What is the Best Approach to Persistent Memory Today and Tomorrow

Mark Webb

MKW Ventures Consulting, LLC

mark@mkwventures.com

Flash Memory Summit

We Have a Great Panel of Experts

- Rahul Advani, Netlist, VP Marketing
- Bill Leszinske, Retired Corporate VP from Intel NVM Solutions Group
- Arthur Sainio, Smart Modular, Director Product Marketing
- Pankaj Bishnoi, Everspin, Director of Business Development

Mark Webb, MKW Ventures

A Persistent Memory Definition

- It’s persistent … No need to worry about loss
- It’s accessed like memory on memory bus
- Speed: system less than 1us latency (I can do storage at 6-10us)
- Endurance “good enough” to meet needs required by application
- Used for data being worked on and addressed by programs. Not primarily used as cold or warm storage
- It’s a billion dollar market in 2019 and growing rapidly

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What's Shipping Today?

- NVDIMM-N is "classic" version of persistent memory DIMM
  - Addressed just like DRAM in a DIMM
  - Backed to NAND periodically or when power lost
  - Typical NVDIMM is 16G DRAM plus 32G of SLC NAND with control and capacitor/battery
  - Appears as 16GB of DRAM at DRAM speed
  - Has been selling for years now in a variety of applications
- NEW: Intel Optane DC Persistent Memory
  - App direct mode is the "classic" PM we want! Up to 512GB DIMMS
  - Memory mode acting as large main memory with DRAM cache

Intel DC Persistent Memory

- 128, 256, 512GByte DIMMS
- System Speed is listed at 350ns Read Latency, Write is “higher”
  - Slower than DRAM, much faster than NAND
- No cycling limit in applications
- Ability to support TBs of addressable memory… and its persistent
- Servers shipping from multiple OEMS today. HPE, Dell, Lenovo, Supermicro, etc.
- Requires Cascade Lake CPU, but is supported on majority of SKUs.
- TBs of addressable memory that meets our definition of PM shipping to people who want it.

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Questions

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