

RAID 3 - Parallel Array with Parity

RAID 3 - Byte level striping, parity on check disk

Spread data by striping: byte1 -> disk1, byte2 -> disk2, byte3 -> disk3

Reads and writes of stripe's bytes happen at the same time!

Transfer rate = $(N - 1) * \text{transfer rate of one disk}$

Only partial redundancy!

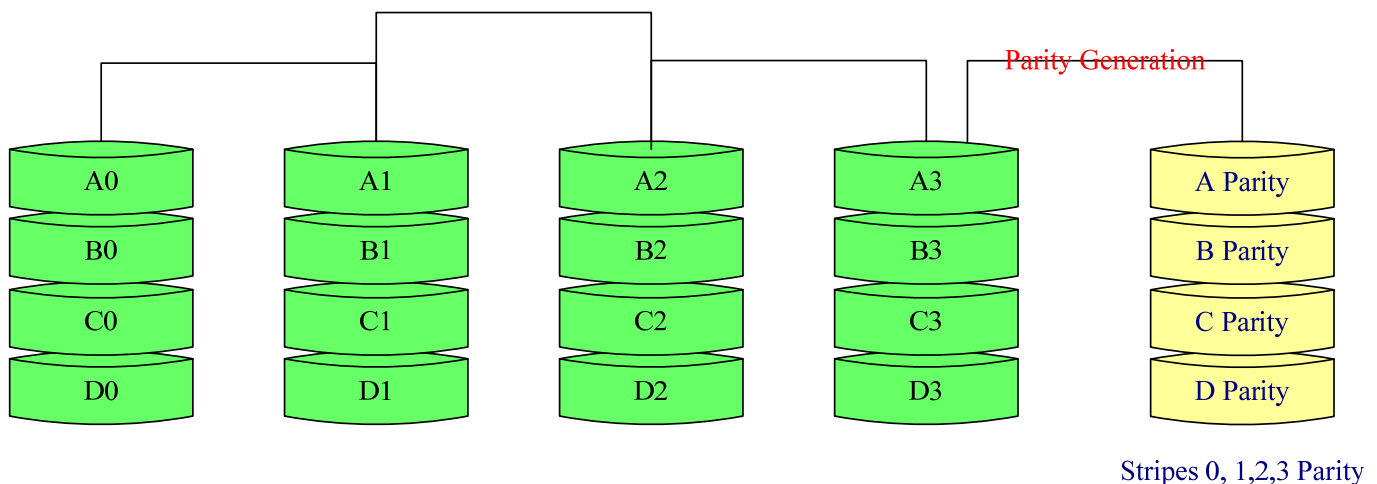
Check disk stores parity information

Parity overhead amounts to one bit per group of corresponding bits in a stripe

Redundancy overhead = $1 / N \%$

- Oops! Byte striping means every disk involved in every request!
- No parallel reads nor writes
- Fast read/write
- All disk arms are synchronized
- Speed is limited by the slowest disk

RAID Level 3: Parallel Transfer with Parity



Parity Check - Classical

- An extra bit added to a byte to detect errors in storage or transmission
- Even (odd) parity means that the parity bit is set so that there are an even (odd) number of one bits in the word, including the parity bit
- A single parity bit can only detect single bit errors since if an even number of bits are wrong then the parity bit will not change
- It is not possible to tell which bit is wrong