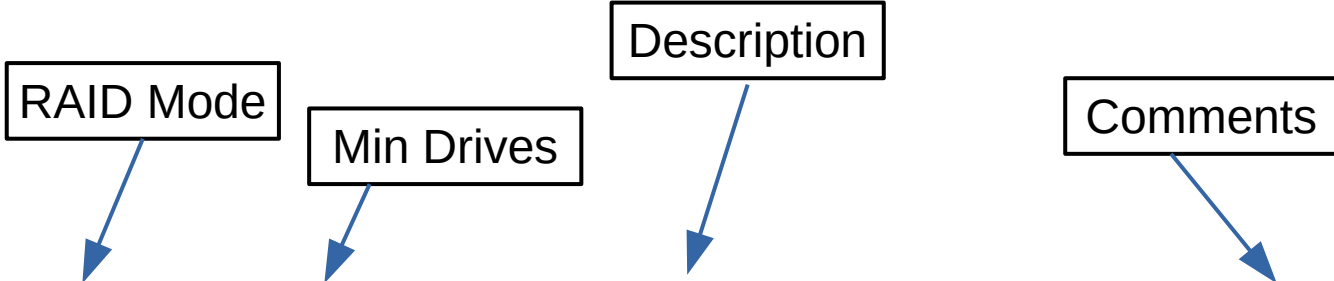# Managing Storage

LVM & RAID

LVM

- Logical Volume Management

- Pooling multiple storage devices as a single logical volume

- lvm2 tools : create and manage virtual block devices from physical devices
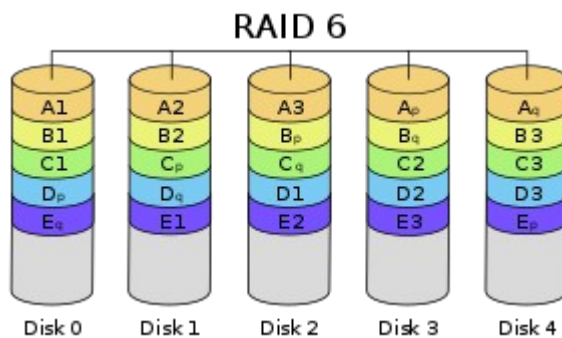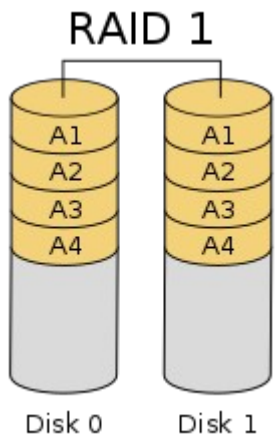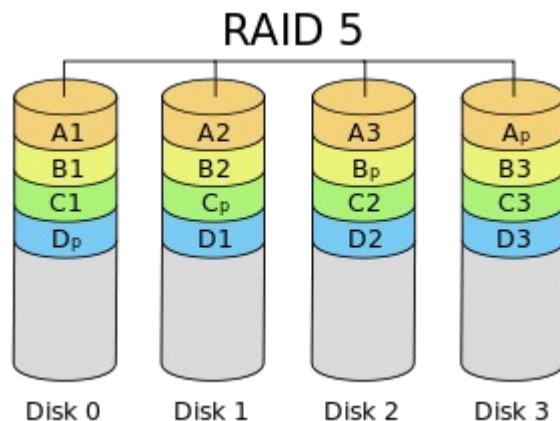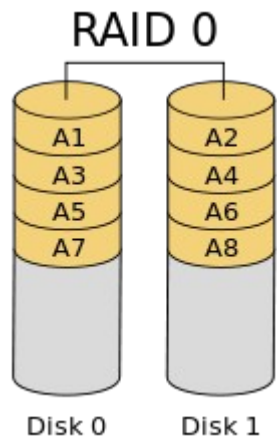
RAID

- Redundant Arrays of Independent Disks
- Distributing data over multiple discs for redundancy / speed / increased capacity
- Raid Controller : software or hardware

RAID modes

RAID Mode	Min Drives	Description	Comments
RAID 0	2	Striping	Speed up
RAID 1	2	Mirroring	Read is n times faster, n-1 drive failures tolerated
RAID 5	3	Block-level striping with distributed parity	1 drive failure tolerated, Read is n times faster, write is n-1 times faster
RAID 6	4	Block-level striping with dual distributed parity	2 drive failures tolerated, read is n times faster, write is n-2 times faster

usable capacity < actual capacity

RAID 0

Disk 0	Disk 1
A1	A2
A3	A4
A5	A6
A7	A8

RAID 5

Disk 0	Disk 1	Disk 2	Disk 3
A1	A2	A3	A_p
B1	B2	B_p	B3
C1	C_p	C2	C3
D_p	D1	D2	D3

RAID 1

Disk 0	Disk 1
A1	A1
A2	A2
A3	A3
A4	A4

RAID 6

Disk 0	Disk 1	Disk 2	Disk 3	Disk 4
A1	A2	A3	A_p	A_q
B1	B2	B_p	B_q	B3
C1	C_p	C_q	C2	C3
D_p	D_q	D1	D2	D3
E_q	E1	E2	E3	E_p

Ref: amazon.com

Images courtesy: Wikipedia