Direct Scale-Out Flash
Optane Performance and Markets
FMS, August 2017

Apeiron Addresses

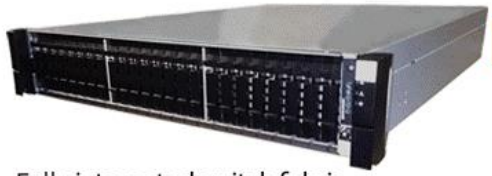
Apeiron was founded to address three inflection points in the storage market:

- Move to application managed scale out storage - ***Applications now understand how to manage storage***
- Demand for real-time queries on massive data sets - ***Captive storage cannot manage the required capacity: storage networking is required***
- The rapid adoption of NVMe as the standard SSD interface – ***NVMe has created two new bottlenecks; the controller and the fabric protocol***

ADS1000 Scale-out NVMe Solution Unmatched Performance, Scalability and Efficiency

720TB
Sep '17

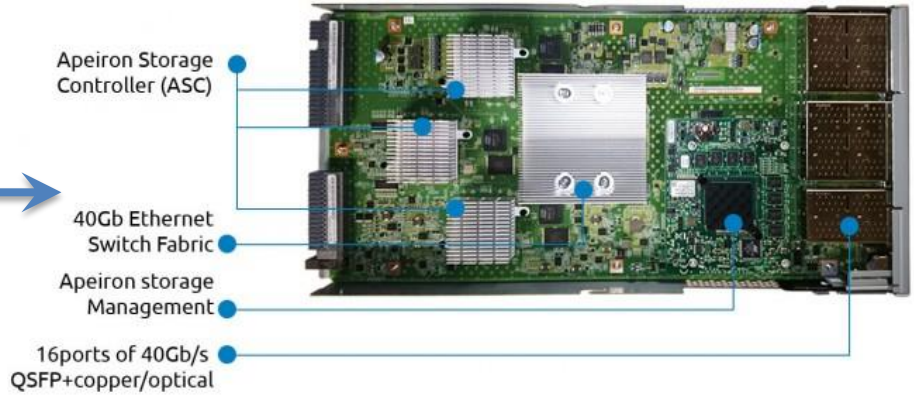
24 NVMe 2.5" SSD



Fully integrated switch fabric

32 Apeiron Data Fabric Ports | Field Serviceability | Redundant PS & Cooling Modules

ADS1000 Performance (2U)	
Capacity	38/76/154/184/360TB
Latency (NAND LIMITATION)	100µs
Protocol Overhead	<3µs (roundtrip)
Bandwidth sustained	72 GB/s (drive limited)
Random 4K reads	**18.4 M IOPS**



x2 ADS40G-HBA | 40 GbE Data Fabric ports | Dual port 10 GBaseT

Apeiron FMS Demo-What are we looking at?

4x Intel Optane	4x Micron NAND	4x Toshiba NAND	8x Samsung NAND

Server-1: x86 Dual Proc, Internal Optane AIC

Server-2: Connected to Four Intel Optane U.2

Server-3: Connected to Four Toshiba 7.68TB

Server-4: Connected to Four Micron 2.4TB

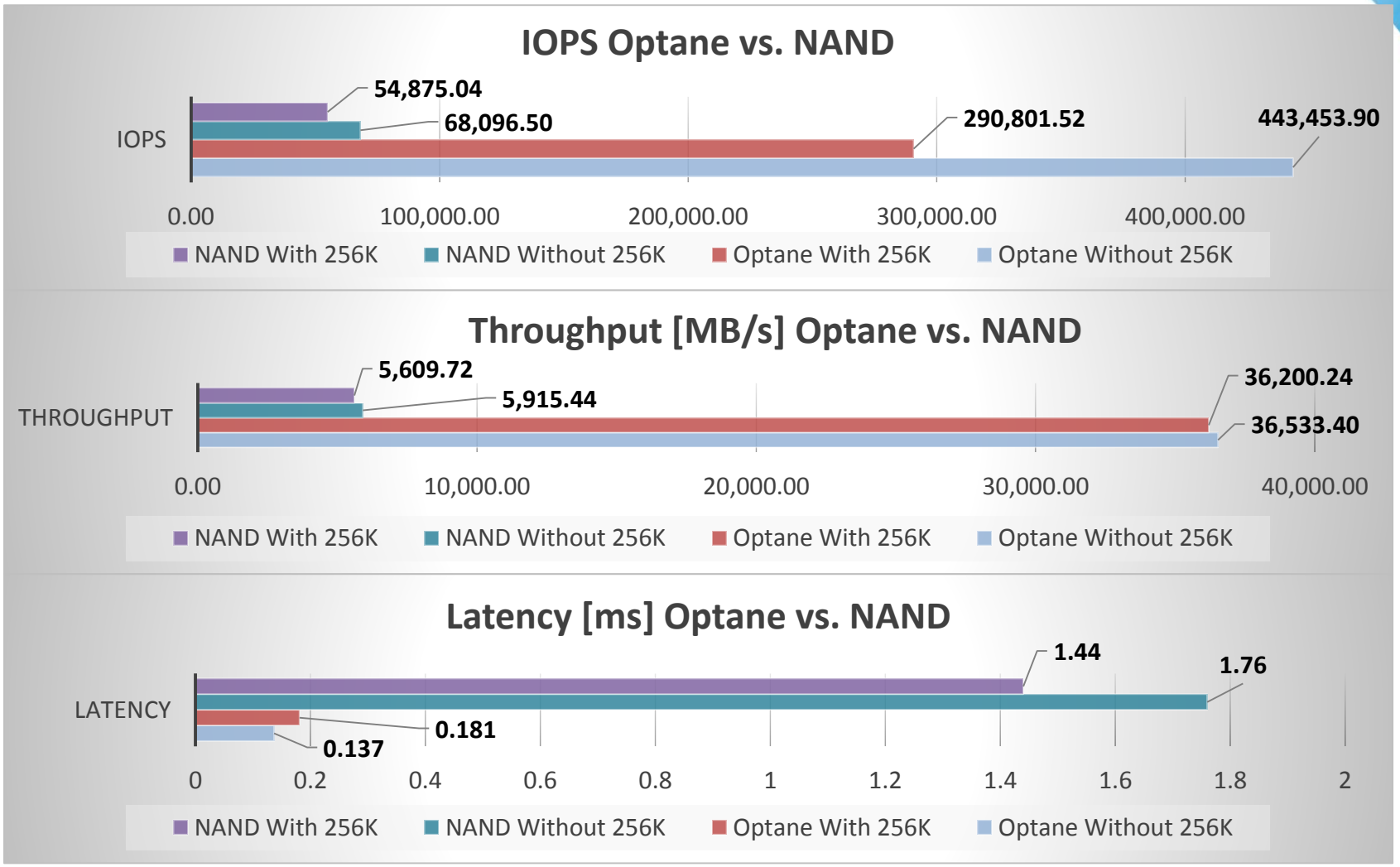
Server-5: Connected to Four Samsung 800GB

Server-6: Connected to Four Samsung 800GB

Server-7: Cluster Manager/Graphics Display

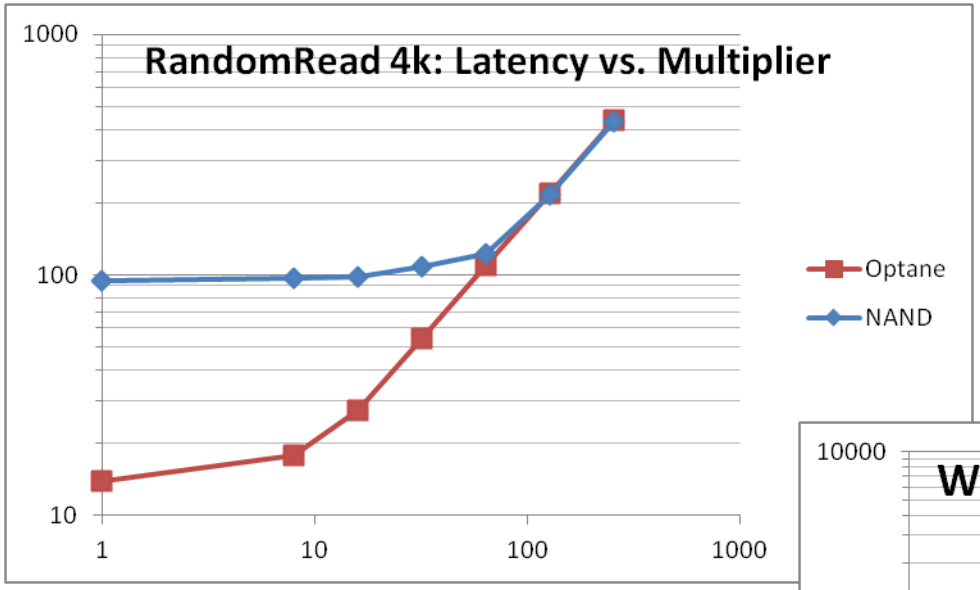
Apeiron can support NVMe SSDs from ANY supplier, resulting in simplification and consolidation

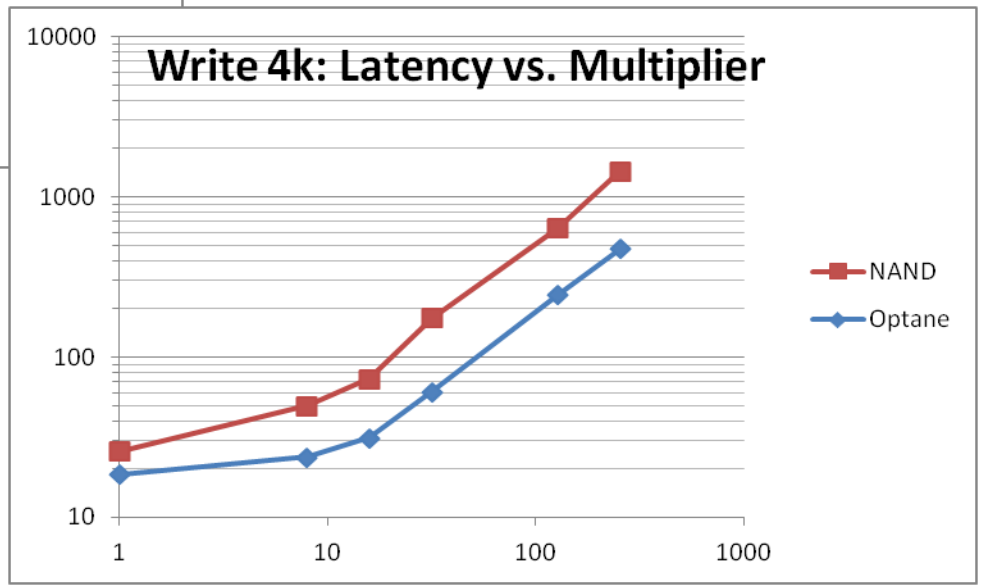
How does Optane Compare?



Optane vs. NAND Performance Comparison

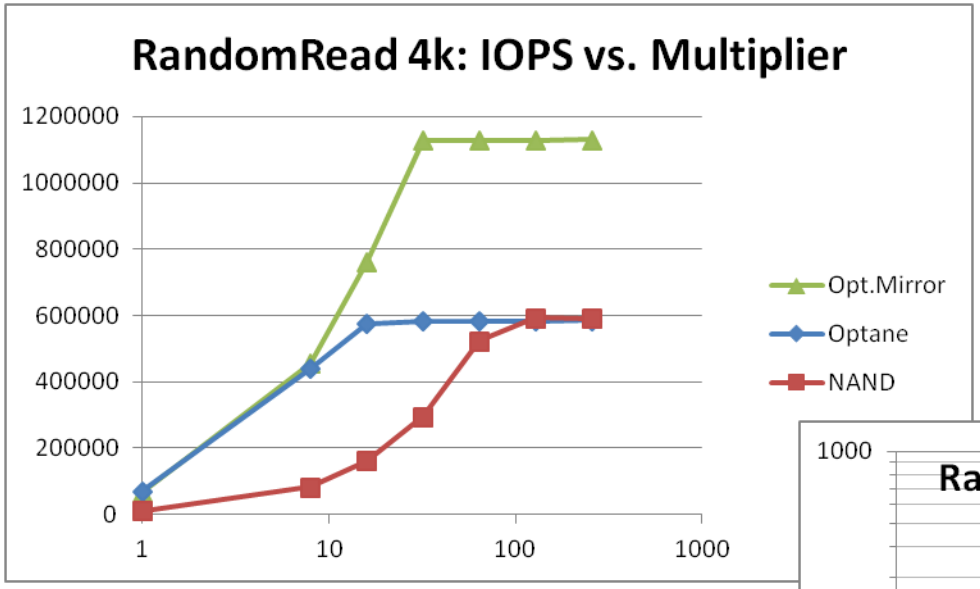
FIO: 4k Latency vs. Multiplier (JobsxQdepth) RandomRead & Write

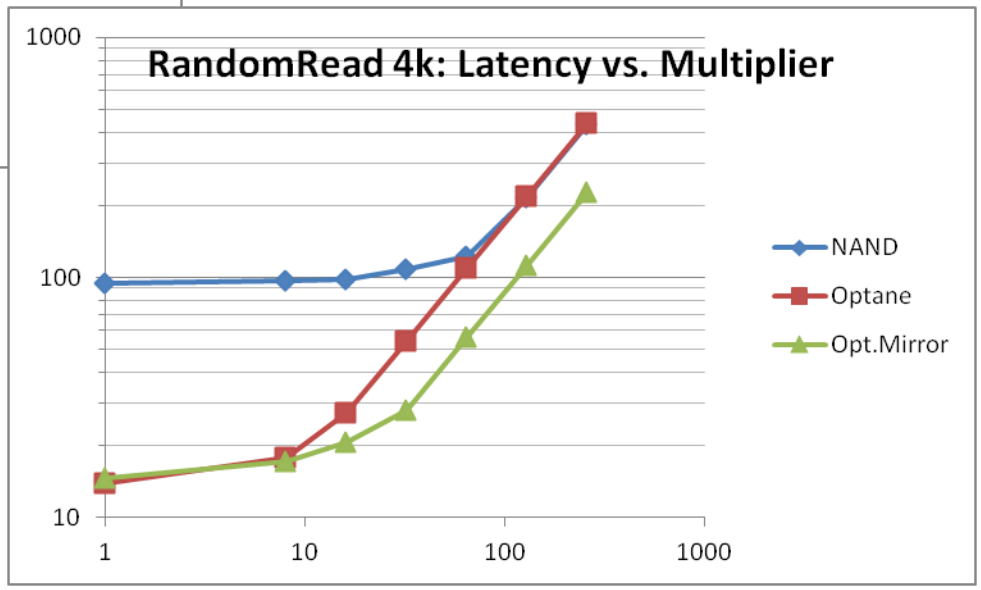




Optane & OptaneMirror vs. NAND Performance

FIO: 4k IOPS vs. Multiplier (JobsxQdepth) RandomRead & Write





Where are we proposing Optane

Although most environments benefit, we are focused on:

- HPC: Optane performance characteristics have a dramatic impact on file system “Warm up”. Working to demonstrate extended memory with Apeiron and Optane now.
- High frequency trading, analytics and fraud detection
- “application caching”…Apeiron can accommodate multiple applications, sharing Optane as a cache layer.
- Video ingestion and analytics.