Direct Mapped Cache

Cache Parameters

Memory Size	8 MB
Cache Size	64 KB
Block Size	2 B

Cache Parameters

Step 1 - Calculate total bits required

Main Memory Size		
8 MB	8,192 KB	8,388,608 B

8,388,608 = 1000 0000 0000 0000 0000 0000b = 2^{23}

8,388,608 - 1 = 8,388,607

111 1111 1111 1111 1111 1111b (23 bits)

Cache Address Structure

Tag	
Index	
Offset	

Cache Parameters

Step 1 - Calculate total bits required

Step 2 - Calculate Offset

Block Size
2 B

2 = 10b

2 - 1 = 1d = 1b

1 bit required (1 or 0)

Cache Address Structure

Offset
1

Tag	
Index	
Offset	1 bit

Cache Parameters

Step 1 - Calculate total bits required

Step 2 - Calculate Offset

Step 3 - Calculate blocks in cache

Cache Size	Block Size
64 KB	2 B

64 KB = 65,536 B

65,536 B / 2 B = 32,768 B

32,768 - 1 = 32,767

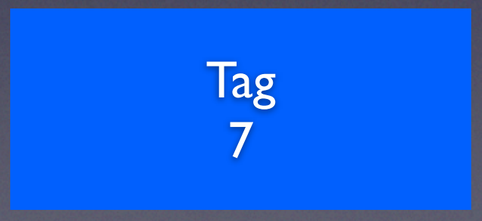
32,767 = 111 1111 1111 1111b (15 bits)

Cache Address Structure

Index
15

Tag	
Index	15 bits
Offset	1 bit

Cache Address Structure



Tag	7 bits
Index	15 bits
Offset	1 bit