Why Another Memory Control Scheme?
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FR-FCFS [ISCA’00]
Why Another Memory Control Scheme?

PAR-BS [ISCA’08]
STFM [MICRO’07]
FR-FCFS [ISCA’00]
Why Another Memory Control Scheme?

TCM [MICRO’10]
ATLAS [HPCA’10]
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... BLISS [ICCD’14]
    SMS [ISCA’12]
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Reads

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Writes

...
Why Another Memory Control Scheme?

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... 

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Persistent Memory
Why Another Memory Control Scheme?

Reads

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Fast Load/Store
(Memory Attribute)
Why Another Memory Control Scheme?

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- FR-FCFS [ISCA’09]

Fast Load/Store (Memory Attribute)

Data Persistence (Storage Attribute)
Why Another Memory Control Scheme?

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Fast Load/Store (Memory Attribute)
Data Persistence (Storage Attribute)
Why Another Memory Control Scheme?
Our Design: Towards A FIRM Tree

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FIRM [MICRO’14]

Persistent Memory
Fairness
Performance

1.2x

vs. the best of 5 previous scheduler designs
Details about “FIRM”

*Fair and High-Performance Memory Control for Persistent Memory Systems*

Jishen Zhao  
Onur Mutlu  
Yuan Xie  

HP Labs/Penn State/CMU  
CMU  
UCSB/Penn State/AMD Research  

**Presentation:**  
Mon (Dec. 15) 3:30 PM  
Session 2A  
(Room: Dining Hall)  

**Poster Session:**  
Tue (Dec. 16) 12:00 PM