Cache Mapping (1C)

Please send corrections (or suggestions) to youngwlim@hotmail.com.

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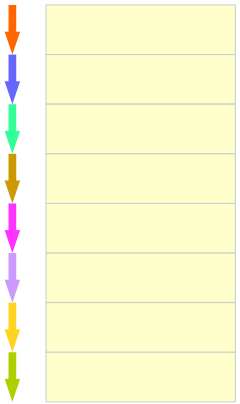
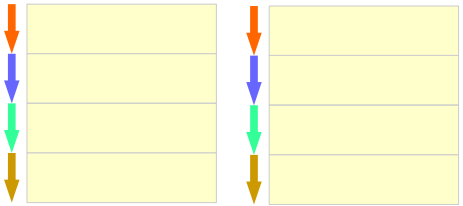
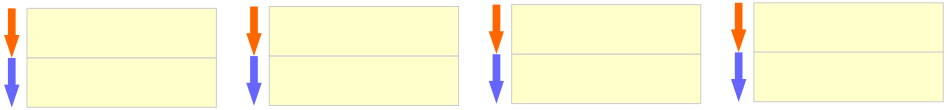
Cache Organization



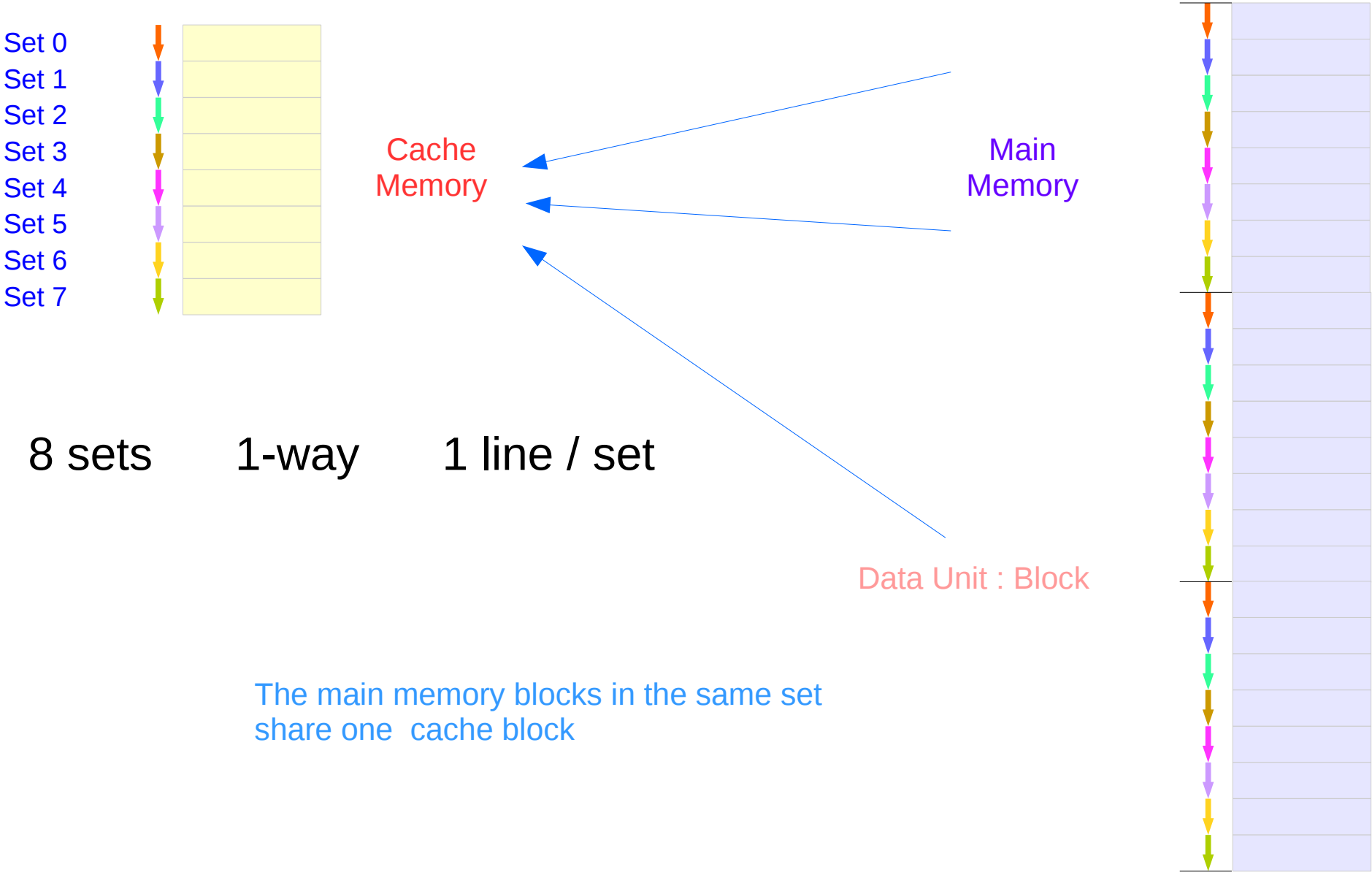
8 sets	1-way	1 line / set
4 sets	2-way	2 lines / set
2 sets	4-way	4 lines / set
1 set	8-way	8 lines / set



Data Unit : Block



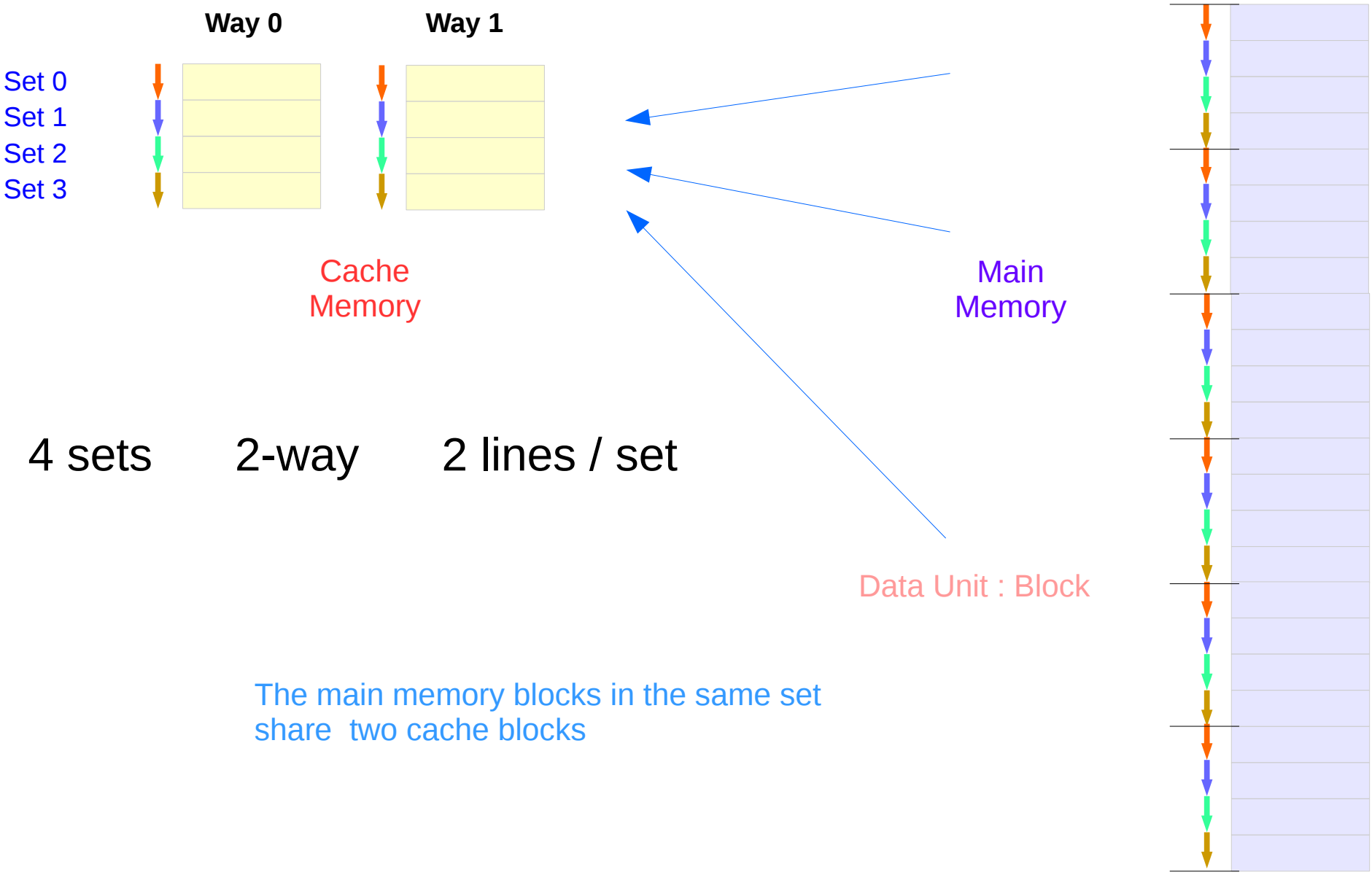
Direct Mapping



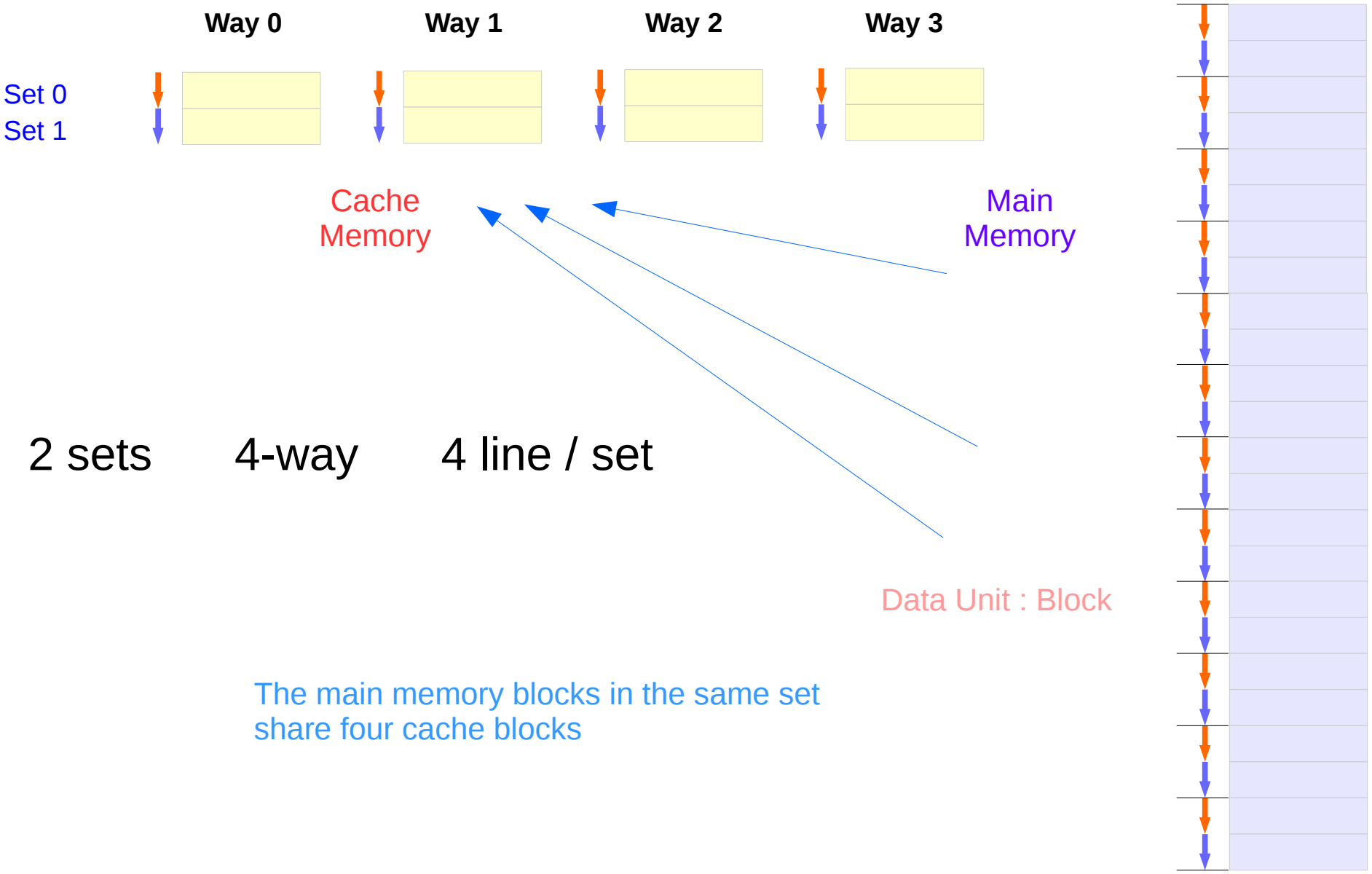
8 sets 1-way 1 line / set

The main memory blocks in the same set share one cache block

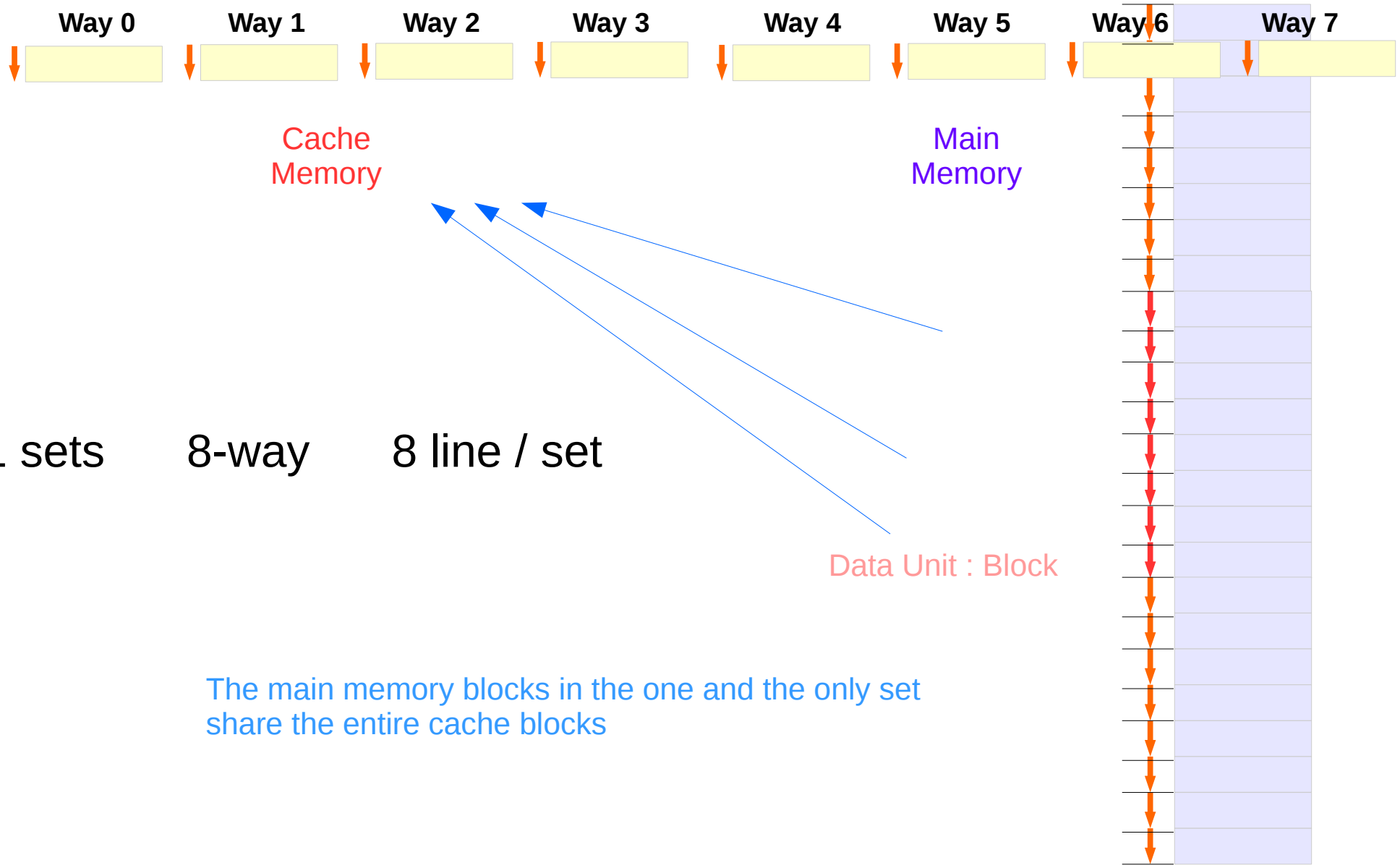
2-Way Set Associative Mapping



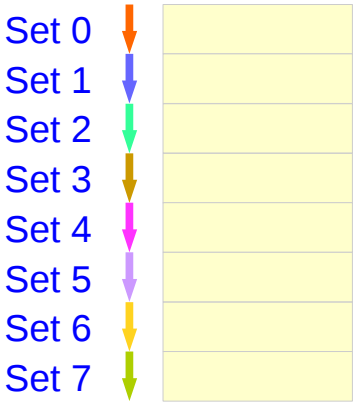
4-way Set Associative Mapping

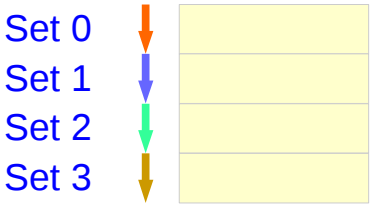


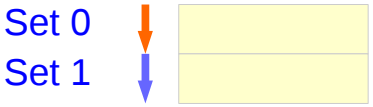
Fully Associative Mapping

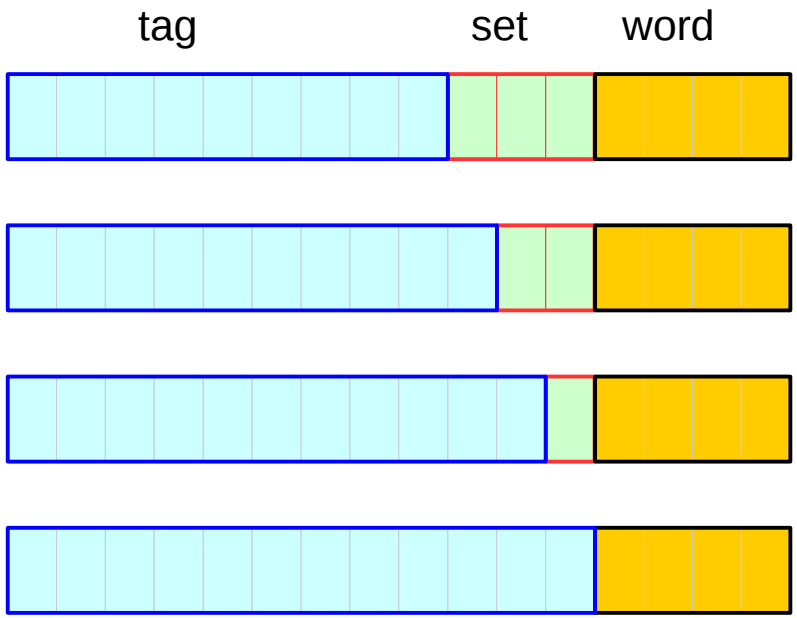


Tag Field



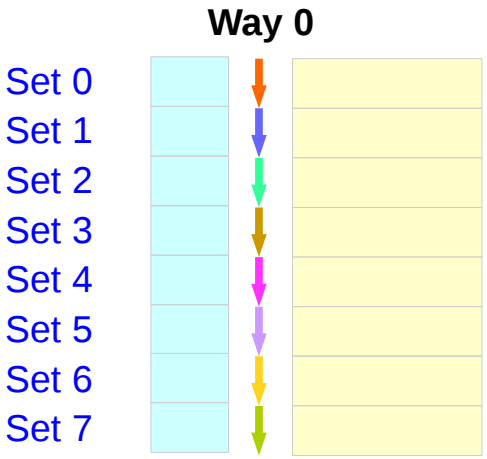






8 sets	1-way	1 line / set
4 sets	2-way	2 lines / set
2 sets	4-way	4 lines / set
1 set	8-way	8 lines / set

Cache Mapping Method (set-view)



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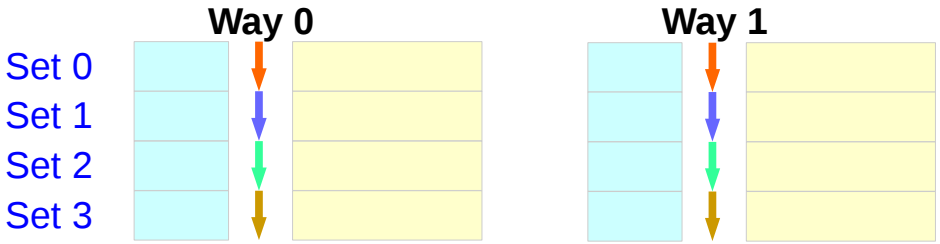
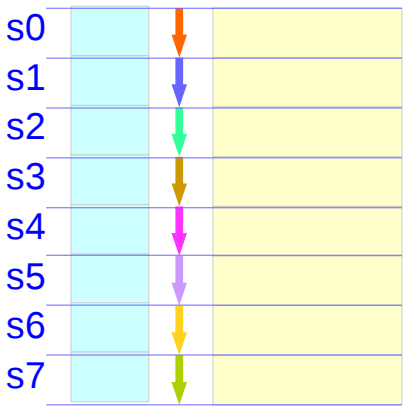
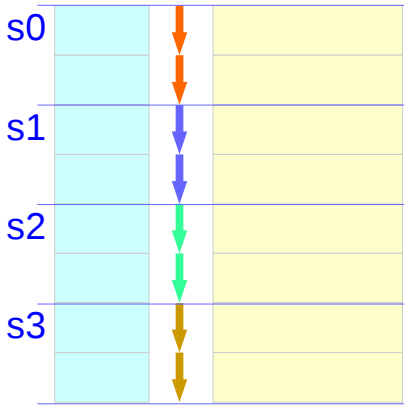
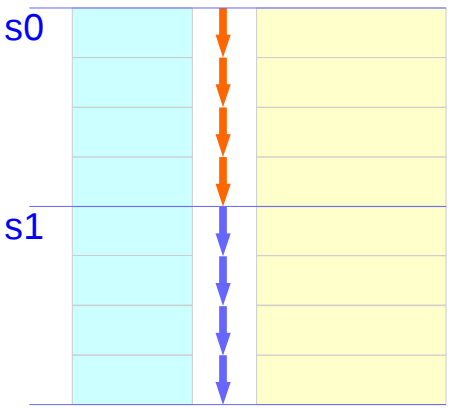
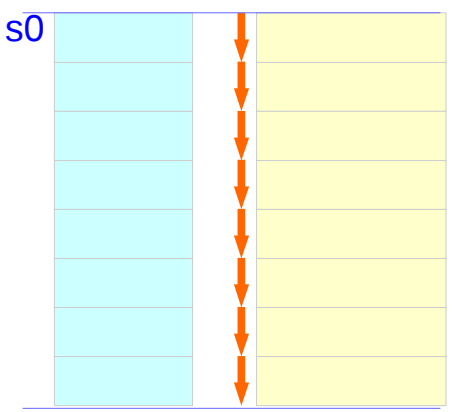


Cache Mapping Method (set-view)









8 sets	1-way	1 line / set
4 sets	2-way	2 lines / set
2 sets	4-way	4 lines / set
1 set	8-way	8 lines / set

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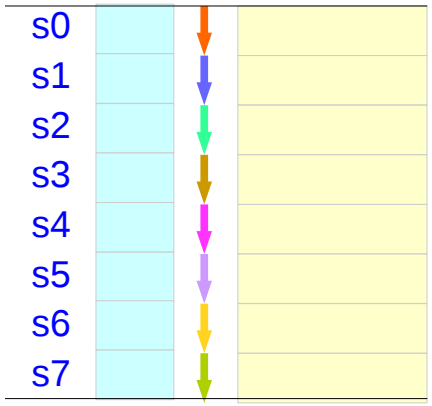
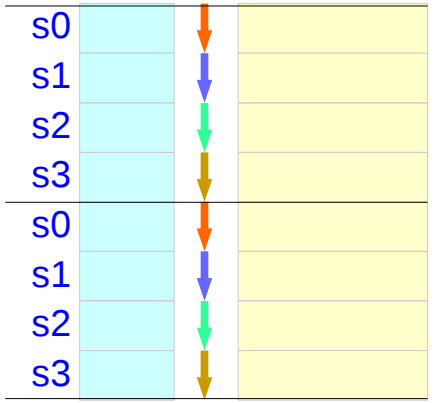
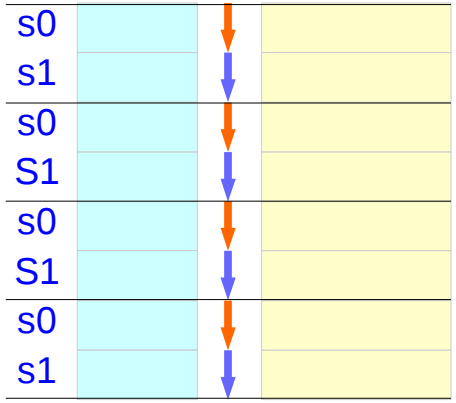
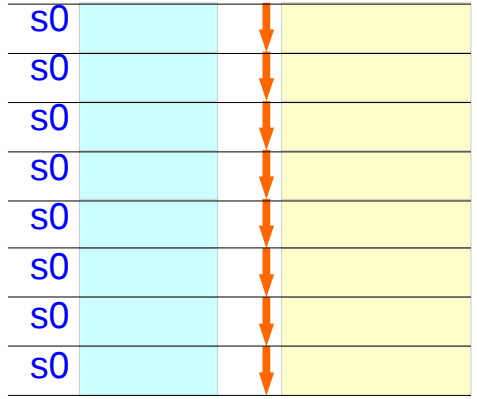
Cache Mapping Method (way-view)









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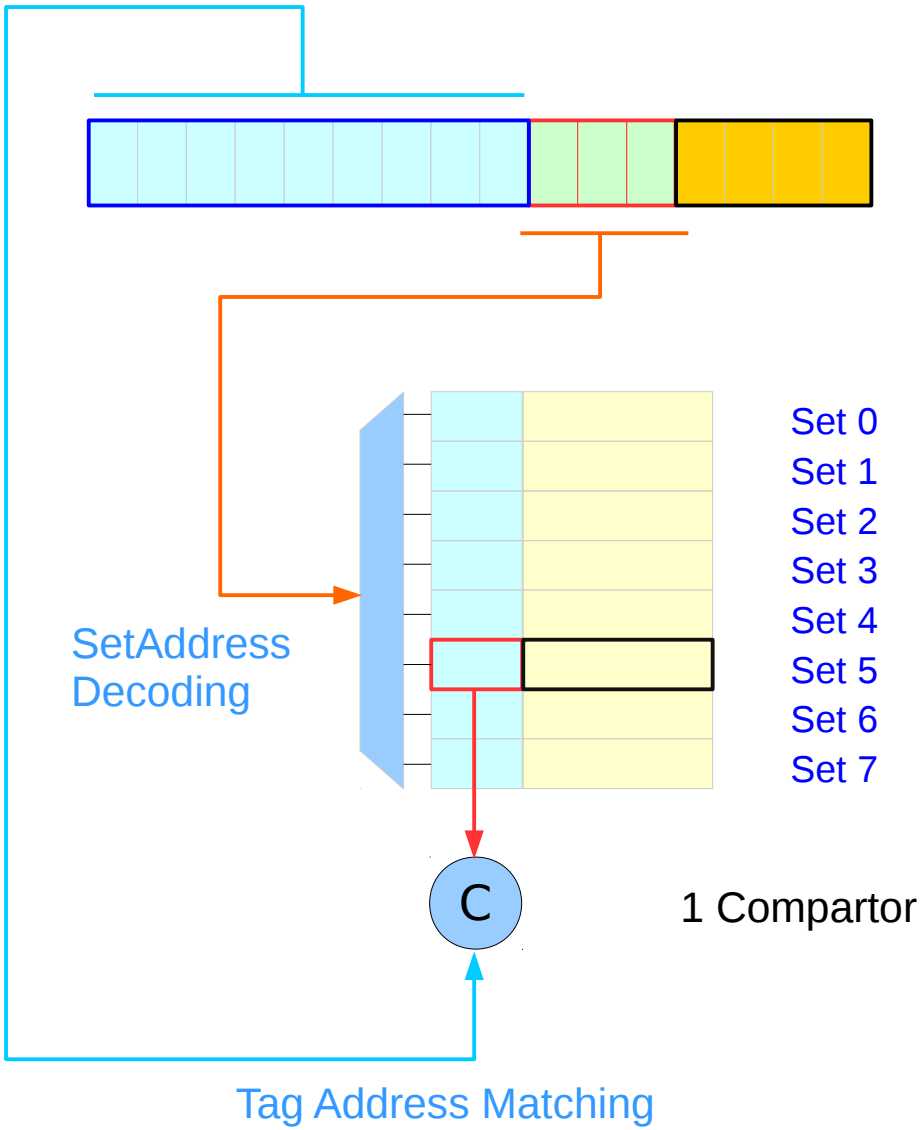
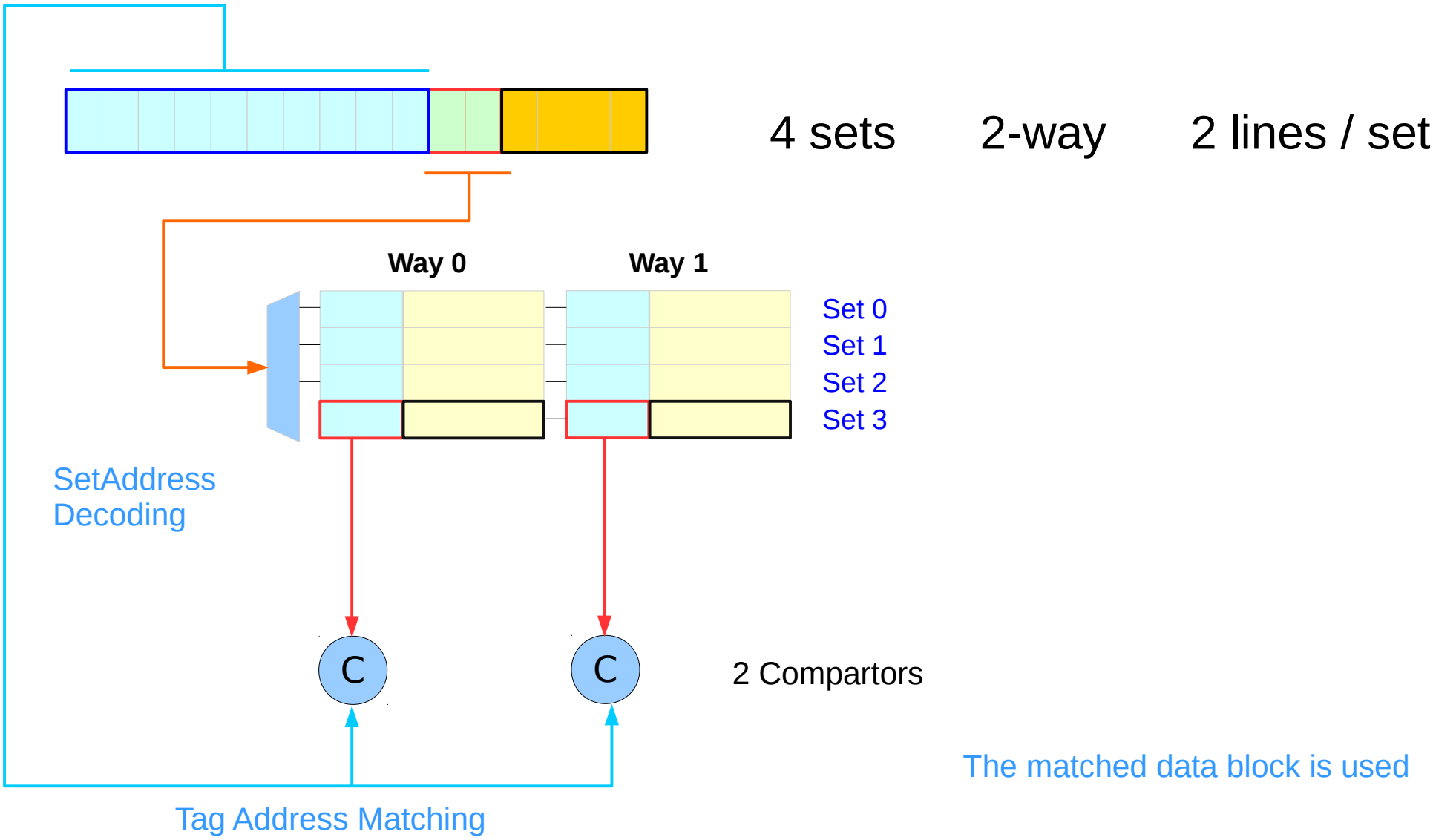
Direct Mapping



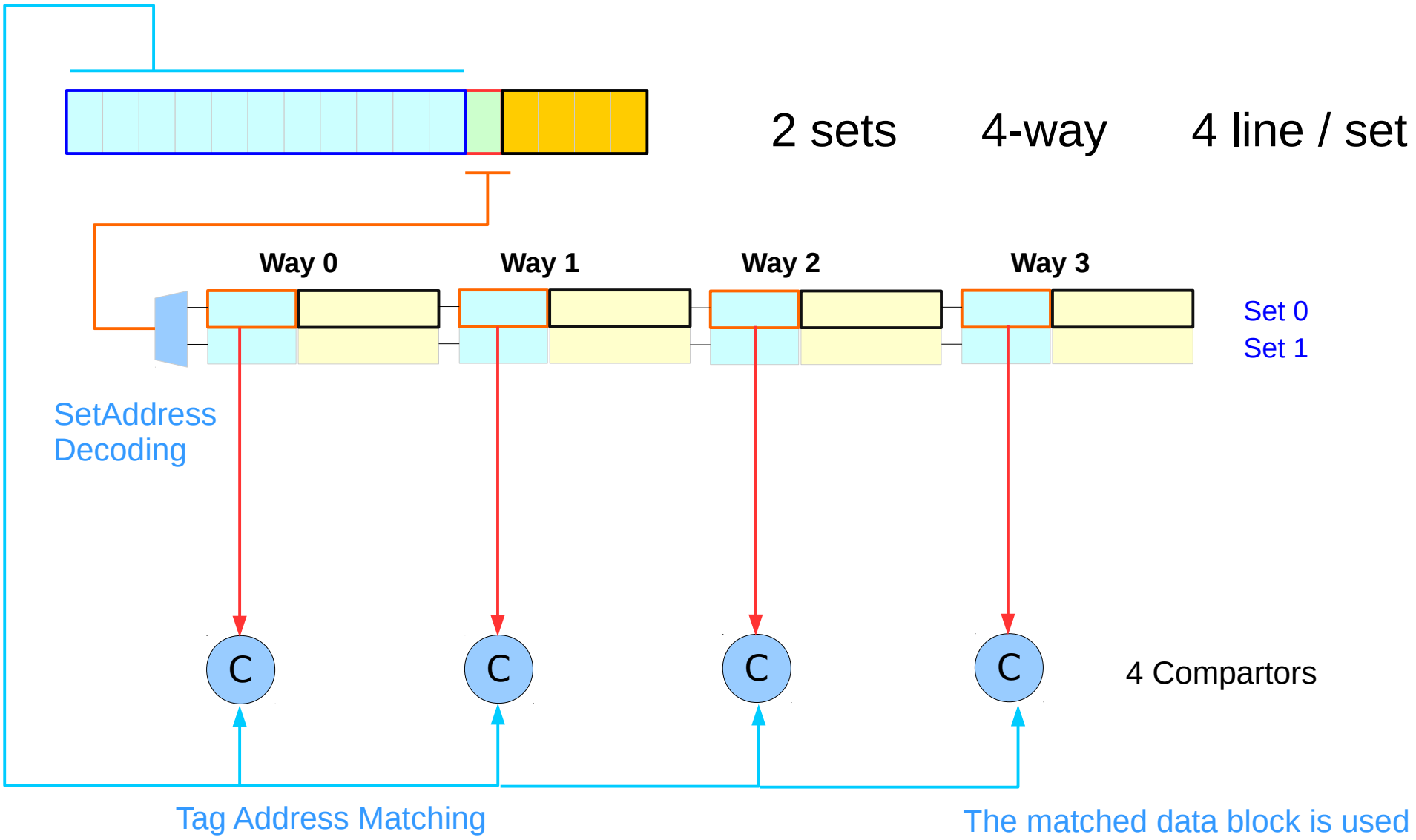
8 sets 1-way 1 line / set

The matched data block is used

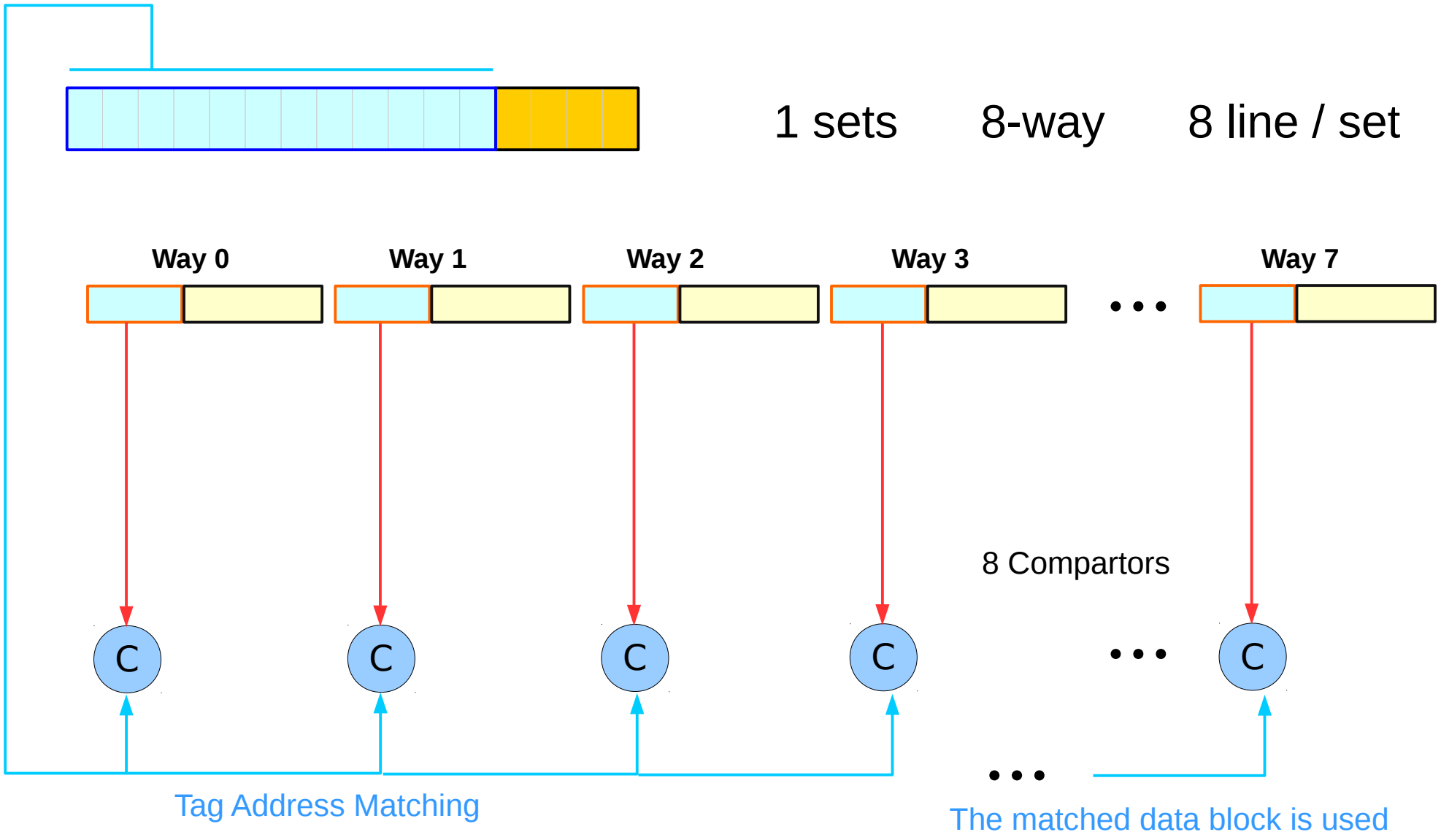
2-Way Set Associative Mapping



4-way Set Associative Mapping



Fully Associative Mapping



CAM (Content Addressable Memory)

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References

[1] http://en.wikipedia.org/
[2] https://en.wikiversity.org/wiki/The_necessities_in_SOC_Design
[3] https://en.wikiversity.org/wiki/The_necessities_in_Digital_Design
[4] https://en.wikiversity.org/wiki/The_necessities_in_Computer_Design
[5] https://en.wikiversity.org/wiki/The_necessities_in_Computer_Architecture
[6] https://en.wikiversity.org/wiki/The_necessities_in_Computer_Organization
[7] https://en.wikiversity.org/wiki/Understanding_Embedded_Software
[8] Digital Systems, Hill, Peterson, 1987