Videolesson 6 slides

Directory-based coherence

- Snooping:
  - Broadcast requests so others see them and to establish ordering
  - Bus becomes bottleneck!
  - Snooping does not work well with more than 8-16 cores

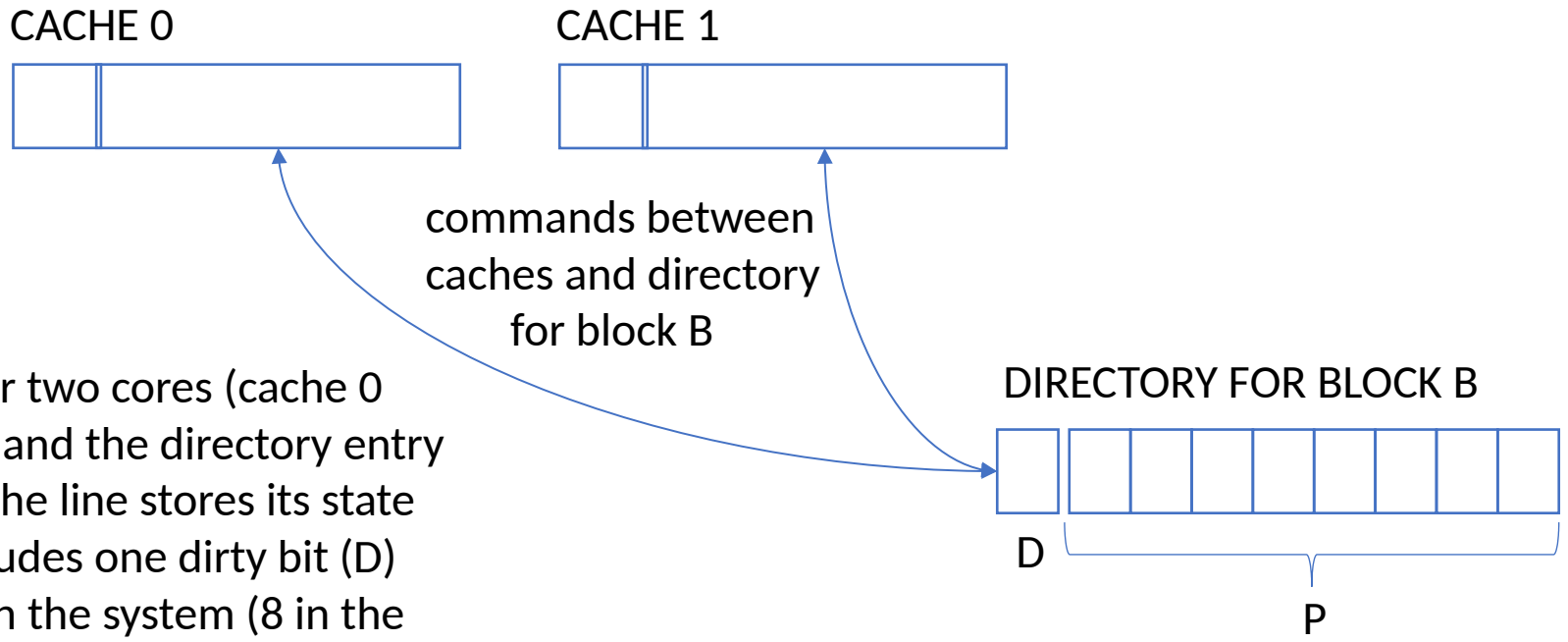
- Non-broadcast network
  - How do we observe requests we need to see?
  - How do we order requests to same block?

Directory

- Distributed across cores
- Each “slice” serves a set of blocks
  - One entry for each block it serves
  - Entry tracks which caches have block (in non-I state)
  - Order of accesses determined by “home” slice
- Caches still have same states

Directory entry

- 1 dirty bit
- 1 bit/cache: present in that cache



Note 1: diagram showing a cache line for two cores (cache 0 and cache 1) accessing memory block B and the directory entry (home) for that memory block. Each cache line stores its state and data. The entry in the directory includes one dirty bit (D) and as many presence bits (P) as cores in the system (8 in the diagram)

Note 2: Listen to explanation in video for the specific example