

Introducing a new memory tier



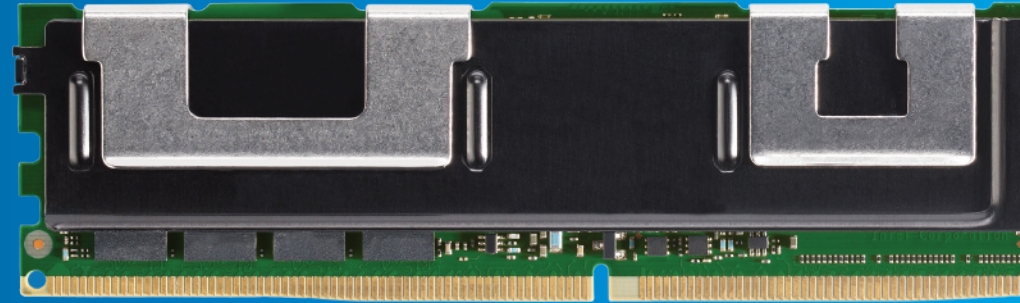
As data demands evolve, Intel and Cisco have partnered to fill the gaps in the memory and storage hierarchy with alternatives that **combine the positive value of storage and memory** in a range of affordable, high-performance solutions.

Intel® Optane™ persistent memory

Larger in-memory working datasets

- Addresses the **memory capacity shortfall** by **extending available memory** and **adding persistence**
- Attaches to memory bus for **extremely low latency**

Keywords: SAP HANA*, Oracle*, Microsoft SQL Server*, Microsoft Hyper-V*, VMware vSphere*, HCI, memory, storage, latency, restart time



Ordering guide

Cisco UCS* servers featuring Intel Optane persistent memory deliver ultra-fast persistent storage, improved TCO, increased memory size, and improved system performance for SAP HANA* in-memory analytics, Microsoft SQL Server* database, and VMware* virtualization and consolidation workloads.¹

CISCO* SERVERS SUPPORTING INTEL OPTANE PERSISTENT MEMORY

- Cisco UCS B200 M5 Blade Server
- Cisco UCS B480 M5 Blade Server
- Cisco UCS C220 M5 Rack Server
- Cisco UCS C240 M5 Rack Server
- Cisco UCS C480 M5 Rack Server

INTEL OPTANE PERSISTENT MEMORY MODULES

MEMORY CAPACITY	CISCO* PART NUMBER
128GB	UCS-MP-128GS-A0
256GB	UCS-MP-256GS-A0
512GB	UCS-MP-512GS-A0

Why upgrade



SAVE MORE

- Displace costly DRAM in large-memory systems
- Improve TCO for workloads that need large/persistent memory¹
- Support more customers without skyrocketing costs^{1,2}



DO MORE

- Extract more value from larger datasets than previously possible
- Consolidate workloads with up to 36% more VMs per node³
- Scale delivery of services while maintaining QoS



GO FASTER

- Break I/O bottlenecks in read-heavy workloads
- Reduce latency and data access time
- Provide compelling application-level performance

Say this to your customer

“Would your workloads benefit from **large-capacity memory** servers at an affordable price?”

“Imagine how efficient your services will be when you **move from three 9s to five 9s of availability with data persistence.**”

“Are the **TCO, server footprint, and complexity associated with storage scale-up** preventing you from upgrading your infrastructure?”

“Have your applications and data outgrown your **current DRAM capacity?**”

“What could your organization do with **lower-latency reads for database or virtualization workloads?**”

Two configurations to meet data center demands



Memory mode

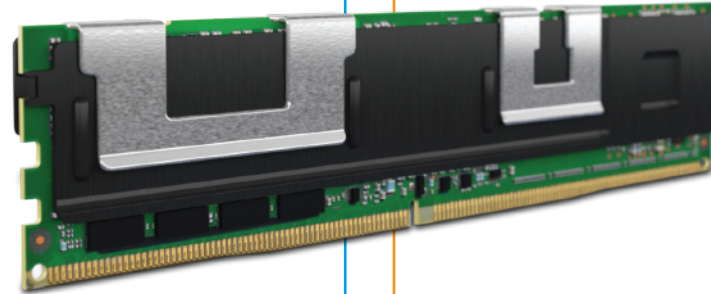
Affordable, large, volatile memory for memory-constrained workloads. Intel Optane persistent memory functions as **volatile memory**, while DRAM functions as cache.

IDEAL FOR:

- High-capacity virtualization
- Content delivery networks
- In-memory database
- Infrastructures with system memory >500GB

BENEFITS:

- High-capacity memory
- Lower cost per GB compared to DRAM³
- Ease of adoption⁴
- No software changes required



App Direct mode

Software and applications communicate directly with Intel Optane persistent memory, which functions as **persistent memory**—while DRAM functions as volatile memory (requires software changes).

IDEAL FOR:

- In-memory database
- Super-fast storage
- Caching layers

BENEFITS:

- Data persistence with higher capacity than DRAM⁵
- Byte addressable
- High availability, minimal downtime
- Higher endurance and greater bandwidth compared to NAND SSDs



Intel Optane persistent memory works on systems powered by 2nd Generation Intel Xeon Platinum or Gold processors.

Help businesses extract actionable insights from their data with Cisco servers featuring **Intel Optane persistent memory**.

Contact your Intel representative or visit intel.com/optane

1. Cost-reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

2. Up to 30% lower cost per VM: Baseline system: Memory subsystem/socket: 384GB DRAM (12x32GB); CPU: 2x Intel Xeon Platinum 8276 processor (CLX, 28-core); Total storage cost: \$7200; SW cost: \$0; Relevant value metric: 22.00; Type of system: DRAM/Purley, CPU cost: \$17,438; Memory subsystem: Total capacity: 768GB (384GB/socket) \$8,993; DRAM: 24x32GB \$8,993, AEP: N/A \$0; Chassis, PSUs, boot drive, etc. \$1300; Total system cost: \$34,931. Compared to Intel Optane PMem system: Memory subsystem/socket: 4x128GB AEP+6x16GB DRAM, 2-2-1, memory mode; CPU: Intel Xeon Platinum 8276 processor (CLX, 28-core); Total storage cost: \$7200; SW cost: \$1; Relevant value metric: 30.00; Type of system: AEP, memory mode; CPU cost: 2x Intel Xeon Platinum 8276 processor (CLX, 28 core) \$17,439; Memory subsystem: Total capacity: 1024GB (512GB/socket) \$7,306; DRAM: 12x16GB \$2,690, AEP: 8x128GB \$4,616; Chassis, PSUs, boot drive, etc. \$1300; Total system cost: \$33,244.

3. Up to 36% more VMs per node: Similar cost DDR4 system: Intel Xeon Platinum 8272L processor, Turbo on, HT on, DDR memory/node: 768GB; Boot storage: 1x Samsung PM963 M.2 960GB; App storage: 7x Samsung PM963 M.2 960 GB, 4x Intel SSD DC S4600 Series (1.92TB); OS: Windows Server* 2019 R5-17763; Test: OLTP* Cloud Benchmark. Compared to Intel Optane PMem system: Intel Xeon Platinum 8272L processor, Turbo on, HT on, DDR memory/node: 192GB; Intel Optane PMem/node: 1TB; Boot: 1x Samsung PM963 M.2 960GB; App storage: 7x Samsung PM963 M.2 960 GB, 4x Intel SSD DC S4600 Series (1.92TB); OS: Windows Server 2019 R5-17763; Test: OLTP Cloud Benchmark.

4. A BIOS update will be required before using Intel Optane persistent memory.

5. Intel Optane persistent memory offers three different capacities: 128GB, 256GB, and 512GB. The maximum capacity for an individual DIMM of DDR4 DRAM is 256GB.

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