 16: Device or resource busy.
The kernel still uses the old table. The new table will be used at
the next reboot or after you run partprobe(8) or kpartx(8)
```

```
WARNING: If you have created or modified any DOS 6.x
partitions, please see the fdisk manual page for additional
information.
Syncing disks.
```

- Sprawdź tablicę partycji widzianą przez jądro systemu;

```
suse:~ # cat /proc/partitions
major minor #blocks name
8 0 20971520 sda
8 1 1051648 sda1
8 2 8385536 sda2
8 3 1 sda3
```

```

8      5      521216 sda5
8      6      1050624 sda6

```

- Aby jądro przeładowało tablicę partycji należy zrestartować komputer (**reboot** lub **shutdown -r now**) lub wydać polecenie **partprobe**;

```

suse:~ # partprobe
suse:~ # cat /proc/partitions
major minor #blocks name
      8      0    20971520 sda
      8      1     1051648 sda1
      8      2     8385536 sda2
      8      3           1 sda3
      8      5      521216 sda5
      8      6     1050624 sda6
      8      7      512000 sda7
      8      8     1048576 sda8
      8      9      2097152 sda9

```

3. Ręczne tworzenie systemów plików.

- Na partycji **/dev/sda7** załóż system plików **FAT32**; następnie **ext2** na partycji **/dev/sda8** i **reiserfs** na **/dev/sda9**

```

suse:~ # mkfs.msdos -n data1 /dev/sda7
mkfs.msdos 2.11 (12 Mar 2005)
suse:~ # mkfs -t ext2 -v /dev/sda8
mke2fs 1.41.9 (22-Aug-2009)
fs_types for mke2fs.conf resolution: 'ext2', 'default'
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
65536 inodes, 262144 blocks
13107 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
8 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376

Writing inode tables: done
Writing superblocks and filesystem accounting information: done

This filesystem will be automatically checked every 30 mounts or
180 days, whichever comes first.  Use tune2fs -c or -i to override.
suse:~ # mkreiserfs /dev/sda9 160000
mkreiserfs 3.6.21 (2009 www.namesys.com)

A pair of credits:
SuSE (www.suse.com) pays for continuing work on journaling for version 3, paid
for much of the previous version 3 work, and is paying for Chris and Jeff to do
V3 maintenance. Reiserfs integration in their distro is consistently solid, and
they were key to our becoming widely used.

```

Vladimir Saveliev started as the most junior programmer on the team, and became the lead programmer. He is now an experienced highly productive programmer. He wrote the extent handling code for Reiser4, plus parts of the balancing code and file write and file read.

```

Guessing about desired format.. Kernel 3.0.13-0.27-default is running.
Format 3.6 with standard journal
Count of blocks on the device: 160000
Number of blocks consumed by mkreiserfs formatting process: 8216
Blocksize: 4096
Hash function used to sort names: "r5"
Journal Size 8193 blocks (first block 18)
Journal Max transaction length 1024
inode generation number: 0
UUID: 5137ad86-95fd-4ea0-931b-e920fa82b33c
ATTENTION: YOU SHOULD REBOOT AFTER FDISK!
        ALL DATA WILL BE LOST ON '/dev/sda9'!
Continue (y/n):y
Initializing journal - 0%....20%....40%....60%....80%....100%
Syncing..ok
ReiserFS is successfully created on /dev/sda9.

```

- Utwórz podkatalogi **data1**, **data2** i **data3** w katalogu **/export**;

```

suse:~ # mkdir -p /export/data{1,2,3}
suse:~ # ls -l /export
total 12
drwxr-xr-x 2 root root 4096 Mar 19 09:04 data1
drwxr-xr-x 2 root root 4096 Mar 19 09:04 data2
drwxr-xr-x 2 root root 4096 Mar 19 09:04 data3

```

- Dodaj następujące linie do pliku **/etc/fstab**, skorzystaj edytor **vi**;

```

/dev/sda7 /export/data1 vfat defaults 1 2
/dev/sda8 /export/data2 ext2 defaults 1 2
/dev/sda9 /export/data3 reiserfs defaults 1 2

```

- Zamontuj wszystkie systemy plików;

```

suse:~ # mount -a

```

- Wyświetl informacje o zamontowanych systemach plików;

```

suse:~ # mount
/dev/sda2 on / type ext3 (rw,acl,user_xattr)
proc on /proc type proc (rw)
sysfs on /sys type sysfs (rw)
devtmpfs on /dev type devtmpfs (rw,mode=0755)
tmpfs on /dev/shm type tmpfs (rw,mode=1777)
devpts on /dev/pts type devpts (rw,mode=0620,gid=5)
fusectl on /sys/fs/fuse/connections type fusectl (rw)
gvfs-fuse-daemon on /home/user/.gvfs type fuse.gvfs-fuse-daemon
(rw,nosuid,nodev,user=user)
/dev/sda5 on /app type ext2 (rw,acl,user_xattr)
/dev/sda6 on /srv type reiserfs (rw,acl,user_xattr)
/dev/sda7 on /export/data1 type vfat (rw)
/dev/sda8 on /export/data1 type ext2 (rw)
/dev/sda9 on /export/data1 type reiserfs (rw)

```



```
suse:~ # cat /proc/mounts
rootfs / rootfs rw 0 0
udev /dev tmpfs rw,relatime,nr_inodes=0,mode=755 0 0
tmpfs /dev/shm tmpfs rw,relatime 0 0
/dev/sda2 / ext3 rw,relatime,errors=continue,user_xattr,acl,barrier=1,data=ordered 0 0
proc /proc proc rw,relatime 0 0
sysfs /sys sysfs rw,relatime 0 0
devpts /dev/pts devpts rw,relatime,gid=5,mode=620,ptmxmode=000 0 0
fusectl /sys/fs/fuse/connections fusectl rw,relatime 0 0
debugfs /sys/kernel/debug debugfs rw,relatime 0 0
gvfs-fuse-daemon /home/user/.gvfs fuse.gvfs-fuse-daemon
    rw,nosuid,nodev,relatime,user_id=1000,group_id=100 0 0
/dev/sda5 /app ext2 rw,relatime,errors=continue,user_xattr,acl 0 0
/dev/sda6 /srv reiserfs rw,relatime,acl,user_xattr 0 0
/dev/sda7 /export/data1 vfat
    rw,relatime,mask=0022,dmask=0022,codepage=cp437,iocharset=iso8859-
    1,shortname=mixed,errors=remount-ro 0 0
/dev/sda8 /export/data1 ext2 rw,relatime,errors=continue 0 0
/dev/sda9 /export/data1 reiserfs rw,relatime 0 0
```

- Sprawdź działanie polecenia **cfdisk**;
- Przejrzyj manuale do poleceń **e2fsck**, **dumpe2fs** i **tune2fs**;
- Poszukaj w internecie informacji o programie *GParted*;
- Poszukaj w internecie informacji o dystrybucji *Parted Magic*;