

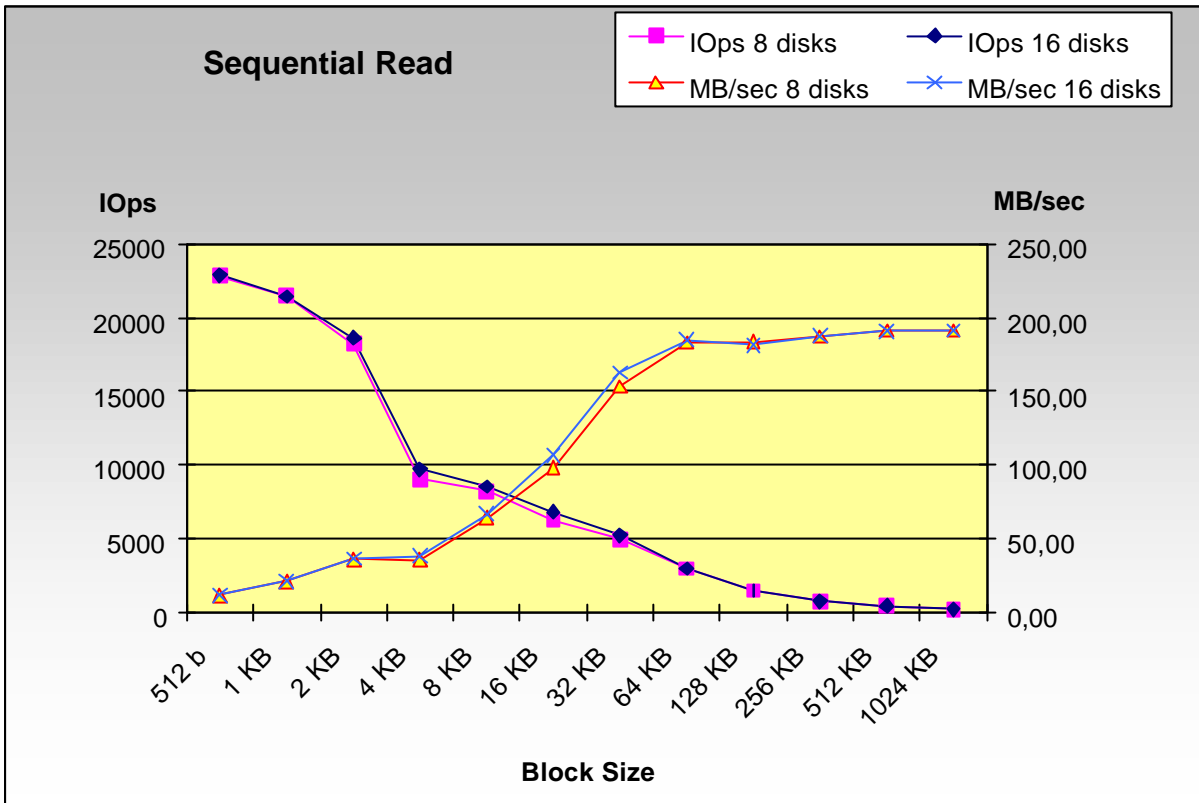


Performance Report EonStor ESA16F-U SATA to FC RAID

**Revision 1.1
02.09.2003**

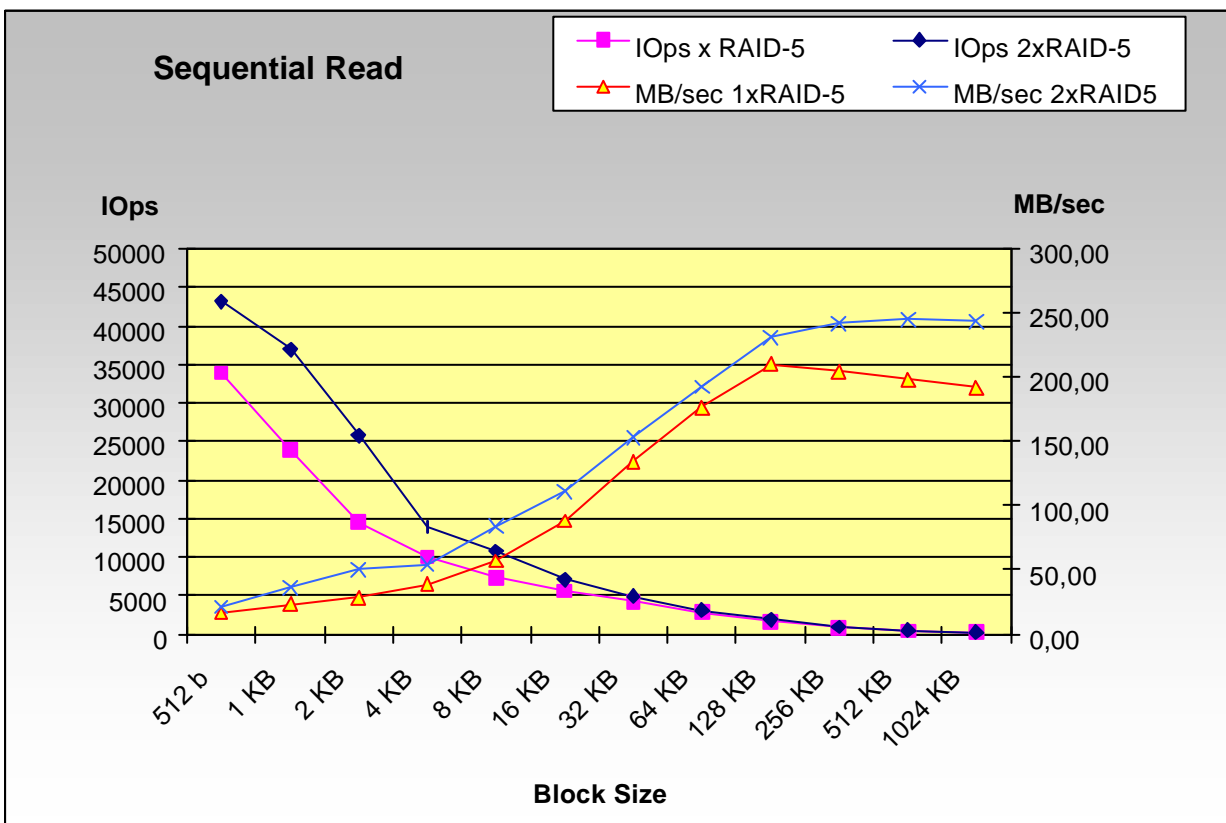
Heinex Data A/S

ESA16F-U Sequential Read – RAID-5



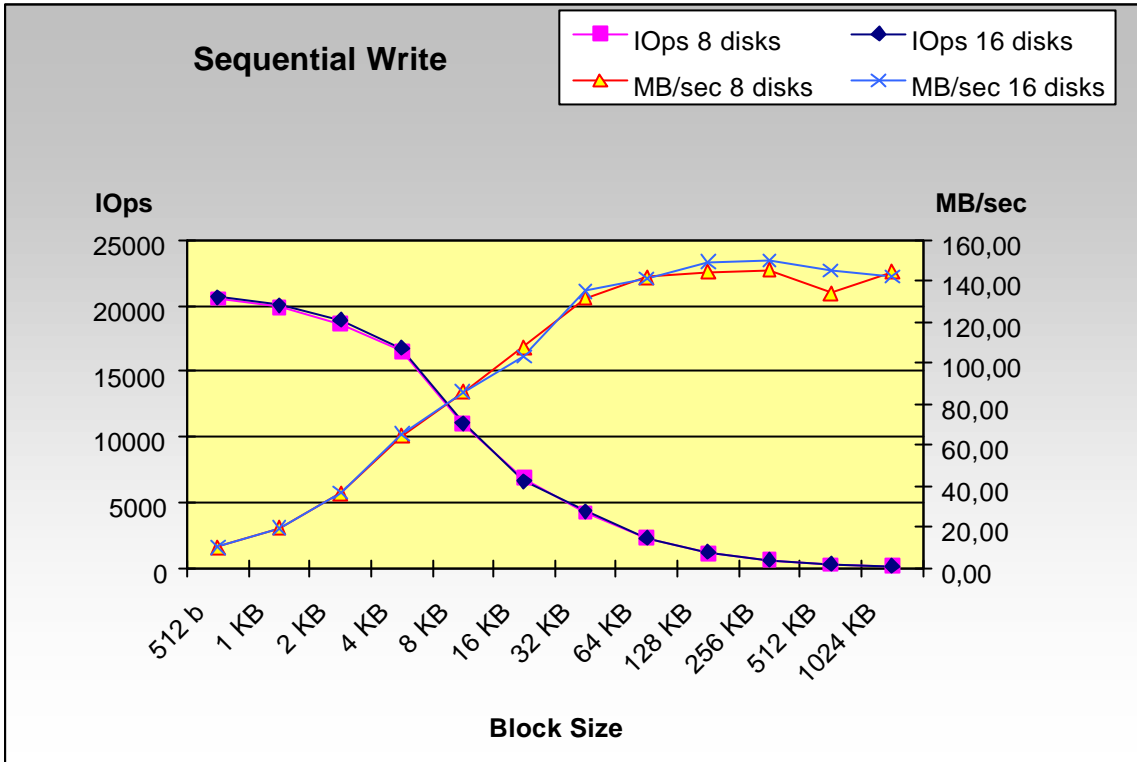
Sequential Read with 8 disk as 1xRAID-5 with 1 partition and 16 disks as 1xRAID-5. split up in two partitions to overcome the 2 TB. SCSI limit. 1 worker used in both tests. Only one partition are accessed in the 16 disk setup.

ESA16F-U Sequential Read – RAID-5



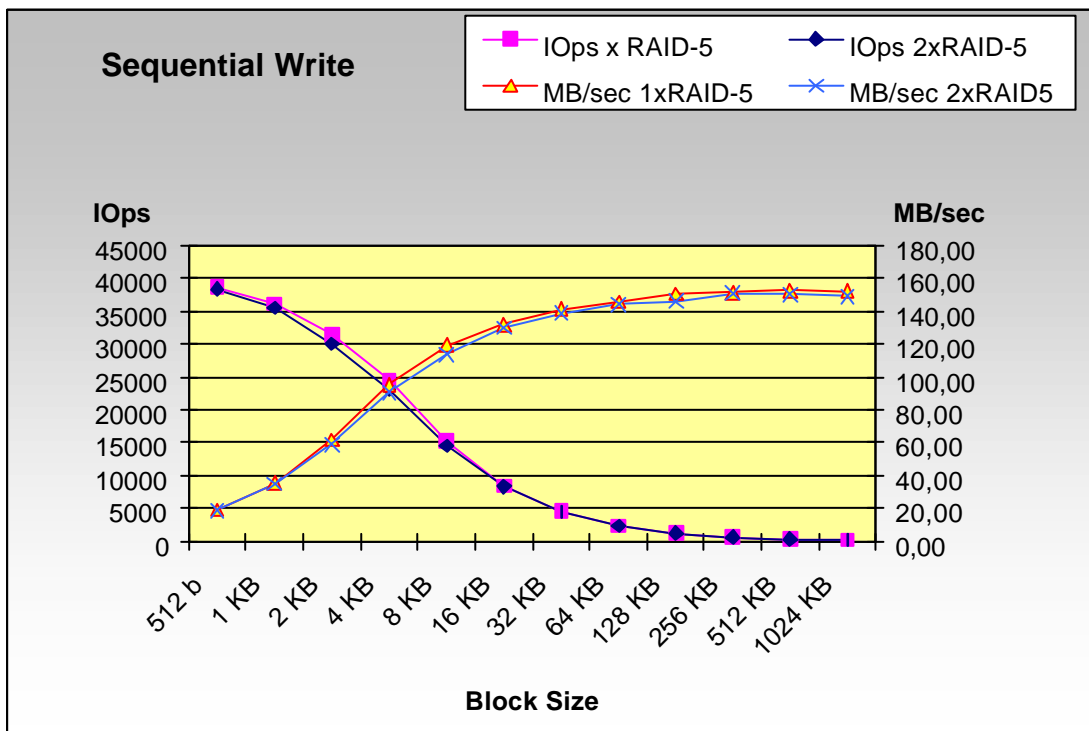
Sequential Read 16 disks. Comparing 1xRAID-5 with 2 partitions and 2xRAID-5 each with 1 partition. 2 workers and 2 HBA's – one for each partition/RAIDset. Partitions/RAIDsets mapped to different FC ports.

ESA16F-U Sequential Write – RAID-5



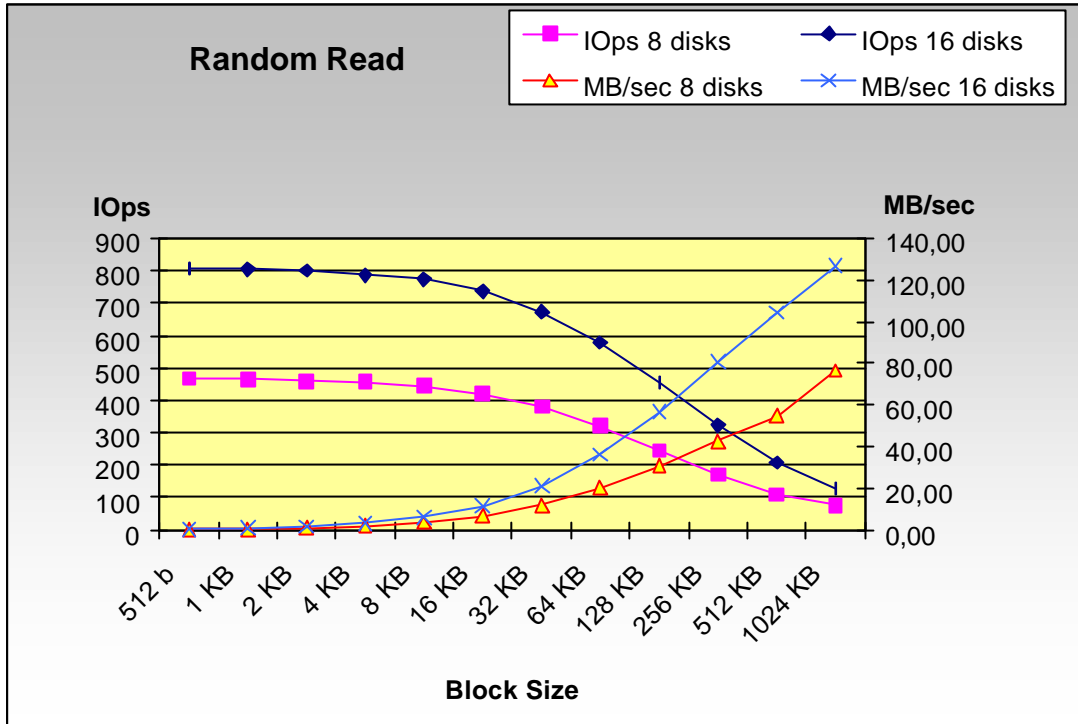
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ESA16F-U Sequential Write – RAID-5



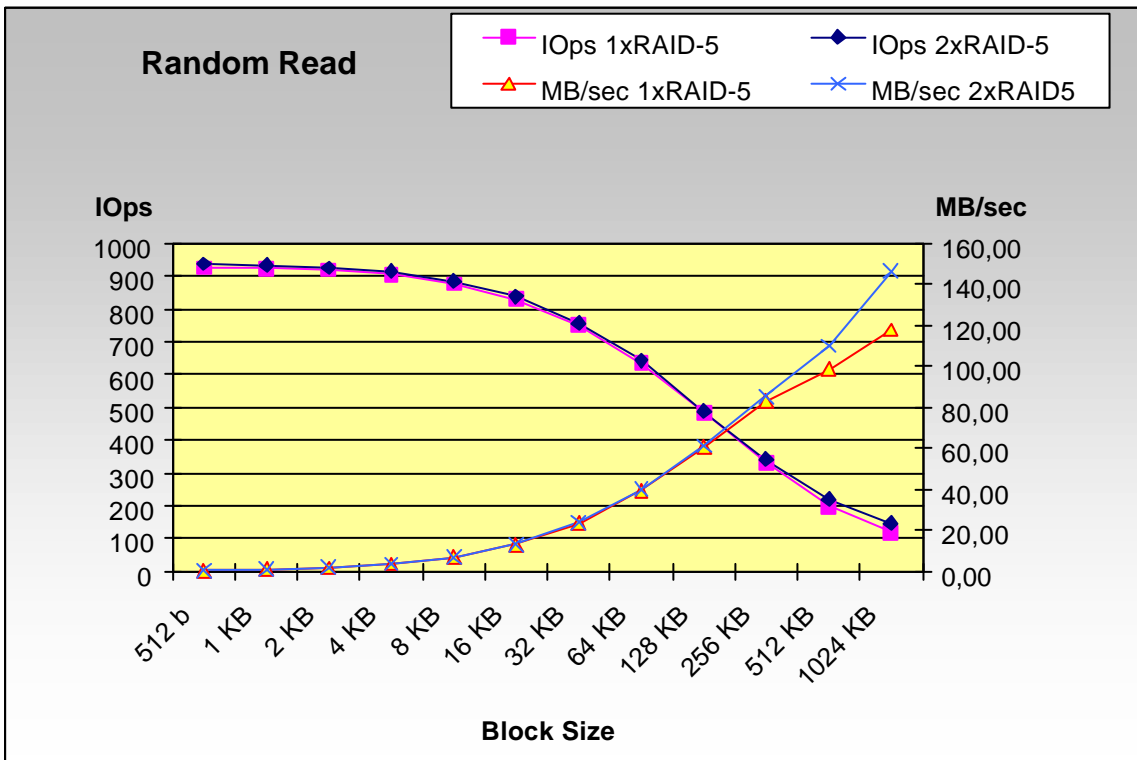
Sequential Write 16 disks. Comparing 1xRAID-5 with 2 partitions and 2xRAID-5 each with 1 partition. 2 workers and 2 HBA's – one for each partition/RAIDset. Partitions/RAIDsets mapped to different FC ports.

ESA16F-U Random Read – RAID-5



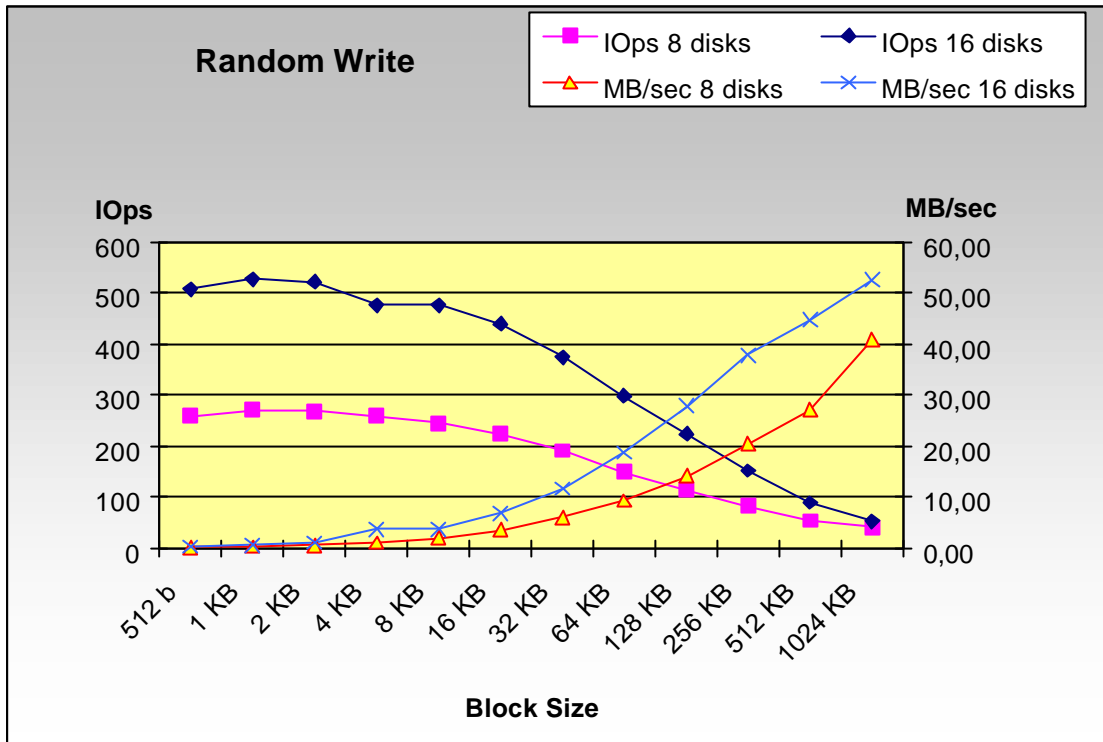
Sequential Read with 8 disk as 1xRAID-5 with 1 partition and 16 disks as 1xRAID-5, split up in two partitions to overcome the 2 TB, SCSI limit. 1 worker used in both tests. Only one partition are accessed in the 16 disk setup.

ESA16F-U Random Read – RAID-5



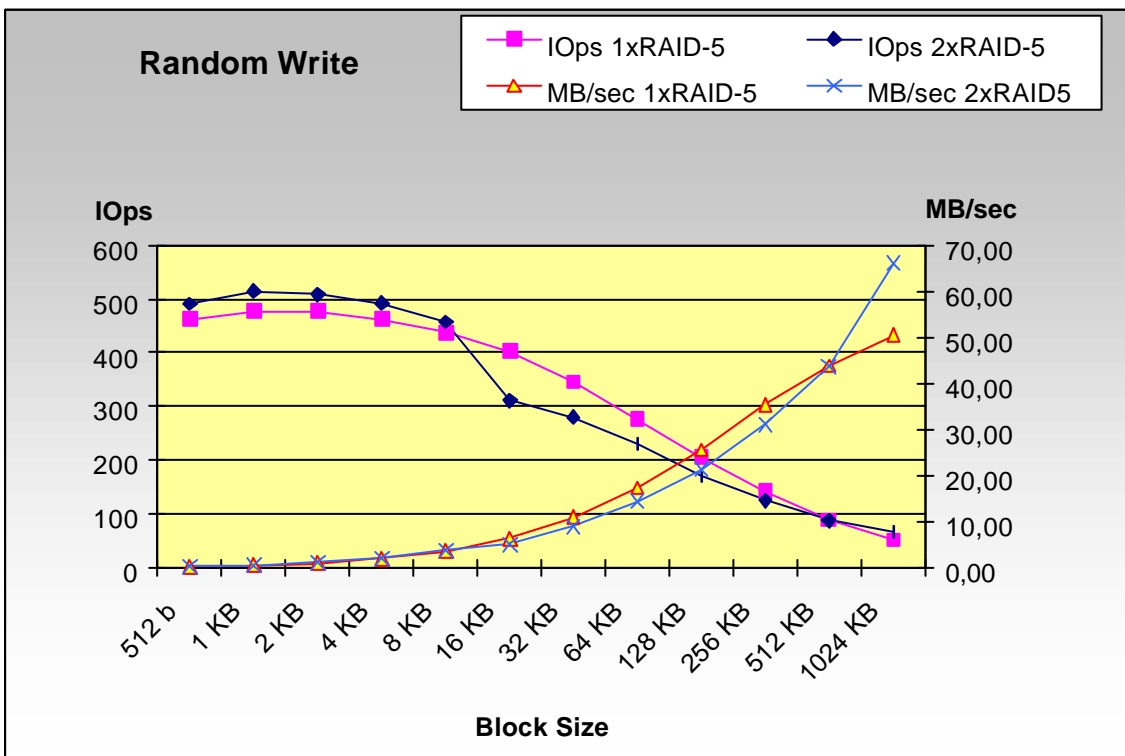
Random Read 16 disks. Comparing 1xRAID-5 with 2 partitions and 2xRAID-5 each with 1 partition. 2 workers and 2 HBA's – one for each partition/RAIDset. Partitions/RAIDsets mapped to different FC ports.

ESA16F-U Random Write – RAID-5



Random Write with 8 disk as 1xRAID-5 with 1 partition and 16 disks as 1xRAID-5. split up in two partitions to overcome the 2 TB. SCSI limit. 1 worker used in both tests. Only one partition are accessed in the 16 disk setup.

ESA16F-U Random Write – RAID-5



Random Write 16 disks. Comparing 1xRAID-5 with 2 partitions and 2xRAID-5 each with 1 partition. 2 workers and 2 HBA's – one for each partition/RAIDset. Partitions/RAIDsets mapped to different FC ports.



ESA16F-U FileServer Test – RAID-5

File-Server test are setup to simulate a typical Fileserver using 100 % random access. 80% read and 20% write. Disk access is mixed in blocksize – simultaneously access of 512 byte – 64 KB. blocks.

Block Size	% of total access
512	10
1024	5
2048	5
4096	60
8192	2
16384	4
32768	4
65536	10

Test setup	Total Iops	Total MB/sec.
1xRAID-5, 8 disks, 1 partition, 1 worker	402	4,32
1xRAID-5, 16 disks, 2 partitions mapped to 1 SCSI port, 1 worker	569	6,16
1xRAID-5, 16 disks, 2 partitions mapped to 2 SCSI ports connected to 2 individual HBA's. 2 workers, one for each HBA.	565	6,14
2xRAID-5, 12 disks, 2 RAIDset mapped to 2 SCSI ports connected to 2 individual HBA's. 2 workers, one for each HBA.	706	6,06

ESA16F-U WebServer Test – RAID-5

WebServer test are setup to simulate a typical webServer access using 100 % random access. 100% read. Disk access is mixed in blocksize – simultaneously access of 512 byte – 512 KB. blocks.

Block Size	% of total access
512	22
1024	15
2048	8
4096	23
8192	15
16384	2
32768	6
65536	7
131072	1
524288	1

Test setup	Total Iops	Total MB/sec.
1xRAID-5, 8 disks, 1 partition, 1 worker	407	6,25
1xRAID-5, 16 disks, 2 partitions mapped to 1 SCSI port, 1 worker	600	9,22
1xRAID-5, 16 disks, 2 partitions mapped to 2 SCSI ports connected to 2 individual HBA's. 2 workers, one for each HBA.	600	9,24
2xRAID-5, 16 disks, 2 RAIDset mapped to 2 SCSI ports connected to 2 individual HBA's. 2 workers, one for each HBA.	832	12,68



System test environment

Host system: Dual processor Xeon 2,4 Ghz. 2x64 bit PCI busses, 100 Mhz. 512 MB. memory. Emulex LP9002L 2 Gbit FibreChannel HBA's. Win2000

Intel Iometer utility was used to derive the performance data in this report. The basic utility setup for the measurement is described below.

Version 2003.02.15

- Single worker, where nothing else is mentioned.
- Max disk size = 0
- Start sector = 0
- No. of outstanding I/O's = 16
- Ramp up time = 5 sec.
- Test time: sequential tests 30 sec. Random tests 1 min. (pr. block size) File and Web Server test 3 min.

Raid system	EonStor ESA16F-U
Cache	128 MB.