Multi-Grain Coherence Directories

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Naturally “Private” Memory Regions
Multigrain Directory

Fewer Entries

Dynamically Refine Granularity

Memory

Coherence Directory

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Multi-Grain Coherence Directory (MGD)

Conceptual MGD Directory:

✓ Dynamically refine granularity of entries
✓ 78% fewer directory entries (on average)

Practical MGD Directory:

✓ Limited number of fixed granularities
✓ 41% less area
✓ Robust performance
✓ No coherence protocol changes