Oscar Petersson, Matteus Laurent
oscpe262, matla782

# TDDI41 Lab report

Högskoleingenjörsutbildning i datateknik, 180 hp

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**System Administration**
TDDI41, Linköpings universitet

Assistant:
Jon Dybeck
IDA

## Exercise 1: Very basic RAID theory

**RAID** originally stood for *"Redundant Array of Independent Disks"*, but nowadays, it is commonly known as *"Array of Independent Disks"*, i.e. a collection of storage media working as a single logical unit.

**JBOD** (*"Just a Bunch Of Disks"*) is multiple drives exposed as individual devices. Sometimes, the conception of spanned disks is expressed as 'JBOD'.

**RAID-0** (*"Striping"*) distributes the content (near-) equally across all disks to increase throughput. Any disk failure results in a full array failure.

**RAID-1** (*"Mirroring"*) writes the data set identically to two drives, basically allowing a "backup" in case of one of the disks failuring.

**RAID-5** (*"Block-level striping with distributed parity"*) requires at least three disks, distributing data across two with parity on the third. This allows one disk to fail with the possibility to recover the array.

**RAID-6** (*"Block-level striping with double distributed parity"*) requires at least four disks, distributing data as RAID 5 but with parity on two disks.

**RAID 1+0** (*"Mirrored stripes"*) stripes data across two sets of disks which are in turn mirrored.

**RAID 0+1** (*"Stripe of mirrors"*) mirrors data and stripes the mirrored sets.

**Hot Spare** is a disk added to a failure redunant array, such as RAID-5, which is used only upon an array failure, at which point the array can start to rebuild instantly.

## Exercise 2: Volume management with LVM2

A physical disk is divided into one or more **Physical volumes** (`pv[command]`). Combining these makes **Volume groups** (`vg[command]`) which consists of any number of **Logical volumes** (`lv[command]`).

## Exercise 3: File Systems

The main differences between ext2 and ext3 is the addition of journaling (block and metadata) in ext3, and the possibility to grow a mounted file system on the latter.

Ext*n* file systems are created with the command:

```
mkfs.extn <device>
```

Ext file systems are resized with: `resize2fs <device> <size>`

`fsck` is used to check and repair Linux file systems.