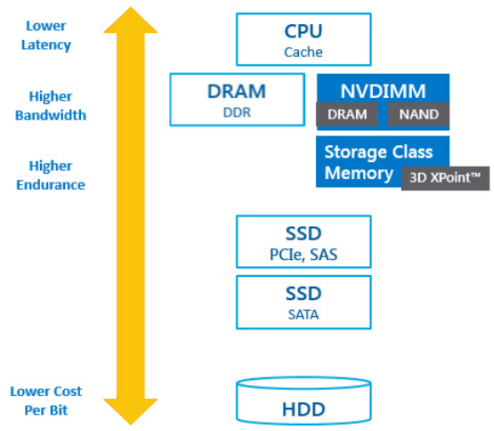
NVDIMM: Persistent Memory Performance

Micron's nonvolatile DIMMs (NVDIMMs) combine the speed of DRAM with the persistent storage of NAND flash to remove I/O bottlenecks and deliver big performance.

Applications

- Big data analytics
- Storage appliances
- RAID cache
- In-memory database
- On-line transaction processing



Persistent Memory
NVDIMMs are a compelling new option in the memory/storage hierarchy, offering DRAM-like low latency with the nonvolatility of NAND to back up data if power is lost. Storage-class memories like 3D XPoint technology will comprise a second tier of high-capacity persistent memory solutions.

Powerful. Persistent. NVDIMM.

Persistent memory is a new product family that gives system architects an unprecedented choice for balancing system performance and total cost of ownership.

Persistent memory bridges the gap between DRAM and storage, allowing greater flexibility in data management by providing nonvolatile, low-latency memory closer to the processor. Because it resides on the DRAM bus, persistent memory can provide ultra-fast DRAM-like access to critical data. Combining the data reliability of traditional storage with ultra-low latency and high bandwidth opens up opportunities to optimize systems and manage data in a whole new way.

Product Details

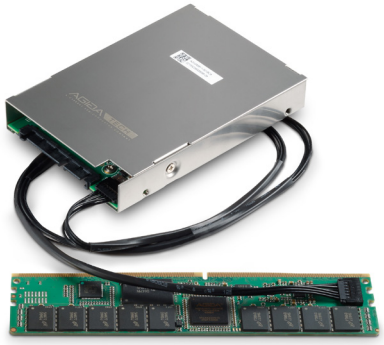
NVDIMMs are a nonvolatile persistent memory solution that combines NAND flash, DRAM and an optional power source into a single memory subsystem. They deliver DRAM-like latencies and can back up the data they handle, providing the ability to restore quickly if power is interrupted.

NVDIMMs operate in the DRAM memory slots of servers to handle critical data at DRAM speeds. In the event of a power fail or system crash, an onboard controller safely transfers data stored in DRAM to the onboard nonvolatile memory, thereby preserving data that would otherwise be lost. When the system stability is restored, the controller transfers the data from the NAND back to the DRAM, allowing the application to efficiently pick up where it left off. The backup power source for Micron's NVDIMMs can be provided either by a tethered AgigA Tech® PowerGEM® ultracapacitor or by routing a persistent supply through the motherboard to the DRAM 12V pins.

NVDIMMs provide performance and data security advantages for a wide range of enterprise-class server and storage applications.

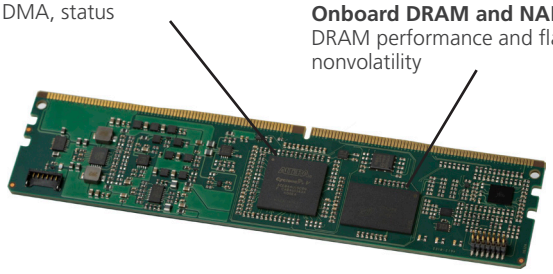
Micron®

Ultracapacitor Module
Self-contained energy source for backup operation during power failure



NVDIMM Controller
Flash management, high-speed DMA, status

Onboard DRAM and NAND
DRAM performance and flash nonvolatility



NVDIMM Architectures

- 8GB DDR4 NVDIMM 2133 MT/s – Production now
- 16GB DDR4 NVDIMM 2666 MT/s – Production now
- 32GB DDR4 NVDIMM 2933 MT/s – Production 1Q18

Benefits of NVDIMM Persistent Memory

Higher Performance – Accelerates business applications by increasing metadata performance.

Reliability – Preserves critical data in the event of a power loss.

Cost-Effectiveness – Improves TCO by delivering a unique balance of latency, bandwidth, capacity and cost.

Compatibility – JEDEC-standard interface significantly expands capability and facilitates easy customer adoption.

Why Micron for NVDIMMs?

World's Memory Expert – Industry's broadest portfolio of memory solutions and systems

Memory Developer – Micron is one of the world's only memory suppliers who develops all major memory types — DRAM, NAND and NOR

Global Supplier to the Enterprise Memory Market – Micron designs and builds in quality and reliability from wafer to end product

Long-Term Roadmap

Micron has long-running plans for persistent memory solutions, including eventual storage-class memory products.

micron.com

Products are warranted only to meet Micron's production data sheet specifications. Products and specifications are subject to change without notice. Dates are estimates only.

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