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CS 4520 Operating Systems – Jim Ries

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Filesystem Design

Given:

Total number of blocks = 2^{16} = 65536

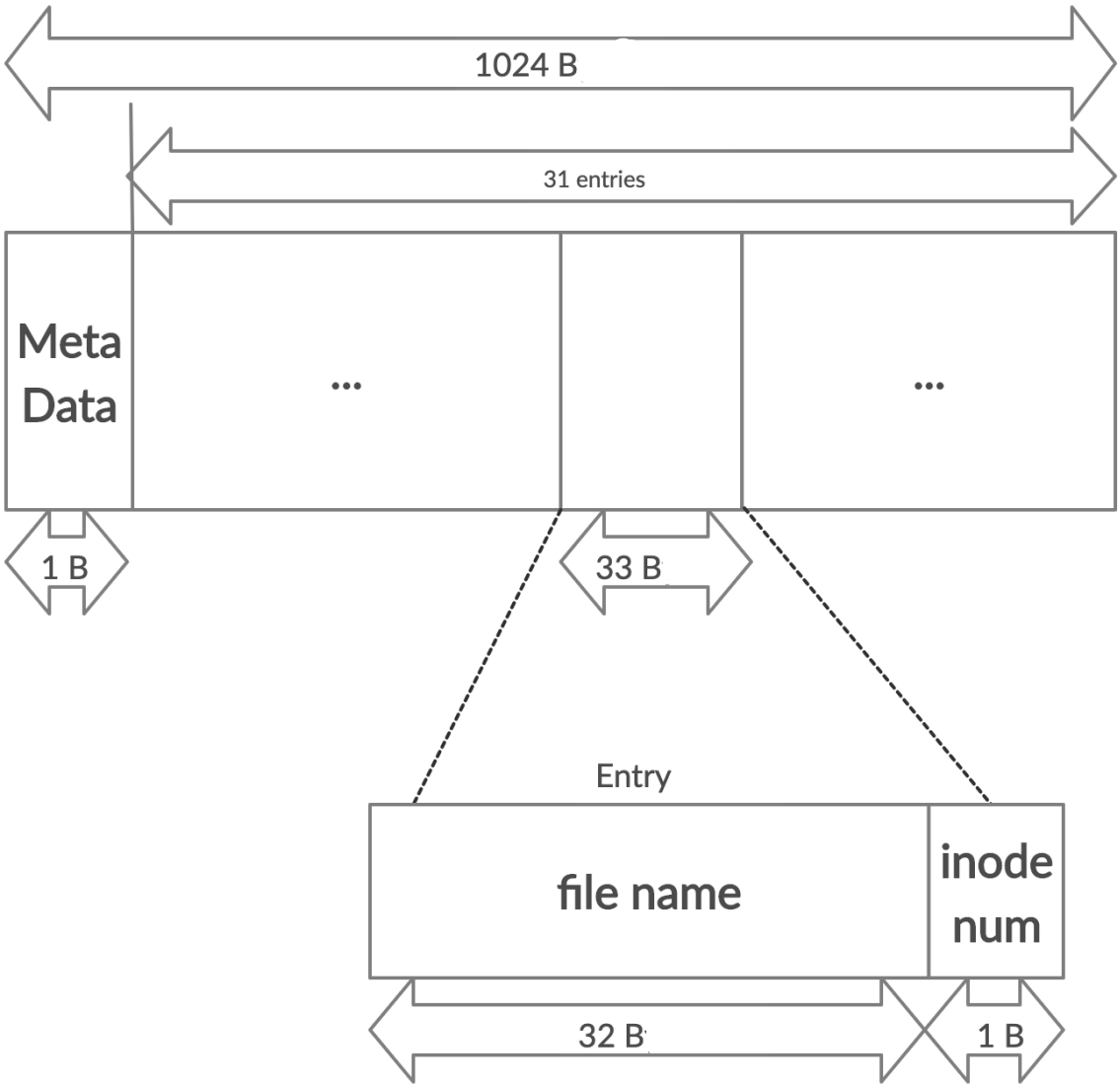
Size of blocks = 4096 = 2^{12}

- Meta Data = 17 blocks
- block map = 2^{16} = 2^{16} / 2^3 = 8192 → 8 blocks
- inode table = 16 blocks
    - inode size = 64 Byte
    - inode num = 16 blocks x 1024 Byte / 64 Byte = 256
- inode bitmap = 256 bit = (256 / 8) = 32 Byte → 1 block
- Free blocks = 2^{16} – 17 (meta data) – 8 (block map) – 16 (inode table) – 1 (inode bitmap) = 65494 blocks

Max file size = 6 x 1024 Byte + 1 x 512 x 1024 Byte + 1 + 512 x 512 x 1024 Byte = 2.69 × 10^8 bytes = 269 MB = 256.5 MiB

File System:

Directory File Block:



File representation: