

Buddy Memory Allocation Cheatsheet

■ What is Buddy Memory Allocation?

A memory management algorithm that splits/merges memory blocks into power-of-2 sizes to optimize allocations.

■■ How It Works

- 1. Start with a single block (e.g., 1024KB)
- 2. Split into halves until smallest fitting block is found
- 3. Allocate the block
- 4. Merge freed blocks with their buddies

■ Pros

- Fast allocation/deallocation
- Efficient merging
- Prevents external fragmentation

■ Cons

- Internal fragmentation
- Power-of-2 size constraint
- Memory overhead for splitting

■ Key Formula

Buddy Address = Block Address XOR Block Size

■ Memory Block Splitting Example

1. 1024KB 2. ■■■ 512KB (Allocated) 3. ■■■ 512KB 4. ■■■ 256KB (Free) 5. ■■■ 256KB (Free)