RAID

0 1 2 3 4 5 6 7 8 9 . . .

One strip

Component disks

1 0 3 6 9 . . .

One stripe

2 1 4 7 10 . . .

3 2 5 8 11 . . .

RAID 0

https://res.jens-training.com

RAID

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | . . . | | |

Component disks

1 | 0 | 2 | P | 6 | . . . |

2 | 1 | P | 4 | 7 | . . . |

3 | P | 3 | 5 | P | . . . |
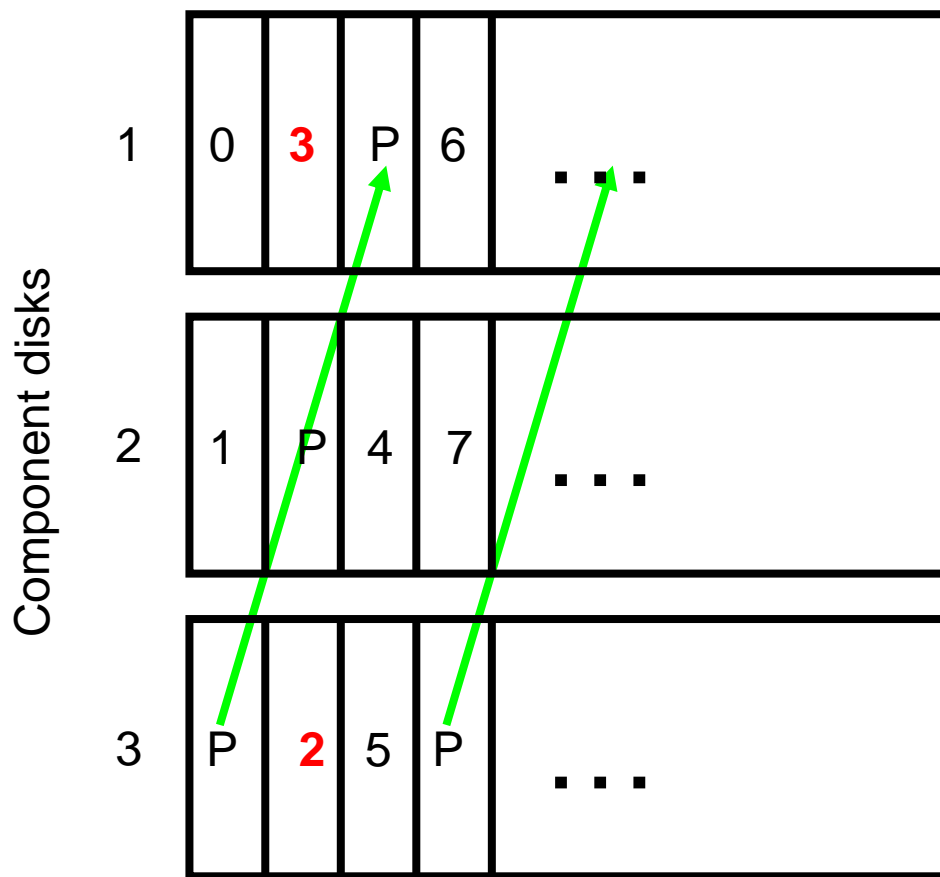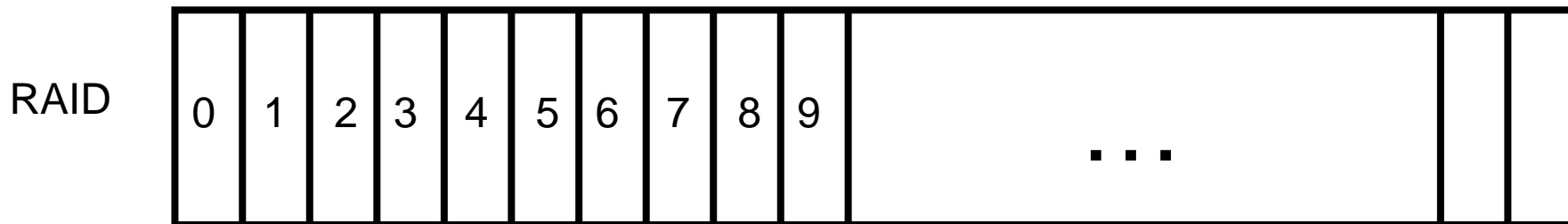
RAID 5

backward parity
aka left asymmetric
(used in Adaptec chip sets)

Notice rotating parity (XOR)
starting at last component, with
lowest strip always on lowest
component.

RAID

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | . . . | | |

Component disks

| 1 | 0 | **3** | P | 6 | . . . |

| 2 | 1 | P | 4 | 7 | . . . |

| 3 | P | **2** | 5 | P | . . . |

RAID 5

backward dynamic parity
aka left symmetric
(used in AMI chip sets)

Notice the change in strip order:
lowest strip always on component
following parity; parity rotation as
before

RAID

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | . . . | | |

Component disks

1 | P | 2 | 4 | P | . . . |

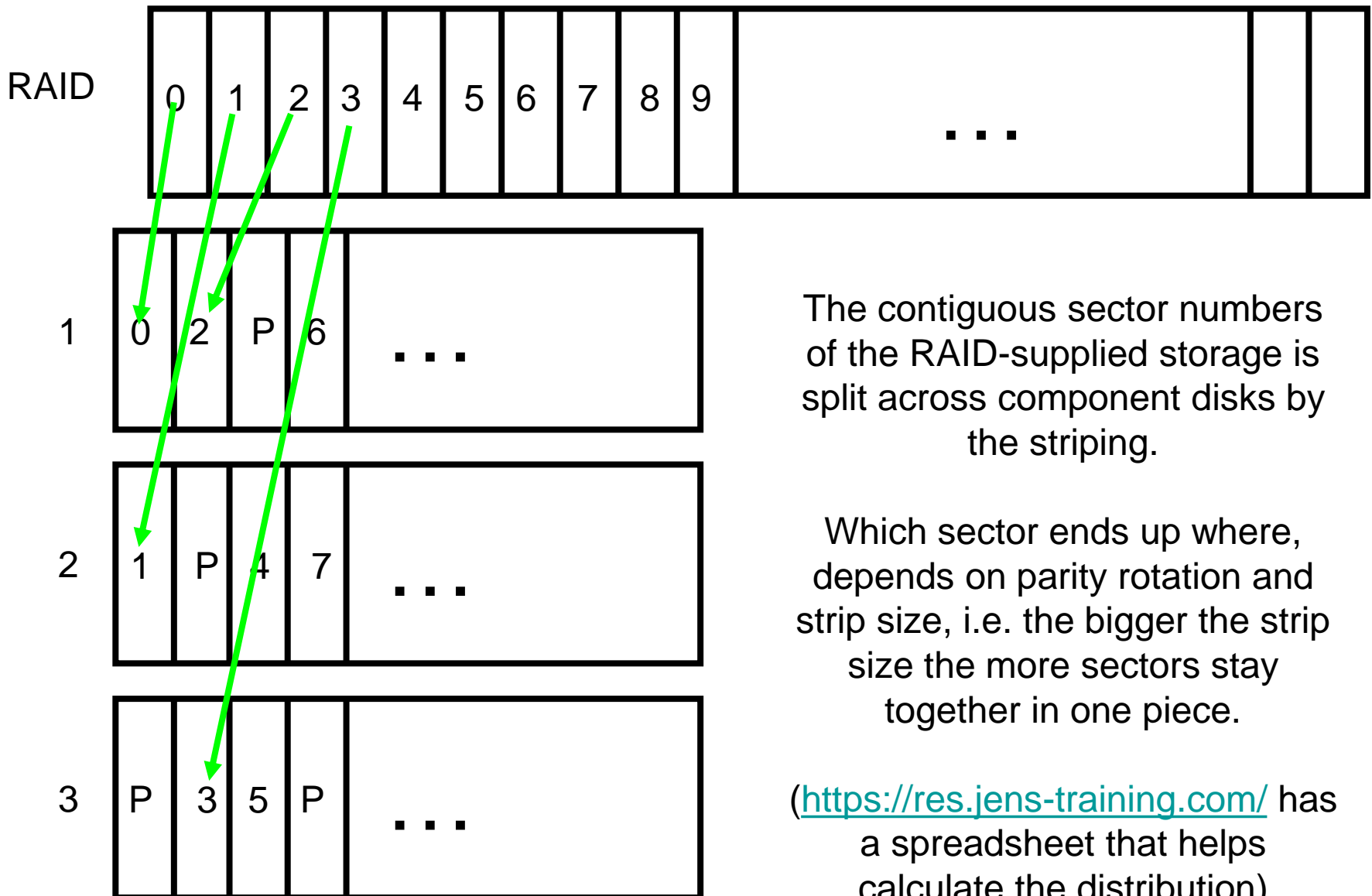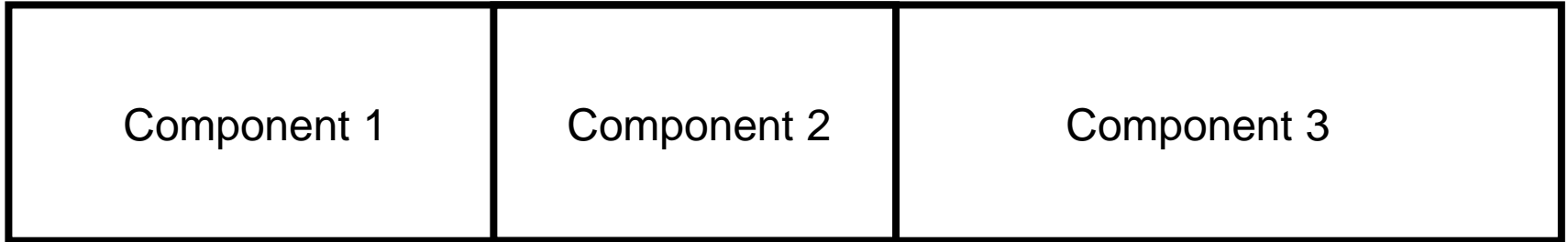2 | 0 | P | 5 | 6 | . . . |

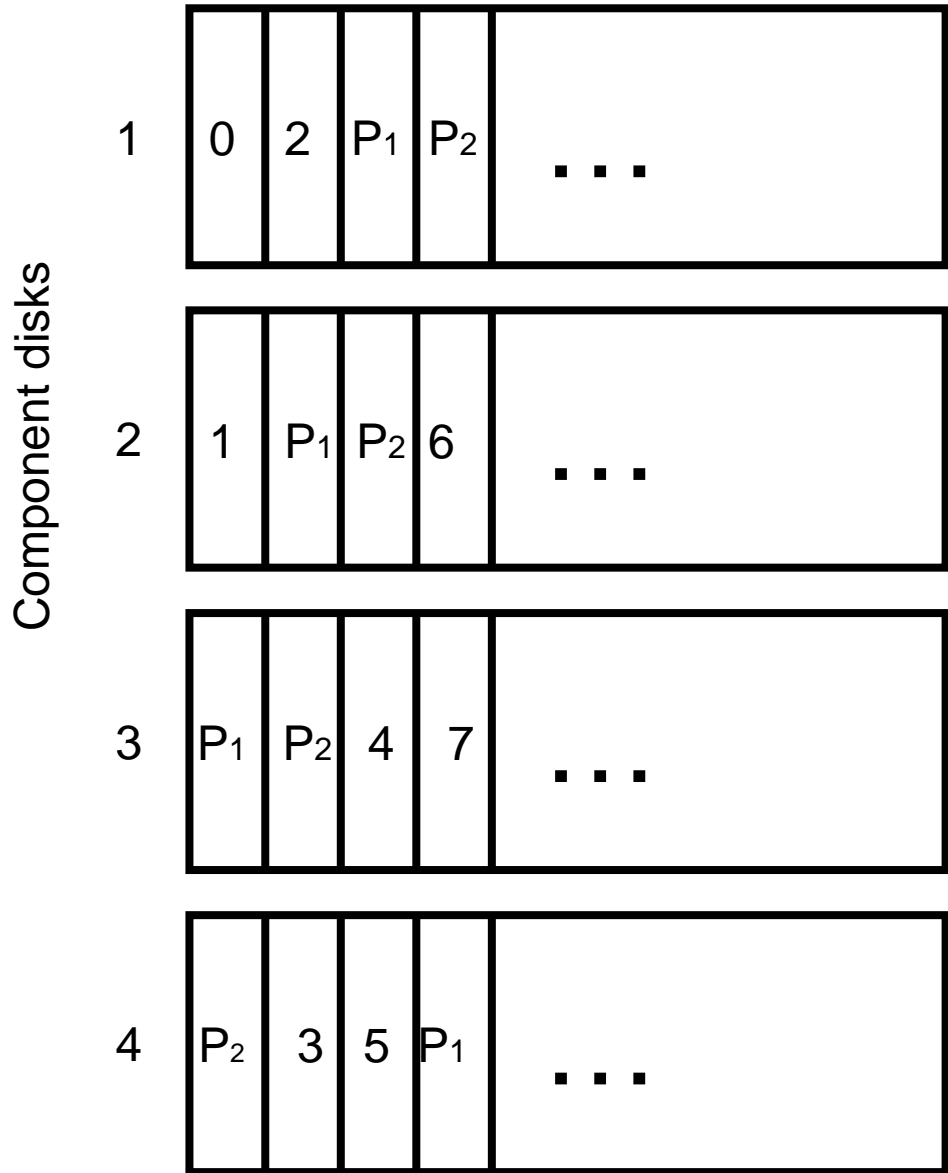3 | 1 | 3 | P | 7 | . . . |
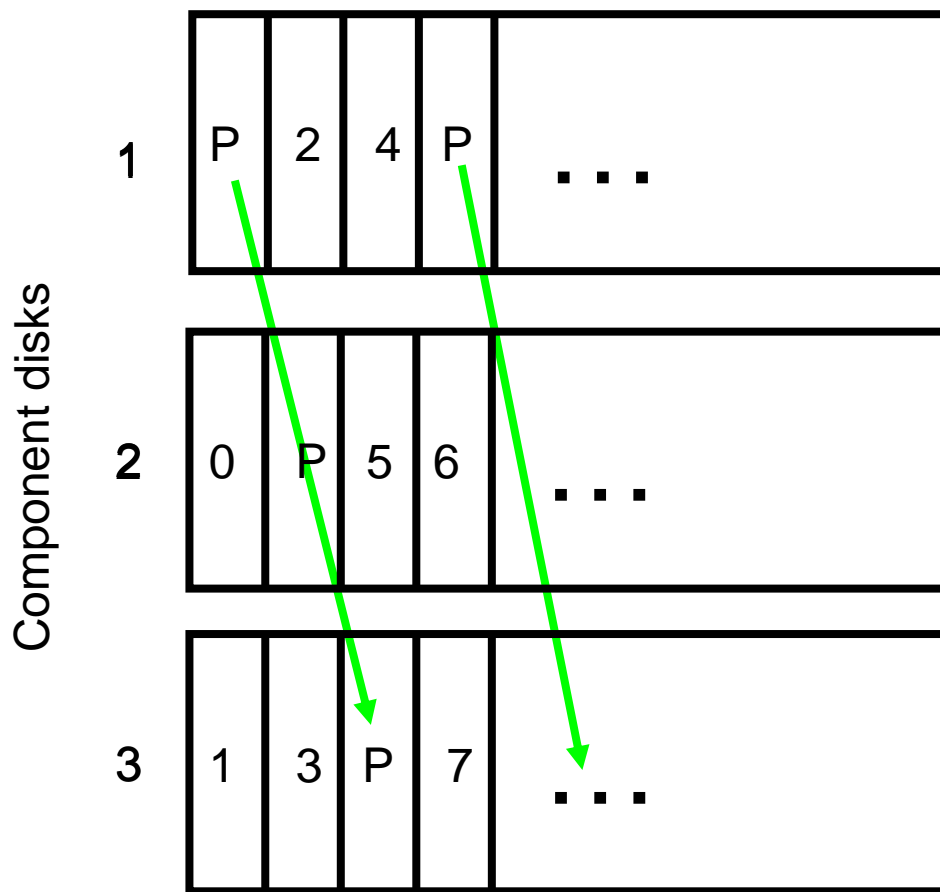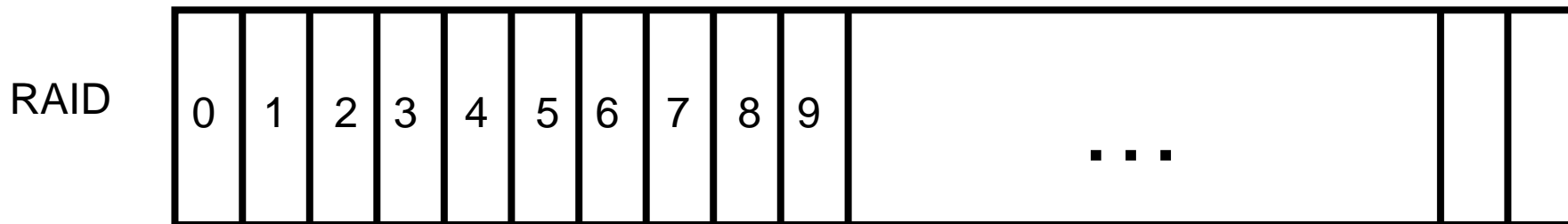
RAID 5

Forward parity reverses rotation

(shown here in non-dynamic, aka right asymmetric arrangement; also comes in dynamic, aka right symmetric)
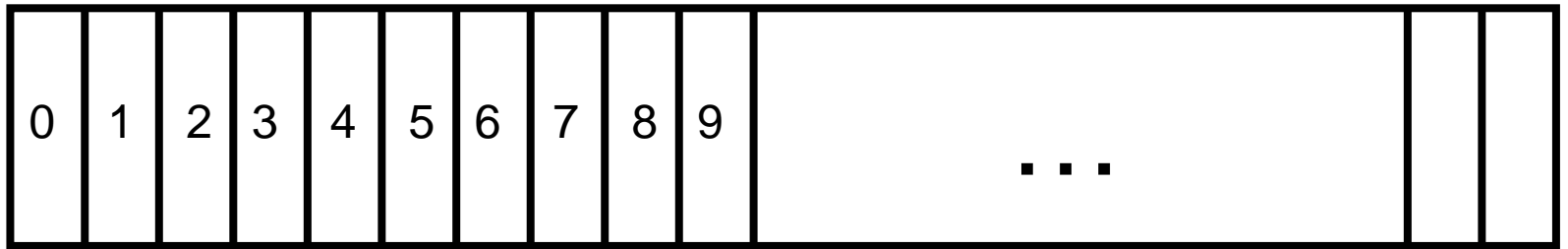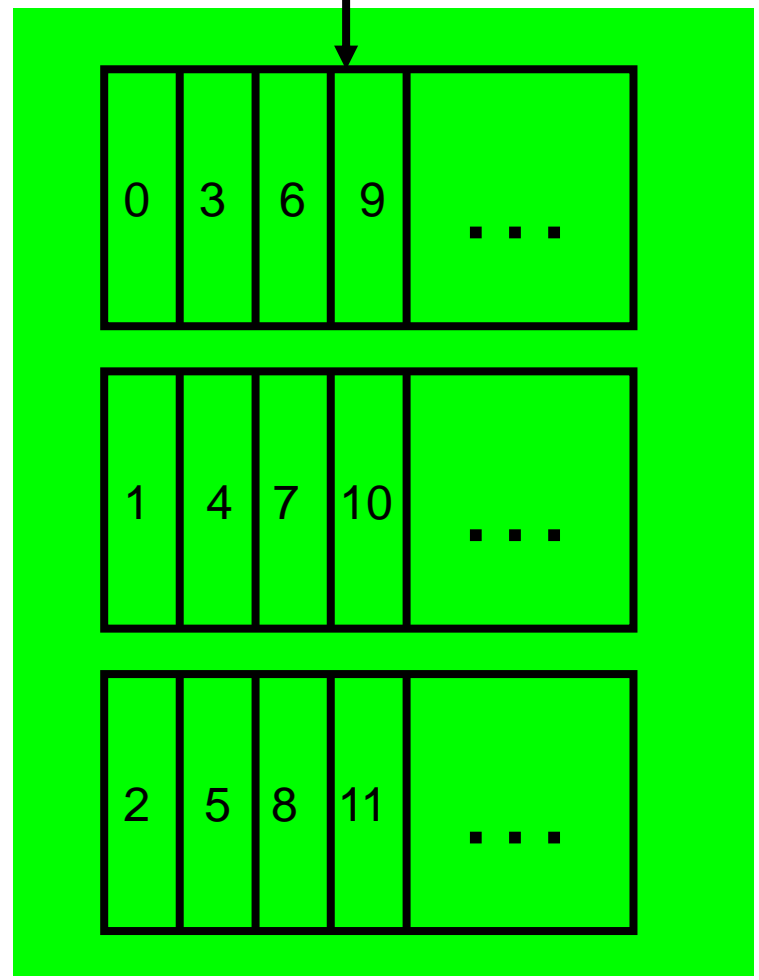
Data positioning

RAID

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | . . . | | |

1 | 0 | 2 | P | 6 | . . . |

2 | 1 | P | 4 | 7 | . . . |

3 | P | 3 | 5 | P | . . . |

The contiguous sector numbers of the RAID-supplied storage is split across component disks by the striping.

Which sector ends up where, depends on parity rotation and strip size, i.e. the bigger the strip size the more sectors stay together in one piece.

(https://res.jens-training.com/ has a spreadsheet that helps calculate the distribution)

| Component 1 | Component 2 | Component 3 |

JBOD

Component disks

1	0	2	P_1	P_2	. . .

2	1	P_1	P_2	6	. . .

3	P_1	P_2	4	7	. . .

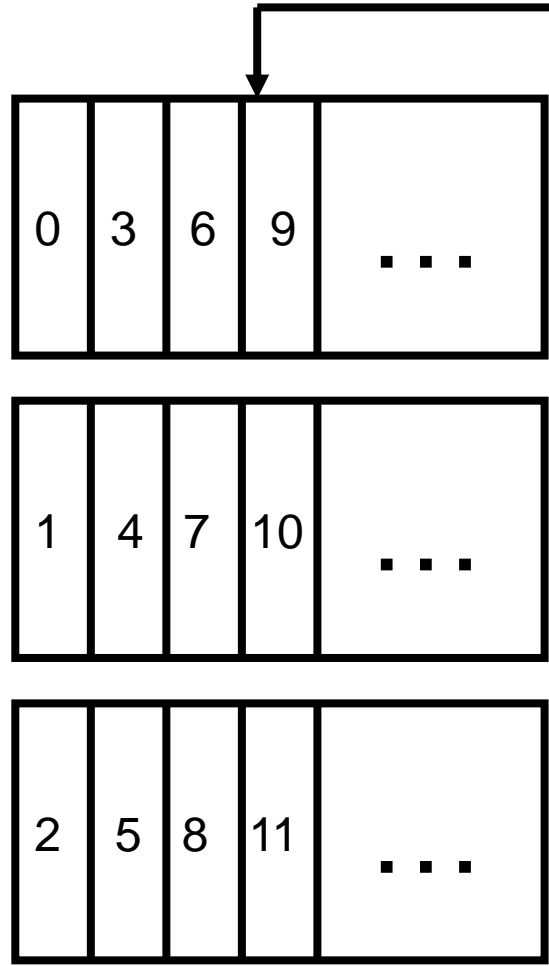|				
4	P_2	3	5	P_1	. . .

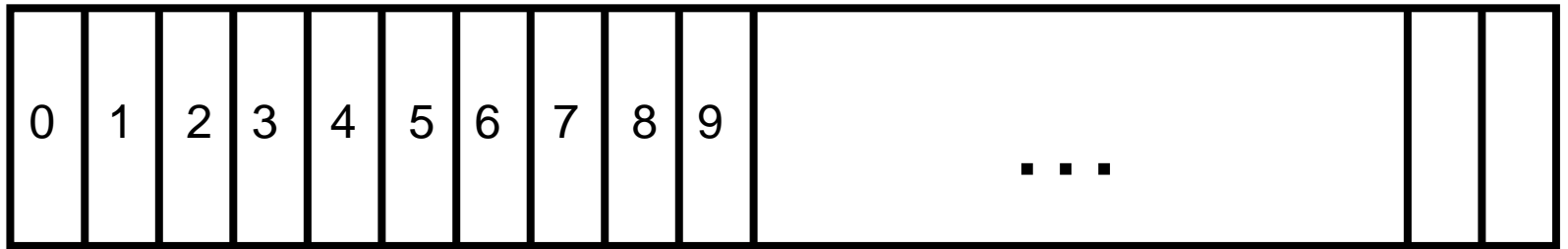# RAID 6

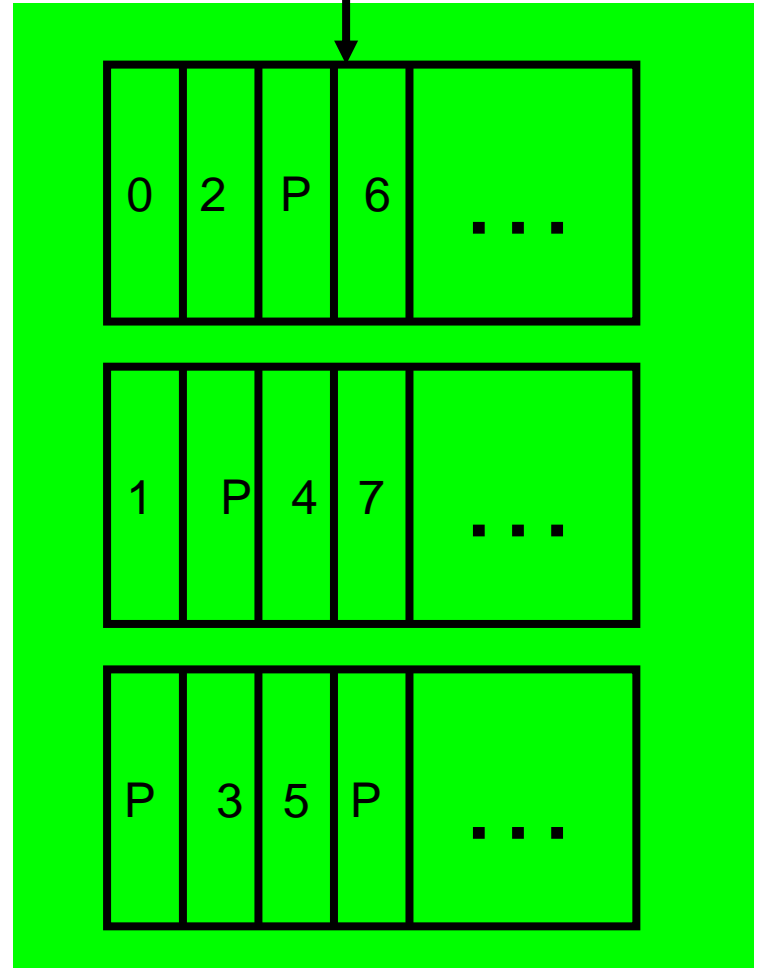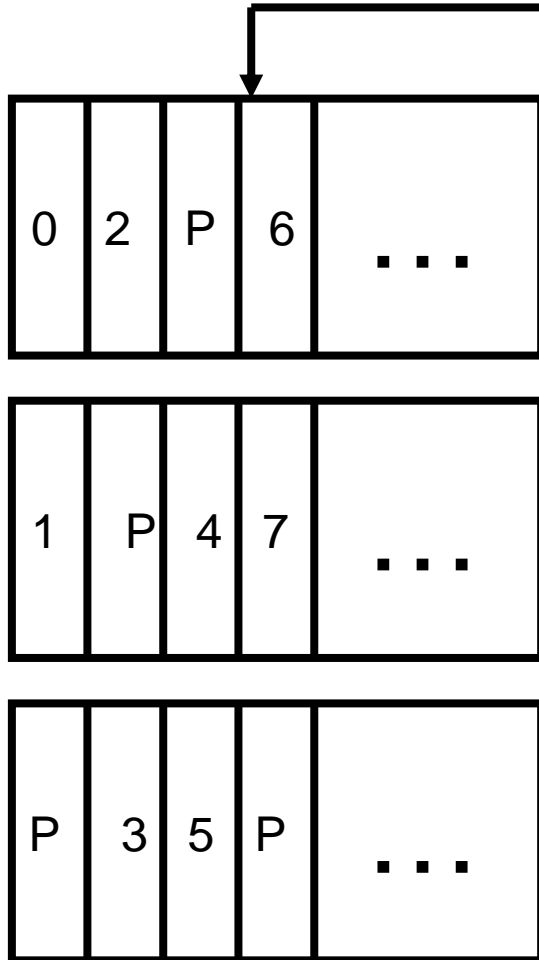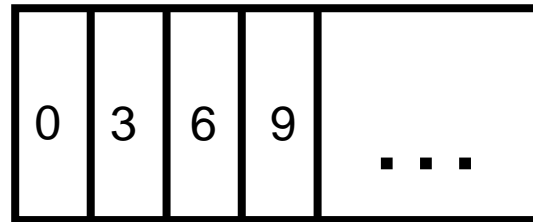(Reed-Solomon for second parity, XOR for first)

RAID

0	1	2	3	4	5	6	7	8	9	. . .		

RAID 10

0	3	6	9	. . .

1	4	7	10	. . .

2	5	8	11	. . .

0	3	6	9	. . .

1	4	7	10	. . .

2	5	8	11	. . .

RAID

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | . . . | | |

RAID 15

| 0 | 2 | P | 6 | . . . |

| 1 | P | 4 | 7 | . . . |

| P | 3 | 5 | P | . . . |

| 0 | 2 | P | 6 | . . . |

| 1 | P | 4 | 7 | . . . |

| P | 3 | 5 | P | . . . |

https://res.jens-training.com

RAID

0	3	6	9	. . .

Ordinary RAID components
are whole disks

1	4	7	10	. . .

2	5	8	11	. . .

Linux MD RAID

0 3 6 9 . . .
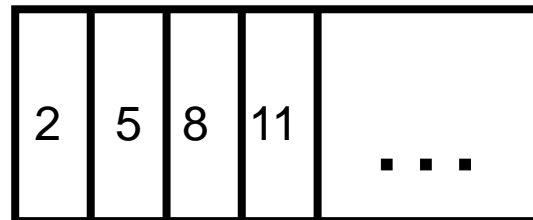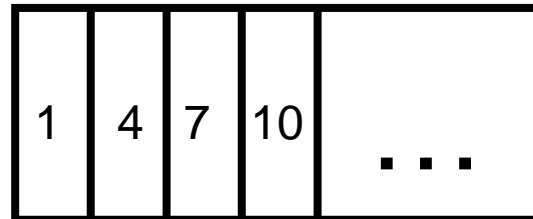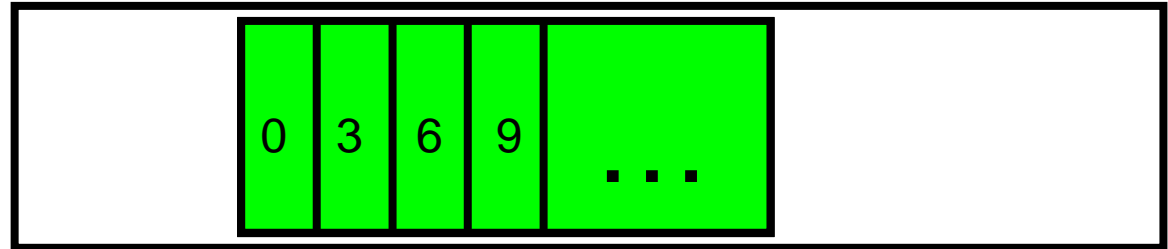
Linux MD RAID components
are individual partitions

1 4 7 10 . . .

2 5 8 11 . . .

https://res.jens-training.com

Linux MD RAID

0 3 6 9 . . .
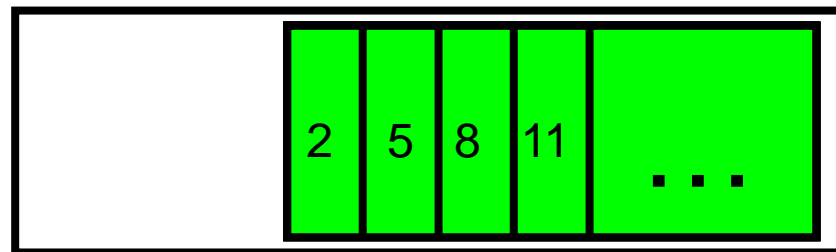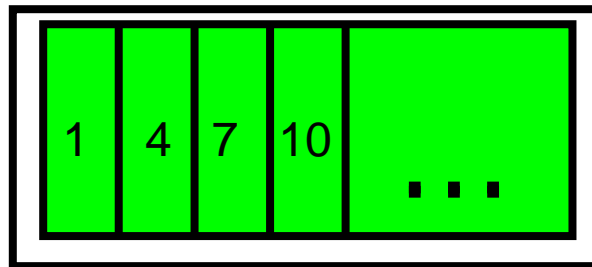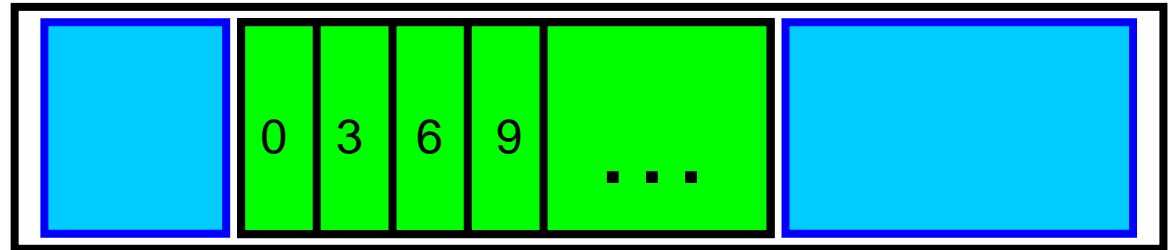
Any leftover space on the disks can be used for other, unrelated partitions

1 4 7 10 . . .

2 5 8 11 . . .

Linux MD RAID

0	3	6	9

...

1	4	7	10

...

MD RAID Headers
containing the configuration
precede the actual MD RAID
component partitions

2	5	8	11

...