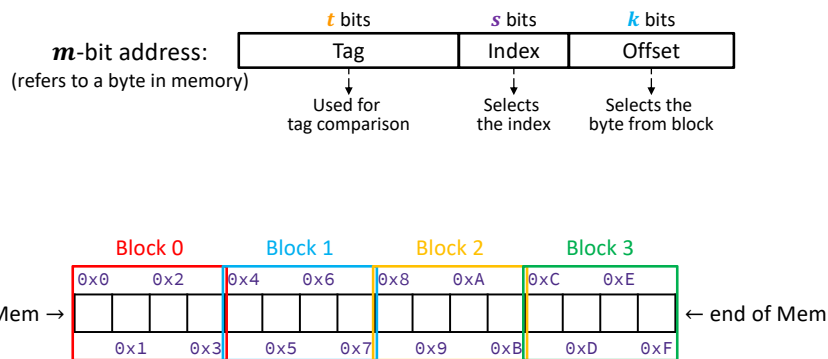
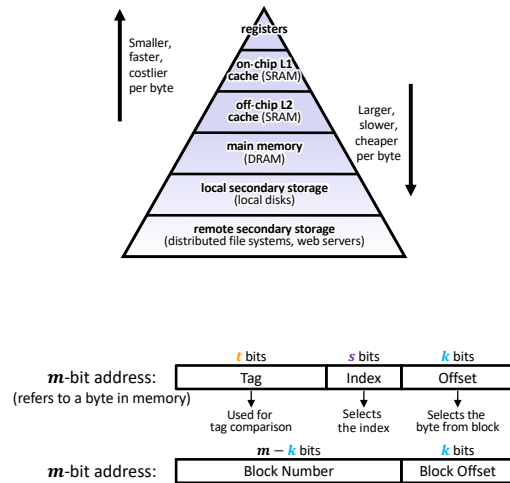
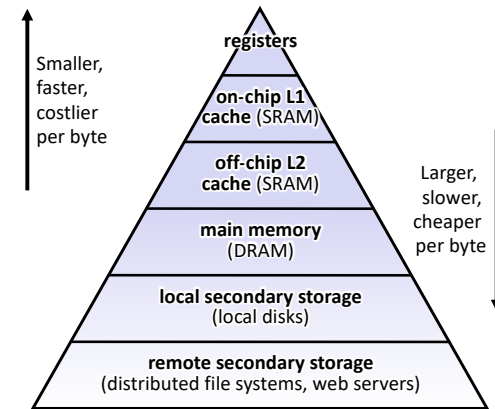


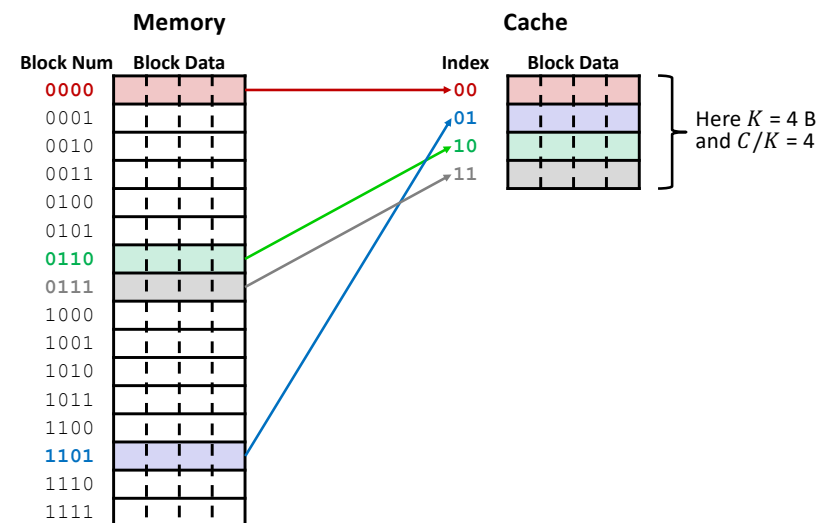
## Notes Diagrams



## Notes Diagrams



## Place Data in Cache by Hashing Address



## Review Questions

- ❖ We have a direct-mapped cache with the following parameters:
  - Block size of 8 bytes
  - Cache size of 4 KiB
- ❖ How many blocks can the cache hold?
- ❖ How many bits wide is the block offset field?
- ❖ Which of the following addresses would fall under block number 3?
  - A. 0x3
  - B. 0x1F
  - C. 0x30
  - D. 0x38

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## Polling Question

- ❖ 6-bit addresses, block size  $K = 4$  B, and our cache holds  $S = 4$  blocks.
- ❖ A request for address **0x2A** results in a cache miss. Which index does this block get loaded into and which 3 other addresses are loaded along with it?
  - Vote at [PollEv.com/wolfson](https://pollev.com/wolfson)

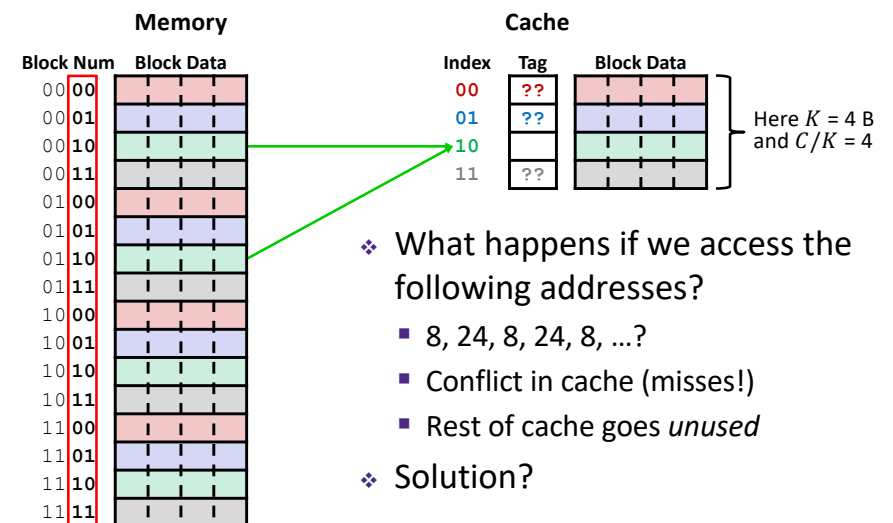
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## Cache Puzzle

- ❖ Based on the following behavior, which of the following block sizes is NOT possible for our cache?
  - Cache starts *empty*, also known as a *cold cache*
  - Access (addr: hit/miss) stream:
    - (14: miss), (15: hit), (16: miss)
- A. 4 bytes
- B. 8 bytes
- C. 16 bytes
- D. 32 bytes
- E. We're lost...

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## Direct-Mapped Cache: A Problem!



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