



Autodesk® Toxik™ 2009

FUSION-IO test case



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GOAL

These tests were devised in order to benchmark the IO-Drive performance versus a single system drive as well as a 4 drive RAID. The second test is a real-world case study of a stereoscopic production workflow in order to evaluate how the IO-Drive would perform in highly demanding production case.

TEST SYSTEM

- HP xw8600
- Dual - Intel Xeon Quad-Core processor
- 8gb RAM
- nVidia Quadro FX4700
- Single system drive 7200rpm
- 4 drive raid (7200rpm WD connected to SATA LSI controller, software raid in linux)
- Fusion-IO - 80gb IO drive
- Linux Red Hat Enterprise 5.2
- Eizo (main monitor running at 1920x1200)
- Hyundai (stereoscopic monitor running at 1920x1080)

All Hard-drives and IO-drive are configured to use EXT3 file system.

TEST 1: BENCHMARK COMPARISON

PROCEDURE:

In this test the toxik media-cache is set to the single system drive, the benchmarks are run, then we set the media-cache to the 4 drive raid, repeat the tests and finally run them once more using the fusion-IO card for the media cache. The media-cache location is configured by editing the toxik.ini file.

The benchmark consists of a checker board generator connected to an output node. The output node is cycled from **1920x1080 8bit RGB up to 2048x1556 32bit RGBA**. For each resolution a full resolution player is set to playback at 100fps. Once the content is cached and playing from the media cache, the playback



FPS is noted (once all writing is over and we obtain pure playback speed). The results of these tests in the table below.

RESULTS

The following table represents the results of the benchmark. Values in **RED** indicate that the playback performance was real-time (24 fps) or better.

Size	depth	Channels	Single Drive FPS	4 Drive FPS	IO-Drive FPS
1920x1080	8bit	RGB	7	17	60+
1920x1080	8bit	RGBA	6	13	60+
1920x1080	16bit	RGB	4	9	55
1920x1080	16bit	RGBA	3	6.5	40
1920x1080	32bit	RGB	2	5	27
1920x1080	32bit	RGBA	1	3.5	19
2048x1080	8bit	RGB	4.8	11	60+
2048x1080	8bit	RGBA	3.6	9	54
2048x1080	16bit	RGB	2.7	6	37
2048x1080	16bit	RGBA	2	4.5	28
2048x1080	32bit	RGB	1.3	3.2	18
2048x1080	32bit	RGBA	0.7	3	13

CONCLUSION

The benchmark is very clear that the Fusion-IO card provides much more throughput performance than the two alternatives tested above (the most classic setups). The fusion-IO card coupled with Toxics scalable architecture can provide for a great real-time experience.

TEST 2: STEREOSCOPIC WORKFLOW

PROCEDURE:

The test system was setup to output the Toxik User Interface on the main monitor (Eizo running at 1920x1200) and also feed a stereoscopic output on the second DVI port (Hyundai monitor running at 1920x1080) using the segmented frame quadbuffer mode (nVidia).



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The test entails having two players in the User Interface, the left player set to the composition bit depth and the right player set to 8bit and its result displaying on the stereoscopic monitor.

The players are then started. Once the results were cached into the IO-drive, the speed of the playback was monitored.

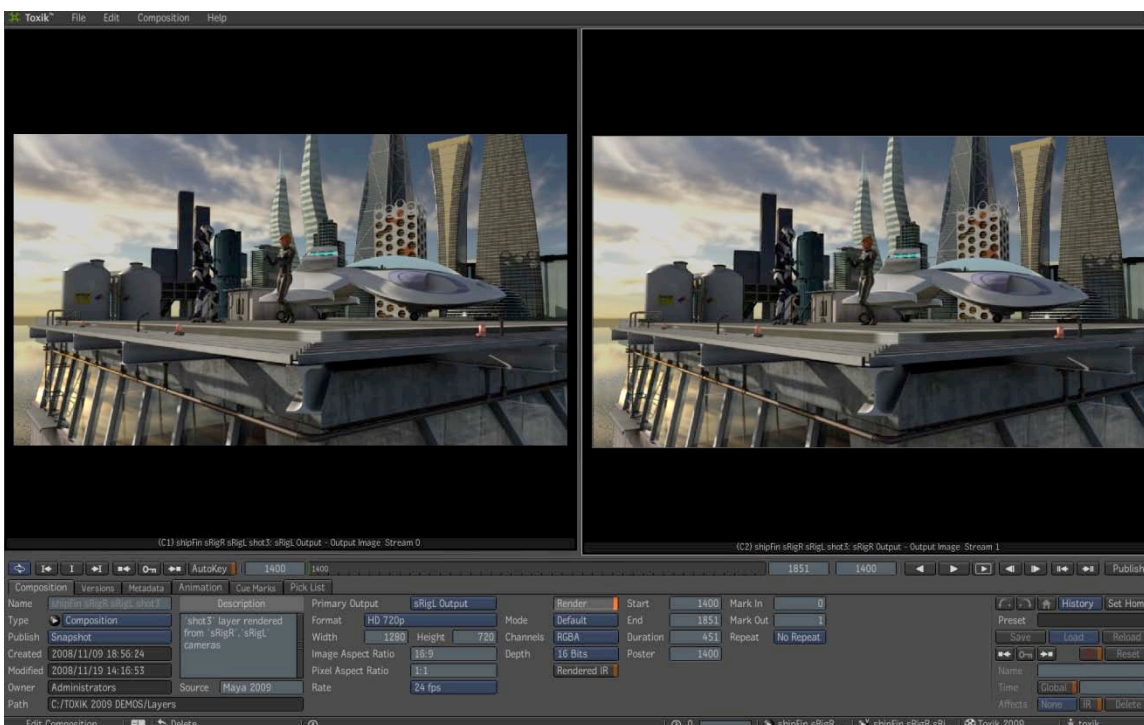


Image above: Left viewport is the result in full bit depth, right viewport is the stereoscopic stream in 8 bit (also displayed in stereoscopic on the second monitor)

RESULTS:

The table below depicts the composition size, bit depth and number of channels being processed. The resulting FPS is in the final column.

Size	depth	Channels	1 or 2 players	FPS
1280x720	8bit	RGBA	one player (with stereoscopic output)	60
1280x720	16bit	RGBA	one player no stereoscopic	60
1280x720	16bit	RGBA	one player 8bit (with stereoscopic output)	60



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1280x720	16bit	RGBA	two players no stereoscopic	60
1280x720	16bit	RGBA	two players (with stereoscopic output)	60
1280x720	32bit	RGBA	one player no stereoscopic	60
1280x720	32bit	RGBA	one player 8bit (with stereoscopic output)	60
1280x720	32bit	RGBA	two players no stereoscopic	42
1280x720	32bit	RGBA	two players (with stereoscopic output)	36
1920x1080	8bit	RGBA	one player (with stereoscopic output)	30
1920x1080	16bit	RGBA	one player no stereoscopic	60
1920x1080	16bit	RGBA	one player 8bit (with stereoscopic output)	30
1920x1080	16bit	RGBA	two players no stereoscopic	32
1920x1080	16bit	RGBA	two players (with stereoscopic output)	24
1920x1080	32bit	RGBA	one player no stereoscopic	25
1920x1080	32bit	RGBA	one player 8bit (with stereoscopic output)	29
1920x1080	32bit	RGBA	two players no stereoscopic	19
1920x1080	32bit	RGBA	two players (with stereoscopic output)	16
2048x1556	8bit	RGBA	one player (with stereoscopic output)	30
2048x1556	16bit	RGBA	one player no stereoscopic	32
2048x1556	16bit	RGBA	one player 8bit (with stereoscopic output)	30
2048x1556	16bit	RGBA	two players no stereoscopic	21
2048x1556	16bit	RGBA	two players (with stereoscopic output)	16
2048x1556	32bit	RGBA	one player no stereoscopic	16
2048x1556	32bit	RGBA	one player 8bit (with stereoscopic output)	30
2048x1556	32bit	RGBA	two players no stereoscopic	12
2048x1556	32bit	RGBA	two players (with stereoscopic output)	10
In 4K the results are the same because Toxik does and auto-proxy down to 1/2 resolution because 4K does not fit in the monitor				
4096x3112	8bit	RGBA	one player (with stereoscopic output)	30
4096x3112	16bit	RGBA	one player no stereoscopic	32
4096x3112	16bit	RGBA	one player 8bit (with stereoscopic output)	30
4096x3112	16bit	RGBA	two players no stereoscopic	21
4096x3112	16bit	RGBA	two players (with stereoscopic output)	16



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4096x3112	32bit	RGBA	one player no stereoscopic	16
4096x3112	32bit	RGBA	one player 8bit (with stereoscopic output)	30
4096x3112	32bit	RGBA	two players no stereoscopic	12
4096x3112	32bit	RGBA	two players (with stereoscopic output)	10

CONCLUSION

In this “typical” scenario we see that a workstation equipped with an IO-Drive and toxik can provide an interactive stereoscopic working environment for compositing, not only playback.