

Price and Performance Comparison for HDDs and HyperDrive4s and RAMSAN SSDs

For two good white papers on the advantages of SSDs over HDDs see...

www.texmemsys.com/files/f000173.pdf

www.texmemsys.com/files/f000174.pdf

Here is the comparison between a Western Digital Raptor Hard Disk, a HyperDrive4 and the entry level RAMSAN SSD by Texas Memory Systems...

Capability	WD740ADFD Raptor	HyperDrive4 revision3	RAMSAN 120
Sustained Transfer Rate	77 MB/s	120 MB/s	400 MB/s
IOPS 100% random 512Byte files	270	44,000	70,000
Access Time	8.4 milliseconds	1 microsecond	20 microseconds
Power Fail	Non volatile	Passive Autobackup to HDD	Active Autobackup to HDD
Battery Backup Length	Not needed	3 hours or 6 hours	30 mins?
ECC Data Scrubbing	No	No	Yes
IBM Chipkill Technology	No	No	Yes
Memory Capacity	36GB, 72GB	0GB - 16GB	8GB
Storage Medium	Rotating Glass Platter	Registered ECC DDR	Registered ECC SDR?
Expandable Capacity	No	Yes	No
Takes regular memory modules	No	Yes	No
Form Factor	3.5" Drive	5.25" CD Drive size	1U Rackmount
Power Consumption	13 Watts	13-15 Watts	250 Watts
Weight	0.7Kg	1.15 Kg or 1.3 Kg	20 Kg
Mechanical Failure?	Yes	No	No
Price	165,00 €	2.688,00 € (8GB), 3.598,00 € (16GB)	22,000,00 €

The 16GB HyperDrive4 is 160 x faster in IOPS than the Raptor and 22x more expensive. The 8GB RAMSAN 120 is 260 x faster in IOPS than the Raptor and 133x more expensive but only half the capacity of the HyperDrive4!

Here is the comparison between 4 RAID0 Raptors 4RAID0 HyperDrive4s and a RAMSAN 120. The RAID card used was a Silicon Image 3124-2 chip 4 port SATA RAID card with the latest SATARAID5 drivers from Sillion Image.

Capability	4x RAID0 WD740ADFD Raptor	4x RAID0 Sil3124-2 HyperDrive4 revision3	RAMSAN 120
Sustained Transfer Rate	230 MB/s	400 MB/s	400 MB/s
IOPS 100% random 512Byte files	500	73,250	70,000
Access Time	8.4 milliseconds	10 microseconds	20 microseconds
Power Fail	Non volatile	Passive Autobackup to HDD	Active Autobackup to HDD
Battery Backup Length	Not needed	6 hours	30 mins?
ECC Data Scrubbing	No	No	Yes
IBM Chipkill Technology	No	No	Yes
Memory Capacity	144GB, 288GB	0GB - 64GB	8GB
Storage Medium	Rotating Glass Platter	Registered ECC DDR	Registered ECC SDR?
Expandable Capacity	No	Yes	No
Takes regular memory modules	No	Yes	No
Form Factor	4x 3.5" Drives	4x 5.25" CD Drives	1U Rackmount
Power Consumption	52 Watts	52-60 Watts	250 Watts
Weight	2.8 Kg	5.2 Kg	20 Kg
Mechanical Failure	Yes	No	No
Price	165,00 €	8.398,50 € (8GB), 9.298,50 € (16GB), 11.098,50 € (32GB), 12.898,50 €(48GB), 14.698,50 € (64GB)	22,000.00 €

4 RAID0 HyperDrive4s outperform a RAMSAN 120 in speed and they cost half as much for twice the capacity!!
Here is the comparison between 32GB of HyperDrive4 storage in the form of 2 RAID0 HyperDrive4s and the RAMSAN 325C.

Capability	2x RAID0 Sil3124-2 HyperDrive4 revision3 fully populated	RAMSAN 325C max capacity
Sustained Transfer Rate	215 MB/s	1,500 MB/s
IOPS 100% random 512Byte files	74,650	250,000
Access Time	10 microseconds	15 microseconds
Power Fail	Passive Autobackup to HDD	Active Autobackup to HDD
Battery Backup Length	3 or 6 hours	30 mins?
ECC Data Scrubbing	No	Yes
IBM Chipkill Technology	No	Yes
Memory Capacity	32GB	32GB
Storage Medium	Registered ECC DDR	Registered ECC SDR?
Expandable Capacity	No	No
Takes regular memory modules	Yes	No
Form Factor	2x 5.25" CD Drives	3U Rackmount
Power Consumption	26-30 Watts	250 Watts
Weight	2.3 or 2.6 Kg	32 Kg
Mechanical Failure	No	No
Price	7.200,00 €	72.000,00 €

The RAMSAN is 3 x-7x faster and 10 x more expensive. If you need 32GB of lightening fast storage, at least an order of magnitude faster in IOPS than Hard disk arrays can manage, then 2 RAID0 HyperDrive4s is plainly the Value Solution.

Copyright HyperOs Systems London March 2007.