

This arrangement allows for contiguous blocks to be in cache at same time, but does not allow for arbitrary combinations of blocks in cache at same time. (Examples of tag values for various contiguous blocks should be given: 0,1,2,3 + 2,3,4,5)

Decimal Addr	Tag	Tag	Tag	Set	Set		Offset	Direct	+ Mas
0	0	Q	0	0	0	0	0	Direct O	Evay
1	0	0	0	0	0	0	1	Block O	THE REAL PROPERTY.
2	0	0	0	0	0	1	0	.0	
3	0	0	0	0	0	1	1:		
4	0	0	0	0	1	0	0		
5	0	0	0	0	1	0	1	Block	
6	0	0	0	0	1	1	0	_(	
7	0	0	0	0	1	1	1 /		
8	0	0	0	1	0	0	0 '		
9	0	0	0	1	0	0	1 .	Block 2	
10	0	0	0	1	0	1	0		
11	0	0	0	1	0	1	1	/	
12	0	0	0	1	1	0	0		
13	0	0	0	1	1	0	1	Block 3	
14	0	0	0	1	1	1	0.		
15	0	0	0	1	1	1	1		
16	0	0	1	0	0	0	0		
17	0	0	1	0	0	0	1	Block 4	
18	0	0	1	0	Ò	1	0		
19	0	0	1	0	0	1	1 )		
20	0	0	1	0	1	0	0		
21	0	0	-1	0	1	0	1	Block 5	
22	0	0	1	0	1	1	0		
23	0	0	1	0	1	1	1 /		
24	0	0	1	1	0	0	0		
25	0	0	1	1	0	0	1 }	Blockb	
26	0	0	1	1	0	1	0		
27	0	0	1	1	0	1	1 /		
28	0	0	1	1	1	0	0		
29	0	0	1	1	1	0	1	· Block 7	
30	0	0	1	1	1	1	0		
31	0	0	1	1	1	1	1		
32	0	1	0	0	0	0	0	)	
33	0	1	0	0	0	0	1	Block 8	
34	0	1	0	0	0	1	0		
35	0	1	0	0	0	1	1		
36	0	1	0	0	1	0	0	Block 9	
37	0	1	0	0	1	0	1		

A TOUCH THE

(a varient w/ 3 set bits+ Freet-Mapped 2 tag bits) Example B

7 bit addresses = 2 = 127 bytes of addressable memory

4 byte blocks Mean 2 bits for block offset and 32 blocks of addressable memory

3 bits for set mean 23 = 8 lines of cache

leaves 2 bits for tag - meaning that one block from each of 22 = 4 quadrants of memory can be cached at a time.

0, 8, 16, 24, seto: Blocks 1, 9, 17, 25 Blocks 2,11,18,26 set 2: Blocks 3,12/19,27 Set 3: Blocks 4, 13, 20, 28 Slt 4: Blocks 5, 14, 21, 29 Sit T: Blocks 6, 15, 22, 30 Set 6: Blocks 7, 16,23,31 Blocks 0 1 2 3 cache: Tags Values:

4 byte blocks

tag 5e t 000 001 010 011 100 101 110 111

		P 10	4				Direct-Mapped			
Decimal Addr	Tag	Tag	Set-	Set	Set	Offset	Offset	Direct-Magped Example B		
0	0	0	0	0	0	0	0			
1	0	0	0	0	0	0	1	Block O		
2	0	0	0	0	0	1	0	191001		
3	0	0	0	0	0	1	1			
4	0	0	0	0	1	0	0			
5	0	0	0	0	1 /	0	1	Block		
6	0	0	0	0	1.	1	0			
7	0	0	0	0	1	1	1			
8	0	0	0	1	0	<u> </u>	0	)		
9	0	0	0	1	0	0	1	Block 2		
10	0	0	0	1	0	1	0			
11	0	0	0	1	0	1	1 ,	)		
12	0	0	o	1	1	0	0			
13	0	0	0	1	1	0	1	Block 3		
14	0	0	0	1	1	1	0	131000		
15	0	0	0	1	1	1	1	)		
16	0	0	1	0	0	0	0			
17	0	0	1	0	0	0	1	Block 4		
18	0	0	1	0	0	1	0	Dice		
19	0	0	1	0	0	1	1			
20	0	0	1	0	1	0	0	)		
21	0	0	1	0	1	0	1 /	Block 5		
22	0	0	1	0	1	1	0	7,104-3		
23	0	0	1	0	1	1	1 )			
24	0	0	1	1	0	0	0			
25	0	0	1	1	0	0	1 /	Block b		
26	0	0	1	1	0	1	0	DI BOIL		
27	0	0	1	1	0	1	1 /			
28	0	0	1	1	1	0	0			
29	0	0	1	1	1	0	1	Block 7		
30	0	0	1	1	1	1	0	BION 1		
31	0	0	1	1	1	1	1			
32	0	1	0	0	0	0	0			
33	0	1	0	0	0	0	1 /	Block 8		
34	0	1	0	0	0	1	0	VØ 1 ~		
35	0	1	0	0	0	1	1			
36	0	1	0	0	1 /	0	0	A 1 - 11 0		
37	0	1	0	0	1.	0	1	Block 9		
!								,		

Set-Associative

	E	XA	mpc	-5	, =	2-way	26	r- assor	ciativo Foot		Block	Treser
set	D	V	garateturist	ta	G Santanananananananananananananananananan	00		01	10		11	
0 0		1	0	1	0.0			X	1			1
		1	0	0	Junia market	etinen en		ON THE WAY THE PROPERTY OF THE PARTY OF THE	ar and a state of the state of			erGesseyats Deby 6.
0 11		1	0	0	111		100		THE STATE OF THE S	MANAGE AND ASSESSED	The color bearings as the color of the color	oncommon and a
Cathodra Control of the		10	1			entre de la company de la comp		THE KINDS TO SELECT TO SELECT ON THE SERVICE SHAPE	Color State of Party State of	-	PARTHAUNTURY FINISH PROMPE THEOLOGIC	emeconius and
0		1	0	0			Marie Marie Marie State (1994)		- Commence	SAN PROPERTY AND ADDRESS AND A		-
	No.	1	0	0	0		A TAX SAN AND A STREET, SAN AS A STREET,	EIONIPHINAMONNET KALINININI ISES	AND THE PARTY OF THE CONTROL OF THE	PARTICIPATION OF THE PROPERTY OF THE PARTY O		
1 1		1	0	0			Charles and Charles and	BORGERY BEEN STORY OF THE STORY		THE PERSON NAMED IN COLUMN TWO		
	1	1	0	0	0	的企业。在1964年,	Section 19 of the Section Asset		TO THE STREET WAS ARRESTED TO STREET WITH SHOW	CHICAGO POR POR CHICAGO POR	CONTRACTOR	of entrance and

01000 01 tag set offset yes! lookup: yes! ooll 11 11 tag set offset lookup: tog set offset lookup: M155! So bring in to empty line + Set valid bit tog set offset MISS So, must replace one of the set oo lines

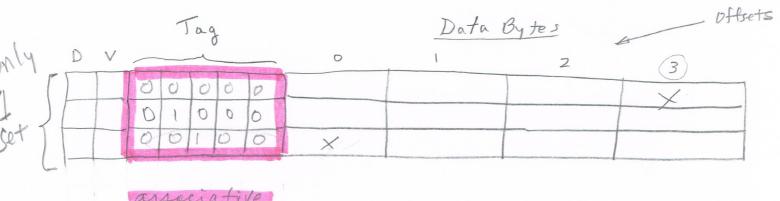
ecimal Addr	Tag	Tag	Tag	Set	Set	Offset	Offset	0 1
0	0	0	0	0	0	0	0	Set
1	0	0	0	0	0	0	1	Block
2	0	0	0	0	0	1	0	Block
3	0	0	0	0	0	1	1 )	
4	0	0	0	0	1	0	0	)
5	0	0	0	0	1	0	1	
6	0	0	0	0	1	1	0	( Block
7	0	0	0	0	17	1	1 /	)
8	0	0	0	d	0	0	0	
9	0	0	0	1	0	0	1 (	Block
10	0	0	0	(1	0	1	0 (	BINER
11	0	0	0	1	0	1	1 )	
12	0	0	0	1	1	0	0	
13	0	0	0	1	1	0	1	· Block
14	0	0	0	1	1	1	0	BIOCK
15	0	0	0	1	1	1	1	
16	0	0	1	0	0	0	0	A Title on
17	0	0	1	0	0	0	1	Block
18	0	0	1	0	0	1	0	6166
19	0	0	1	0	0	1	1 )	
20	0	0	1	0	1	0	0	
21	0	0	1	0	1	0	1	Block
22	0	0	1	0	1	1	0	
23	0	0	1	0	1	1	1	
24	0	0	1	1	0	0	0	
25	0	0	1	1	0	0	1 (	Block
26	0	0	1	1	0	1	0	St. S. C. C.
27	0	0	1	1	0	1	1 >	
28	0	0	1	1	1	0	0	
29	0	0	1	1	1	0	1	Block
30	0	0	1	1	1	1	0	DIDCK
31	0	0	1	1	1	1	1	
32	0	1	0	0	0	0	0	
33	0	1	0	0	0	0	1	21.
34	0	1	0 .	0	0	1	0	Block g
35	0	1	0	0	0	1	1	
36	0	1	0	0	1	0	0	Block &
37	0	1	0	o	1	0	1	HOCK

Set-Assiciative

## Fully Associative Cache

- o only I set so no bits in address for set
- · see Fully Associative Address Table
- · tag = block #, so no restriction on simultaneous blocks Cache: can be any size + there are only cache

  Offset + tag bits in address.



associative:

> 100Kmp: 00000 (1)

10 gkup: 000 10 @ offset 1

Cache miss! Which to replace?

Was not a question

WI Direct Mapped.

See 36-5

				Tag	Tag			01/22/2017
Decimal Addr	Tag	Tag	Tag	Set	Set	Offset	Offset	Ell La ville
0	0	0	0	0	0	0	0	Fully Associative
1	0	0	0	0	0	0	1	& Block o
2	0	0	0	0	0	1	0	Block o
3	0	0	0	0	0	1	1	
4	0	0	0	0	1	0	0	
5	0	0	0	0	1	0	1	
6	0	0	0	0	1	1	0	Block 1
7	0	0	0	0	1	1	1	
8	0	0	0	1	0	0	0	
9	0	0	0	1	0	0	1	101
10	0	0	0	1	0	1	0	Block 2
11	0	0	0	1	0	1,	1	
12	0	0	0	1	1	0	0	
13	0	0	0	1	1	0	1	
14	0	0	0	1	1	1	0	Block 3
15	0	0	0	1	1	1	1	)
16	0	0	1	0	0	0	0	
17	0	0	1	0	0	0	1	Block 4
18	0	0	1	0	0	1	0	Block 1
19	0	0	1	0	0	1	1	
20	0	0	1	0	1	0	0	
21	0	0	1	0	1	0	1	01 105
22	0	0	1	0	1	1	0	Block 5
23	0	0	1	0	1	1	1	
24	0	0	1	1	0	0	0	
25	0	0	1	1	0	0	1	& Block 6
26	0	0	1	1	0	1	0	
27	0	0	1	1	0	1	1	/
28	0	0	1	1	1	0	0	
29	0	0	1	1	1	0	1	Block?
30	0	0	1	1	1	1	0	V
31	0	0	1	1	1	1	1	)
32	0	1	0	0	0	0	0	
33	0	1	0	0	0	0	1	6 Block 8
34	0	1	0	0	0	1	0	1 of the
35	0	1	0	0	0	1	1	)
36	0	1	0	0	1	0	0	Black 9
37	0	1	0	0	1	0	1	A form
'								