Cheat Sheet: Oracle Sun ZFS Storage 7000 Series vs. Network Appliance FAS Series

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What Is It?

The NetApp FAS (Fabric Attached Storage) series of storage products was refreshed in November 2010. The family spans from the midrange to the enterprise with three market segments: the FAS2000 series (low-end to midrange), the FAS3200 series (midrange) and the FAS6200 series (Enterprise).

The FAS line consists of two tiers (controllers + disk) and functions as both a file and block storage target.
   The FAS2000 series has three options: FAS2020, FAS 2040 and FAS2050. The FAS3200 series has three options: the FAS3210, FAS3240 and FAS3270. The FAS6000 series consists of three options: the FAS6210, FAS6240 and FAS6280.

Common features in NetApp FAS storage include: 1) Data ONTAP Operating System; 2) Host connectivity: FCH, iSCSI or NAS; 3) rack form factors; 4) Storage tier targets of tier 1, 2, 3; 5) base controller + expansion design; 6) disk choices of SAS, SATA and FCH; 6) hot-swap fans and power supplies and 7) host connectivity of FCH, iSCSI or NAS.

The differences in the three FAS lines include: 1) Size and type of expansion chassis and controllers; 2) scalability of disks (number); 3) memory, footprint; 4) heat dissipation; 5) bundled software, 6) software options and 7) clustering option.

Oracle Sun ZFS Storage 7000 Series vs. NetApp FAS Series:

Oracle Sun ZFS Storage 7000 Series Storage comes bundled with protocol (NFS, CIFS, HTTP, HTTP, FTP, WebDAV, iSCSI, FCH) data services (clone, snapshot, compression, etc) and operating system (Solaris, Linux, Windows) support

Hybrid Storage Pool (HSP): higher-use data is automatically placed and optimized in DRAM, Flash and Disk

Solaris DTrace Analytics Software: unique ability to provide real-time visibility throughout the data path

7000 Series storage based on OpenSolaris ZFS Unique file system

Oracle Disk to app: The Oracle offers all parts to the IT stack from servers, storage and database to middleware and application software

Where We Compete: We should position the 7000 Series storage against all but the highest-end NetApp FAS storage.

Mkt Space	NetApp FAS Family	Capacity (TB)	# of proc x core @ freq / DRAM / RD SSD/ WRT SSD	7000 Series	Capacity (TB)	# of proc x core @ freq / DRAM / RD SSD/ WRT SSD
Mid-Range	NetApp FAS2020	12 – 68	2 x 6 @ 2.93 X5670 / 2 GB / N/A / N/A	7120	Up to 120	1 x 4 @ 2.4 Xeon / 24 GB / N/A / 96 GB
Mid-Range	NetApp FAS2040	12 – 136	1 x 1 @ 1.66 Xeon / 8 GB / N/A / N/A	7120	Up to 120	1 x 4 @ 2.4 Xeon / 24 GB / N/A / 96 GB
Mid-Range	NetApp FAS2050	20 - 104	1 x 1 @ 2.2 Celeron / 4 GB / N/A / N/A	7320	Up to 192	2 x 4 @ 2.4 Xeon / 72 GB / 2 TB / 288 GB
Mid-Range	NetApp FAS3210	Up to 480	1 x 2 @ 2.33 E5220 / 8 GB / .5TB / N/A	7420	Up to 1,150	4 x 6 @ 1.86 Xeon / 512 GB / 2 TB / 1.7 TB
Mid-Range	NetApp FAS3240	Up to 1,200	1 x 2 @ 3.0 E5240 / 16 GB / 1 TB / N/A	7420	Up to 1,150	4 x 6 @ 1.86 Xeon / 512 GB / 2 TB / 1.7 TB
Mid-Range	NetApp FAS3270	Up to 1,920	2 x 2 @ 3.0 E5240 / 16 GB / 2 TB / N/A	7420	Up to 1,150	4 x 8 @ 2.0 Xeon / 512 GB / 2 TB / 1.7 TB
Enterprise	NetApp FAS6210	Up to 2,400	2 x 4 @ 2.26 E5520 / 48 GB / 3 TB / N/A	7720	Up to 720	4 x 8 @ 2.26 Xeon / 512 GB / 2 TB / 432 GB
Enterprise	NetApp FAS6240	Up to 2,880	2 x 4 @ 2.53 E5540 / 96 GB / 6 TB / N/A	7720	Up to 720	4 x 8 @ 2.26 Xeon / 512 GB / 2 TB / 432 GB
Enterprise	NetApp FAS6280	Up to 2,880	2 x 6 @ 2.93 X5670 / 192 GB / 8 TB / N/A			

NetApp now bundles the first protocol option and most of their data services into the base FAS system. The following services remain as chargeable items: Additional storage protocols, SnapRestore®, SnapMirror®, SnapVault®, FlexClone®, SnapManager® Suite (includes:SnapManager for Microsoft® Exchange, SnapManager for Microsoft SQL Server®, SnapManager for Oracle®, SnapManager for Microsoft SharePoint® Server, SnapManager for SAP®, SnapManager for Virtual Infrastructure, SnapManager for Hyper-V™, SnapDrive® for UNIX®, SnapDrive for Windows®), NetApp Complete Bundle (includes all above Extended Value software), SnapLock® Compliance, SnapLock Enterprise

NetApp FAS Sales Tactics:

7000 Series storage can't function as a Fibre Channel target
7000 Series storage has limited scalability.
7000 Series storage cannot prioritise cache usage
7000 Series storage has a limited number of application plug-ins

7000 Series Counter Sales Tactics:

The7000 Series can function as a Fibre Channel target with the latest software release.
The latest version of Series 7420 can scale to 1.15PB, which is 95% of the FAS3240 scalability.
Hybrid Storage Pool is an integrated feature that automatically prioritizes cache usage, minimizing I/O through intelligent caching to flash and DRAM and moving data to disk in the background.
The latest 7000 Series software upgrades have two plug-in s that cover many workloads (Oracle Database Enterprise Manager 10g Grid Controller and Microsoft Volume Shadow Copy Support (VSS)). In addition

7000 Series Competitive Strengths:

DTrace: A unique feature of the 7000 Series that allows real-time and historical visibility throughout the entire data path with a unique user interface
Hybrid Storage Pool: Unmatched read and write Flash caches combined with large DRAM capacity allow HSP to move hot-data to the fastest place in the cache hierarchy
No Extra Cost For Data Services, Protocols, Plug-ins or OSes: Storage, plug-ins, data services, protocols and OS software costs bundled, no additional cost
SSD and DRAM Capacity: Larger caches at all levels allow fast write acknowledgements as data is written to flash and later streamed to disk and better HSP performance.
Less Complexity: One type of disk and RAID with large caches allow the 7000 Series to use higher capacity SAS-2 disks for greater utilization, less footprint and power

NetApp FAS /V-series Weaknesses:

WAFL has shown performance degradation as the arrays become more utilized. WAFL wants to write as much data as possible to the outer sections of the disk, but as the disk fills, performance drops as disk contention increases.

Series 7000 storage tends to have less disk contention problems as it is minimized through Hybrid Storage Pool caching. The 7420 has up to 512 GB of DRAM and up to 2TB of read flash and up to 1.7TB of write flash that allow faster acknowledgement of writes and the data is later streamed out to disk. The 2TB of read flash cache and 512 GB of DRAM allow HSP to cache more hot-data for delivery back to the host.

Limited performance and overall scalability of the WAFL and FAS series due to less CPU power Solaris/ZFS as a fundamental, multi-threaded, building block of Series 7000 storage improves performance and scalability. In addition, FAS 2020, 2040 and 2050 don't have the option of read or write flash cache, limiting caching options and increasing the likelihood of short stroking to increase performance and decreasing amount of high-IOP, available storage. FAS2XXX can't increase performance by adding flash; they get more IOPs by adding more disks.

DTrace provides real-time and historical analysis of the series 7000 storage and network from the storage sector up the stack to the clients requesting data. NetApp has no equivalent to DTrace instrumentation and monitoring.

NetApp FAS/V-series Competitive Strengths and Landmines and How to Counter

NetApp will say that the FAS lines scales higher than the equivalent 7000 Series. Counter: The current 7410 can scale up to 1.15PB of data, which compares quite favorably with the FAS32XX. The 7420 can scale to 1.15PB, which is 95% of the FAS3240.

NetApp will tell the customer that the FAS line has more application plug-ins than the 7000 Series: Counter: New plug-ins have been added for the Oracle database software environment and for the Microsoft VSS for Microsoft Exchange and Sharepoint environments. For other VMware environments, demonstrate the ease-of-use of the 7000 Series user interface, unmatched instrumentation of DTrace analytics and the performance improvements through HSP and the best practices white papers for 7000 Series for VMware.

NetApp will counter that their "unified storage" -both file and block—are more mature and capable of tier-1 storage. Counter: both the block and file based targets have been thoroughly tested by numerous customers in real-world situations.

NetApp will reiterate that the 7000 Series cannot be a block target to a FCH network. Counter: With the latest software release, the 7000 series can be a block target to a FCH network.

NetApp will say that the 7000 Series has no external SPECsfs benchmarks. Counter: SPECsfs diminishes the importance of large caches in storage systems and the caching hierarchy. In most cases, the benchmark, SPECsfs caches all the metadata, leaving the data on the disks. NetApp uses its fastest FCH disks at 15KRPM and too many of them. The SPECsfs workload is a much smaller than the Fibre Channel disk space allocated for it. NetApp short-strokes on as many outer-edge disks as possible, severely limiting overall storage utilization. In effect, this benchmarks come down to how many disks are used and how fast they are spinning. The benchmark workloads and system configurations are nothing like the actual storage workloads and system configurations that fully test the trade-off and design of a caching hierarchy.

NetApp will reiterate that 7000 series has no gateway capability. Emphasize to the customer that the 7000 series has no need for this capability because it is clearly less expensive (including disk, controller, protocol, storage services, application plug-ins and OS charges) that choosing all 7000 Series disks less expensive than keeping older non-Sun disk and a V-series NetApp gateway.

Price in US $

Need pricing information

Key Oracle Sun ZFS Storage 7000 Wins: For more info see Customers Page

i365, A Seagate Company
DigiTar

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