Oracle ZS4-4 Hybrid Storage Array Tops NetApp FAS8080 EX in Architecture, Database Storage Efficiency and Performance Tools

By Chuck Cook, DCIG Senior Analyst

Hybrid storage arrays are rapidly becoming the preferred storage platform in many enterprises to host Oracle databases and accelerate their performance. As enterprises evaluate possible options such as the NetApp FAS8080 EX and Oracle ZS4-4 storage array, the Oracle ZS4-4 tops the NetApp FAS8080 EX with an architecture that supercharges Oracle Database performance while optimizing available storage capacity.

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Oracle ZFS Storage ZS4-4
Hybrid Storage Array

DIFFERENTIATORS

- Storage architecture tuned to deliver the highest levels of Oracle Database performance
- Co-engineering with native Oracle Database 12c features delivers:
  - Unparalleled visibility and dynamic tuning automation to optimize Oracle Database performance
  - Efficiencies in storage capacity with up to 50x compression

Hybrid storage arrays, which dynamically place data in storage pools that combine flash memory and HDDs, are rapidly expanding their market share in the enterprise space. These arrays use the latest generation of hardware—including multi-core CPUs and DRAM and flash caches—to offer high levels of performance and inline data optimization.

When businesses evaluate storage solutions for their Oracle Database environments, the Oracle ZFS Storage ZS4-4 hybrid storage array and the NetApp FAS8080 EX are likely to make it onto many enterprise buying short lists. On the surface, the two arrays offer similar functionality. However, the ZS4-4's underlying architecture and its unique ability to integrate with Oracle Database 12c make it a superior storage platform to accelerate Oracle Database performance and reduce storage capacity requirements.

High Performance Architecture

The ZS4-4 hardware includes 120 processor cores and 3 TB of DRAM cache. This is 3x the number of CPU cores and 12x the amount of DRAM cache found in the NetApp FAS8080 EX. The ZS4-4's Symmetric Multi-Processing (SMP) OS8.3 takes full advantage of this superior processing power as it can run all 120 cores in parallel while the ZS4-4's DRAM-centric architecture leverages its 3TB DRAM cache size to service up to 90% of IOs from ultra-low latency DRAM. The ZS4-4 also dynamically adjusts I/O packet sizes sent by an Oracle Database 12c to accelerate and optimize data transmissions.

Superior Data Storage Efficiency

Both the ZS4-4 and the FAS8080 EX offer deduplication and compression but only the ZS4-4 utilizes Automatic Data Optimization (ADO) with Hybrid Columnar Compression (HCC) to automate storage tiering and compression of Oracle Database 12c data. ADO uses heat map data—in combination with usage patterns and/or user-defined policies—to automatically move and/or compress Oracle Database 12c data. *"Hot"* data may be left uncompressed while *"cool"* or *"cold"*

data may be compressed which may yield 10x to 50x space savings.

Storage Performance Tuning and Visibility

The Oracle Intelligent Storage Protocol (OISP)—available with Oracle Database 12c—passes metadata directly to the ZS4-4, enabling the database to dynamically setup and tune itself. ZS Analytics can then be used to pinpoint bottlenecks and optimize storage performance in real-time which the FAS8080 EX does not offer.

> *"The ZS4-4's outstanding architectural design, storage efficiencies and co-engineering with Oracle software optimize Oracle Database performance and reduce storage capacity requirements in ways that the NetApp FAS8080 EX simply cannot match"*
>
> — **Chuck Cook, DCIG Senior Analyst**

By co-engineering with Oracle Database, the Oracle ZS4-4 obtains real-time analytics across thousands of pluggable databases. With 12c, enterprises can run a container database that hosts hundreds of pluggable databases. The net result is up to a 5x increase in scalability with 6x less resources than a conventional database implementation. In contrast, NetApp management software provides limited to no visibility into the individual pluggable databases or container databases.

The Oracle ZS4-4 leverages Oracle's inherent in-depth knowledge of Oracle Database 12c to deliver radically better data efficiency and database performance than competing solutions as the ZS4-4 may be viewed as an extension of Oracle Database. Deploying the ZS4-4 with Oracle Database 12c enables enterprises to capitalize on its architectural design, storage efficiencies and management tools to optimize Oracle Database performance and reduce storage capacity in ways that the NetApp FAS8080 EX cannot yet deliver. ∎

Oracle ZS4-4 Hybrid Storage Array Key Competitive Advantages

FEATURE		Oracle ZFS Storage ZS4-4	NetApp FAS8080 EX
High Performance Architecture	*CPU Cores*	120	40
	DRAM Cache (Max GB)	3,000	256
	Flash Cache (Max TB)	40	24
	Optimize I/O by Varying Packet Size	✓	⊗
Data Storage Efficiency	*Heat Map with ADO and HCC*	✓	⊗
Storage Performance Tuning and Database Visibility	*Oracle Intelligent Storage Protocol (OISP)*	✓	⊗
	Pluggable Database Visibility & Real-Time Analytics	✓	⊗
	Application-aware Analytics	✓	⊗
Enterprise Manager Integration with Provisioning		✓	⊗

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