

# LECTURE - 26

# Lecture Outline

- Cache coherence protocols (continued)
  - Snooping-based schemes
  - Directory-based schemes
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- *Scribe for today?*

# Snooping-Based Protocols

- Applicable for write-through as well as write-back caches
- Optimizations:
  - Shared/Exclusive bit
  - Write miss and invalidate messages
  - Shared+single versus truly shared blocks
  - Maintaining separate tags
- Dirty bit required?

# Towards Directory-Based Protocols

- What properties of the multi-processor does a snooping-based protocol use?
  - Broadcast-based bus, all-to-all communication
- What if this is not possible?
  - Communication goes through a directory
  - Directory is logically shared across processors
    - Physically centralized or distributed
  - Directory entry per memory-block
  - Possible states: uncached, shared, exclusive
    - Use bit-vectors for storing these