What's the Best Approach to Persistent Memory Today?

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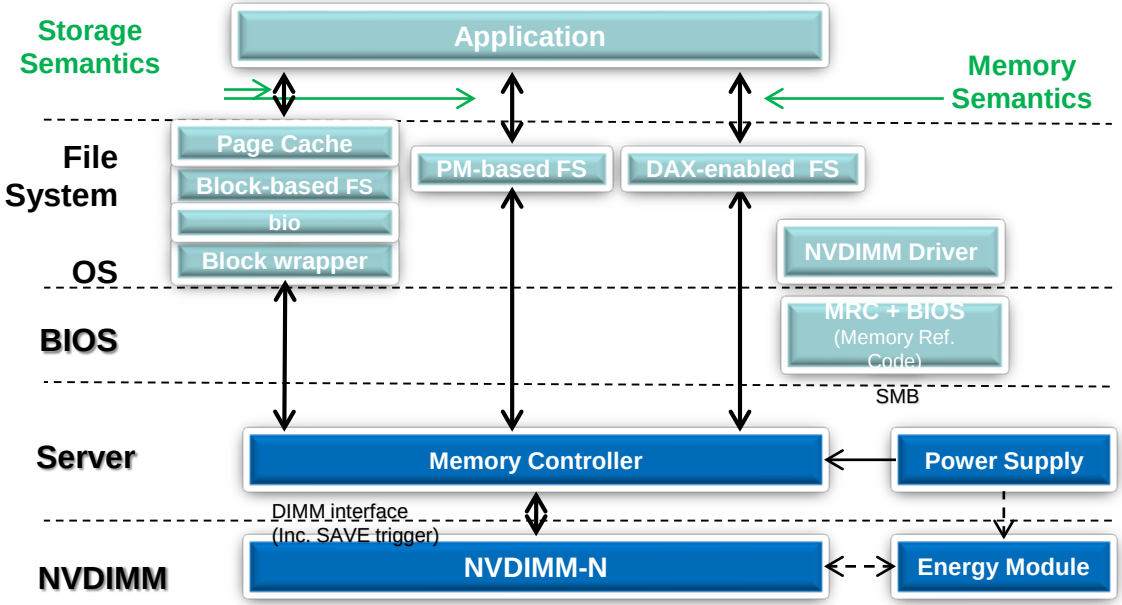
What's the Best Approach to Persistent Memory Today?

- Ecosystem Development
- Persistent Memory Use Cases
  4GB ~ 256GB / 256GB ~ >1TB
- Tools and Utilities for Managing Persistent Memory
- Existing and Emerging PM Products
- Application-driven PM solutions

Flash Memory Summit

Persistent Memory Ecosystem Enablement (NVDIMM Example)

- Standardized through NFIT and JEDEC
- Linux 4.4+ kernels have the software stack
- Windows server support
- Open source library is available for applications



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Persistent Memory Use Cases
4GB ~ 256GB

Enterprise Storage
Tiering, caching,
write buffering,
meta data storage

Traditional Database
Log acceleration
by write combining
and caching

In-Memory Database
Journaling,
recovery time, tables

High-Performance Computing
Check point
acceleration
and/or elimination

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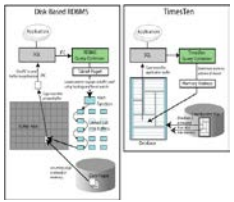
Persistent Memory Use Cases 256GB ~ >1TB

Virtual Desktop Infrastructure

Higher VM consolidation

Big Data

For Higher Performance



In Memory Database

Middleware Optimized abstraction

Source: modified from Micron HPE Discover 2018

Tools and Utilities for Managing Persistent Memory

(NVDIMM Example)

- Even though NVDIMMs are JEDEC-standard there are no open source utilities
  - Write/read data patterns
  - Backup/restore automated testing
  - Firmware updates (hdparm for SSDs)
  - Status updates (i.e., smartmontools for SSDs)

- How can we come up with an open source management utility for Persistent Memory and NVDIMMs?

Existing and Emerging PM Products

Source: modified from Micron HPE Discover 2018

Application-Driven PM solutions

- No one single PM solution
- Different use cases will use different PM solutions
- Not enough useful business applications developed and available that are PM aware

Thank You!