







Performance

The performance/benchmark was made by IOzone ver.3.283 (<http://www.iozone.org/>) compiled from sources using Apple Xcode 2.4.1 (gcc version 4.0.1, build 5363) on the following PC configuration: Mac Mini 1.1, Intel Core Duo 1.66GHz FSB 667, 512MB RAM, HDD: Fujitsu MHV2060BHPL 60GB.

Performance comparison table

Test	File Size	Record Size	Native Apple HFS+ Driver (KB/Sec) 	Native Mac OS X NTFS Driver (KB/Sec) 	Paragon NTFS for Mac OS X (KB/Sec) 	Paragon vs HFS+	Paragon vs Native NTFS
Writer	1 KB	32 B	442150 KB/Sec	-	580494 KB/Sec	+	-
		512 B	702847 KB/Sec	-	851195 KB/Sec	+	-
	1 MB	32 B	32571 KB/Sec	-	29353 KB/Sec	=	-
		512 B	34448 KB/Sec	-	30305 KB/Sec	=	-
		4 KB	34500 KB/Sec	-	27096 KB/Sec	=	-
Re-Writer	1 KB	16 KB	33119 KB/Sec	-	27528 KB/Sec	=	-
		32 B	1376677 KB/Sec	-	1350701 KB/Sec	=	-
	1 MB	512 B	1769073 KB/Sec	-	1430318 KB/Sec	-	-
		32 B	33900 KB/Sec	-	29167 KB/Sec	=	-
		512 B	34023 KB/Sec	-	29019 KB/Sec	=	-
Reader	1 KB	4 KB	34041 KB/Sec	-	27490 KB/Sec	-	-
		16 KB	33199 KB/Sec	-	26262 KB/Sec	-	-
Reader	1 KB	32 B	1410588 KB/Sec	1251810 KB/Sec	1265904 KB/Sec	-	=
		512 B	1780809 KB/Sec	1811318 KB/Sec	1706515 KB/Sec	=	=

Test	File Size	Record Size	Native Apple HFS+ Driver (KB/Sec) 	Native Mac OS X NTFS Driver (KB/Sec) 	Paragon NTFS for Mac OS X (KB/Sec) 	Paragon vs HFS+	Paragon vs Native NTFS
	1 MB	32 B	1389076 KB/Sec	1251132 KB/Sec	1248156 KB/Sec	-	=
		512 B	1498306 KB/Sec	1492467 KB/Sec	1481933 KB/Sec	=	=
		4 KB	938914 KB/Sec	929311 KB/Sec	939620 KB/Sec	=	=
		16 KB	916296 KB/Sec	921233 KB/Sec	920907 KB/Sec	=	=
Re-Reader	1 KB	32 B	1645703 KB/Sec	1478763 KB/Sec	1477555 KB/Sec	=	=
		512 B	2052253 KB/Sec	1932454 KB/Sec	1919562 KB/Sec	=	=
	1 MB	32 B	1409846 KB/Sec	1257433 KB/Sec	1259732 KB/Sec	=	=
		512 B	1537377 KB/Sec	1507331 KB/Sec	1517598 KB/Sec	=	=
Random Read	1 KB	32 B	1508167 KB/Sec	1294431 KB/Sec	1289467 KB/Sec	-	=
		512 B	1695735 KB/Sec	2134992 KB/Sec	2133821 KB/Sec	+	=
	1 MB	32 B	1232886 KB/Sec	1112319 KB/Sec	1120202 KB/Sec	=	=
		512 B	1481223 KB/Sec	1461104 KB/Sec	1445062 KB/Sec	=	=
Random Write	1 KB	32 B	1370965 KB/Sec	-	1074599 KB/Sec	-	-
		512 B	1592612 KB/Sec	-	2290886 KB/Sec	+	-
	1 MB	32 B	1081183 KB/Sec	-	993038 KB/Sec	=	-
		512 B	1039478 KB/Sec	-	1033863 KB/Sec	=	-
		4 KB	270290 KB/Sec	-	42269 KB/Sec	-	-
		16 KB	897344 KB/Sec	-	897408 KB/Sec	=	-



Storage Lifecycle Management Solutions

Paragon Technologie GmbH - Systemprogrammierung
Heinrich-von-Stephan-Str. 5c | 79100 Freiburg | Germany
Tel. +49 (0) 761 59018 - 201 | Fax +49 (0) 761 59018 - 130

sales@paragon-software.com
www.paragon-software.com

Definitions of these tests:

File size: Size of a file that was used to measure the performance.

Record size: buffer size for sending/receiving data to file system functions.

Write: This test measures the performance of writing a new file and its metadata.

Re-write: This test measures the performance of writing a file that already exists. When a file is written that already exists the work required is less as the metadata already exists.

Read: This test measures the performance of reading an existing file.

Re-Read: This test measures the performance of reading a file that was recently read. It is normal for the performance to be higher as the operating system generally maintains a cache of the data for files that were recently read. This cache can be used to satisfy reads and improves the performance.

Random Read: This test measures the performance of reading a file with accesses being made to random locations within the file. The performance of a system under this type of activity can be impacted by several factors such as: Size of operating system's cache, number of disks, seek latencies, and others.

Random Write: This test measures the performance of writing a file with accesses being made to random locations within the file. Again the performance of a system under this type of activity can be impacted by several factors such as: Size of operating system's cache, number of disks, seek latencies, and others.



Storage Lifecycle Management Solutions

Paragon Technologie GmbH - Systemprogrammierung
Heinrich-von-Stephan-Str. 5c | 79100 Freiburg| Germany
Tel. +49 (0) 761 59018 - 201 | Fax +49 (0) 761 59018 - 130

sales@paragon-software.com
www.paragon-software.com

Results:

Paragon NTFS for Mac OS X has the same performance as the native (read only) NTFS driver for all read operations. As regards the native Apple HFS+ driver, Paragon NTFS for Mac OS X has also almost the same performance, in some cases we are better in some we are not. For detailed information see the performance comparison table, where:

+	- means Paragon NTFS for Mac OS X has better performance;
+++	- has much better performance;
=	- has almost equal performance;
-	- has worse performance;
-	- function is not available.

Note: The driver is NOT optimized yet. We are going to improve it further.