

Benchmarking: AMD64 in 32bit mode vs 64bit mode

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There are lots of discussions about the performance of the 64bit software. It is known that most of 64bit software should use more memory, should have larger (?) code size etc.. However I haven't found in the Internet any reasonable comparisons. Most of them were related to Windows XP 64bit edition that still comes with lots of 32bit software. So I decided to check the issue using pure 64 bit environment and software.

Environment

In order to do fair comparison two LiveCD's of the latest development release of Ubuntu Linux were used. Both have similar versions of the software compiled in 32 or 64 bit mode.

Tests

The following tests were performed:

1. **Audio processing:** converting audio track in wav format to mp3 with VBR settings (using lame encoder)
2. **Audio processing:** converting audio track in wav format to ogg vorbis (using oggenc – part of vorbis-tools)
3. **Image processing:** converting number of images applying on them despeckle, resizing them and then applying sharpening filters. (using ImageMagick)
4. **Mathematical operations:** generating random 50 matrices of 1000x1000, inverting them and multiplying all together. (using octave)
5. **Video processing:** converting video clip to mpeg4 using XVID encoder, applying, sharpening and median filters. (using AviDemux)

Hardware

AMD Athlon 64 3000+ Venice Core, 1GB RAM

Results

The following results were obtained:

<i>Software</i>	<i>i386 run time</i>	<i>amd64 run time</i>	<i>Gain</i>
Lame	1:03.4	1:05.6	97%
Ogg	0:33.6	0:23.6	142%
ImageMagick	0:31.8	0:15.5	205%
Octave	2:25	1:21	179%
AviDemux	8:45	7:18	120%

Conclusions

There are significant performance gain running heavy software. The average performance gain in these tests is about 150%