Client:	**Independent Benchmark Project**
Document:	**Benchmark Report**

Mac Pro Multi-Processing Benchmarks

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About This Benchmark Project

About this Benchmarking Project

Aim of the benchmark project

This independent benchmark project was conceived to measure the impact of multiple processing cores on the execution of single tasks, as well as on the productivity gains linked to tasks performed in parallel.

Methodology: Basics

Four different time-consuming tasks were selected. (See *Benchmarks Details* below). These tasks were first benchmarked individually, and subsequently in parallel, in sets of two, three and four parallel tasks.

Hardware

All benchmarks were conducted on a standard configuration 3.0GHz 8-core Mac Pro workstation equipped with 4GB of RAM.

Single, dual- and 4-core configurations were simulated by deactivating individual processor cores through software.

System software and configuration

The benchmark system was completely re-initialized prior to the benchmarks, using a standard installation of Mac OS X Tiger 10.4.9. No external hard drives or other peripherals were connected during benchmarks. System functions accessing the network were disabled.

Application software

The benchmarks were conducted using a default installation of the Adobe Creative Suite 3 as well as iMovie HD 6.0.3.

Benchmark details

Tasks and multi-processing sets

- **Individual tasks**

  The following processing-intensive tasks were selected for the benchmarks:

  1) InDesign CS2: Export of a PDF file from a complex page layout.

  2) Batch conversion of 40 high-resolution Raw files to DNG format using Bridge CS3 and Adobe Camera RAW

  3) Rendering of a Radial Blur filter (setting 89) on a 300MB file using Photoshop CS3

  4) Converting a DV file to QuickTime Movie format using iMovie HD.

- **Multi-processing set 1: Two Tasks**

  Task 1: PDF Export

  Task 2: Raw conversion

- **Multi-processing set 2: Three Tasks**

  Task 1: PDF Export

  Task 2: Raw conversion

  Task 3: Photoshop filter

- **Multi-processing set 2: Three Tasks**

  Task 1: PDF Export

  Task 2: Raw conversion

  Task 3: Photoshop filter

  Task 4: iMovie video conversion

Execution of benchmarks

- **Individual tasks**

  The predefined tasks were first benchmarked individually, using a single core, dual cores, four cores and all eight processor cores.

  The computer was restarted after each series of tests.

- **Multi-processing sets**

  For parallel execution of the tasks, multi-processing sets of two, three and four tasks were set up and initiated at the same time, measuring the time necessary to complete all tasks.

  Sets were executed using a single core, dual cores, 4 cores and 8 cores.

  The computer was restarted after each series of tests.

Key Results

Single Tasks

Some applications have been fine-tuned to benefit from multiple processors, and show clear performance increase when additional processor cores are available. This is the case of Photoshop: computing the Radial Blur filter took over 131 seconds with a single processor, and only 69 seconds with dual processors. 4 processors reduced the necessary time to 55 seconds, and the 8-core configuration completed the task in 45 seconds.

This is an ideal scenario, however: in other Photoshop benchmarks, the difference between 4-core and 8-core configuration was very slight (See also: *Photoshop CS3 Performance Benchmarks (Macintosh)*.

Other applications do not seem to use multiple processors at all: exporting the PDF file from InDesign CS3 took exactly the same time, whether one or more processors were available.

On average, however, even for single tasks, there is a clear performance difference between one and several processors.

Multiple tasks

Results for multiple tasks executed in parallel were revealing, underlining the efficiency of Mac OS X in spreading the overall processing load of a system over several processors: two tasks executed in parallel on the eight-core Mac Pro took only 6 seconds longer the the longest individual task. Three parallel tasks take one third of the time on the eight core system than with a single core.

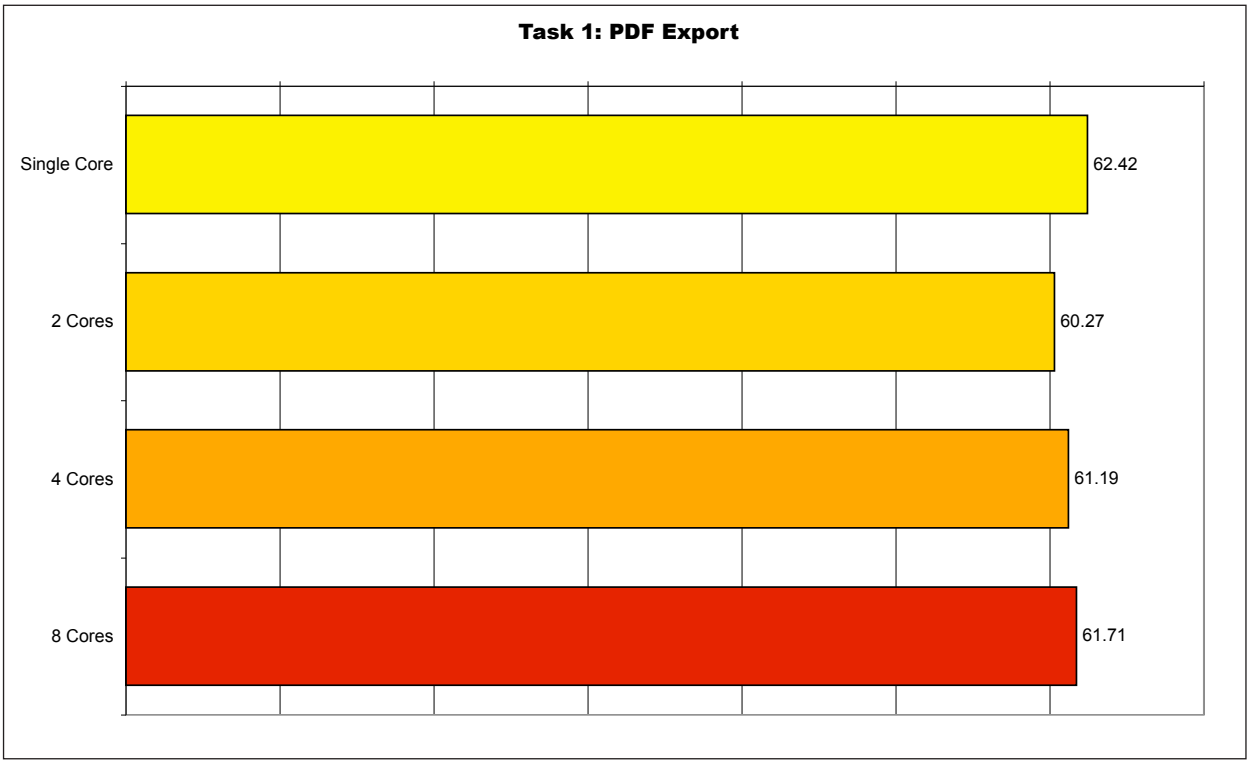
The most interesting aspect of the multi-processing benchmarks is that performance increases significantly each time more processors are added.

Conclusion

Multiple processing cores provide additional performance, particularly when running several tasks in parallel. From a practical perspective, this means that multiprocessing has become a reality even in high performance tasks, and could lead to streamlined workflows and significant changes in user behavior over time.

In other words, while eight processor cores may not provide a meaningful performance increase over a quad-core Mac Pro for Photoshop CS3, for instance, the performance difference for multiple tasks are significant. Given the processing requirements of the modern creative workflow, this is an important improvement: being able to use Photoshop at full speed at the same time as compressing a digital video file, or while converting hundreds of Raw images in the background can make a significant difference in a deadline-driven workflow situation.

Results and Charts



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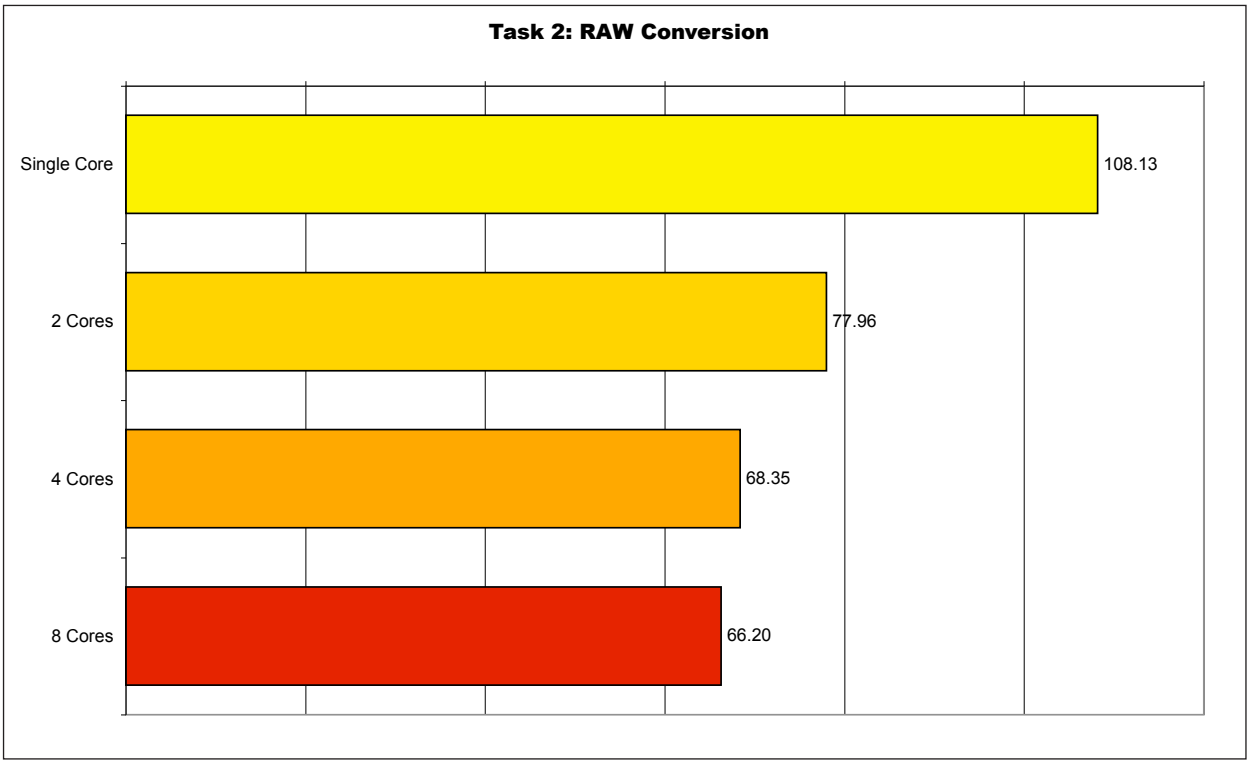

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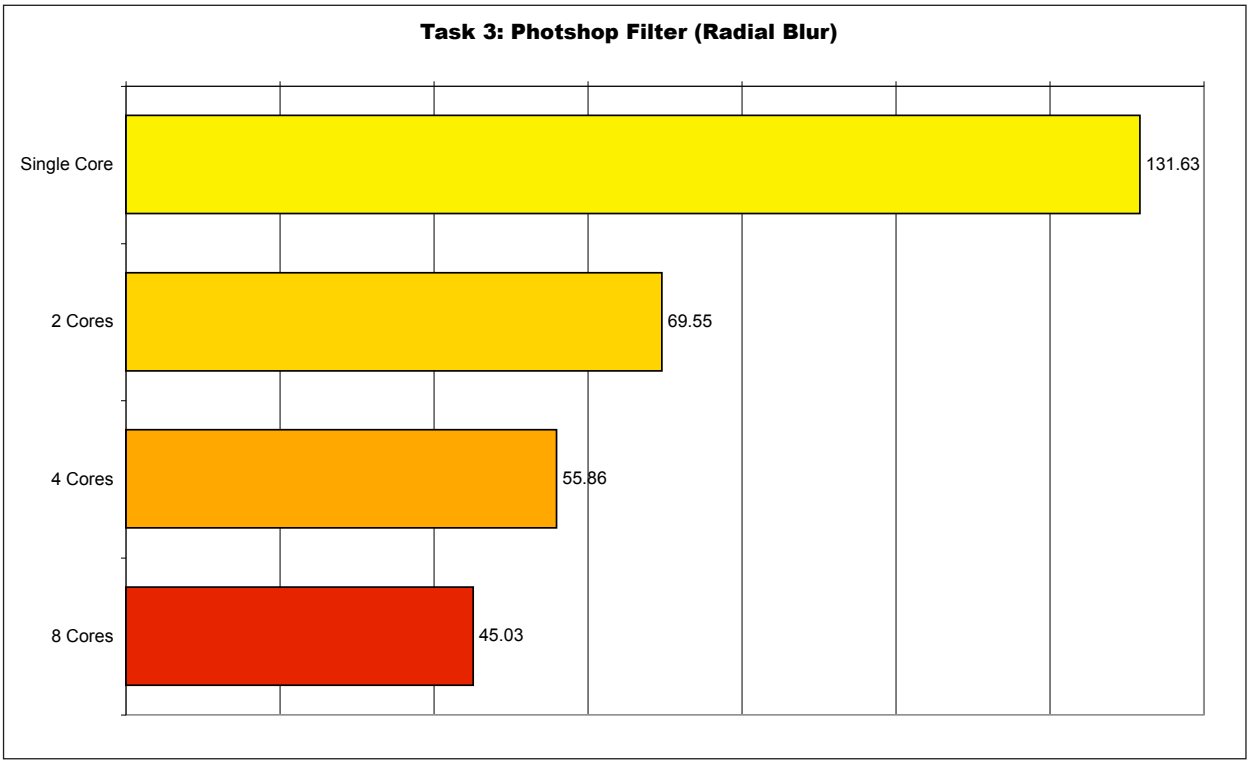

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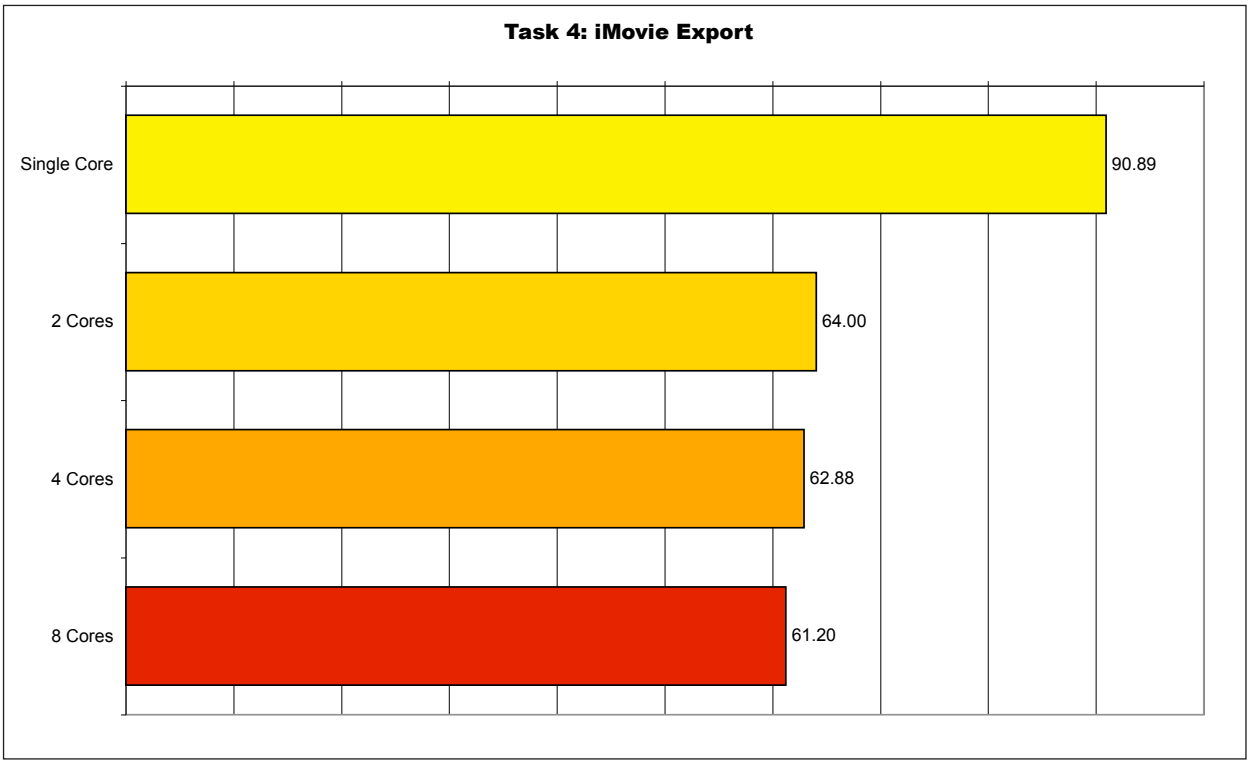

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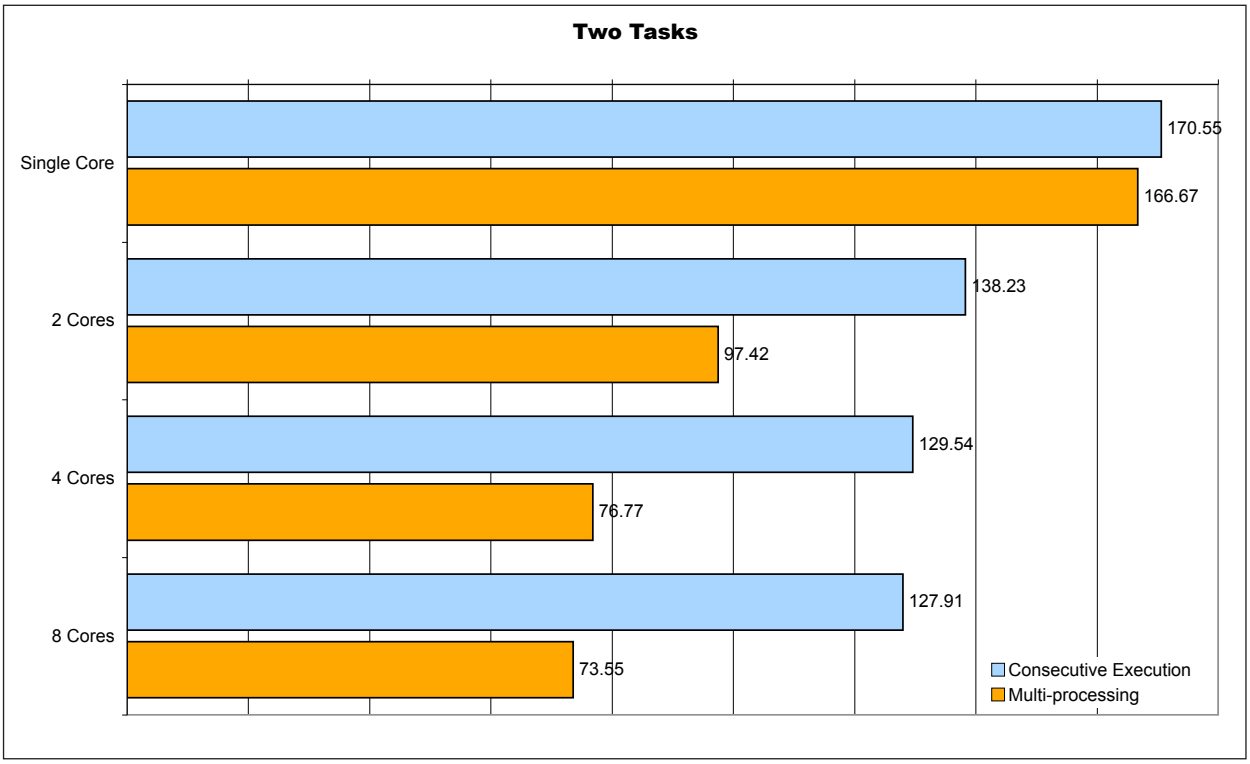

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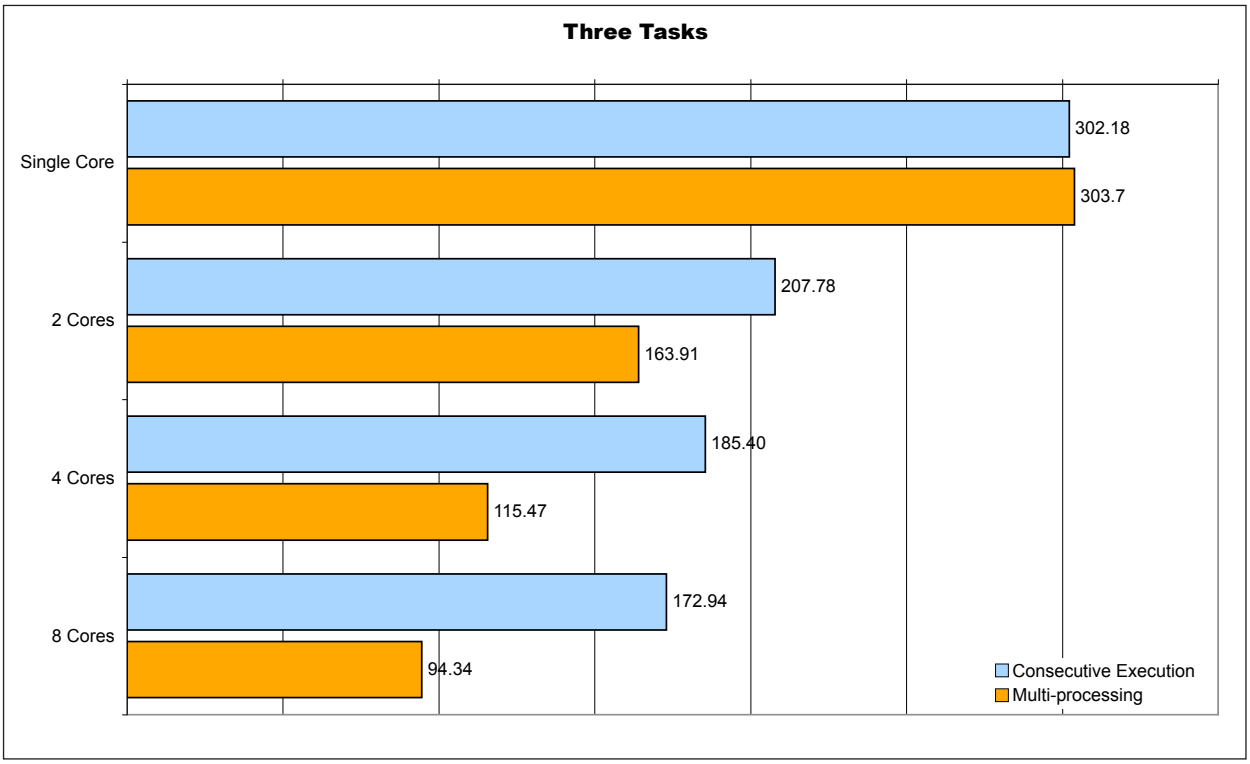

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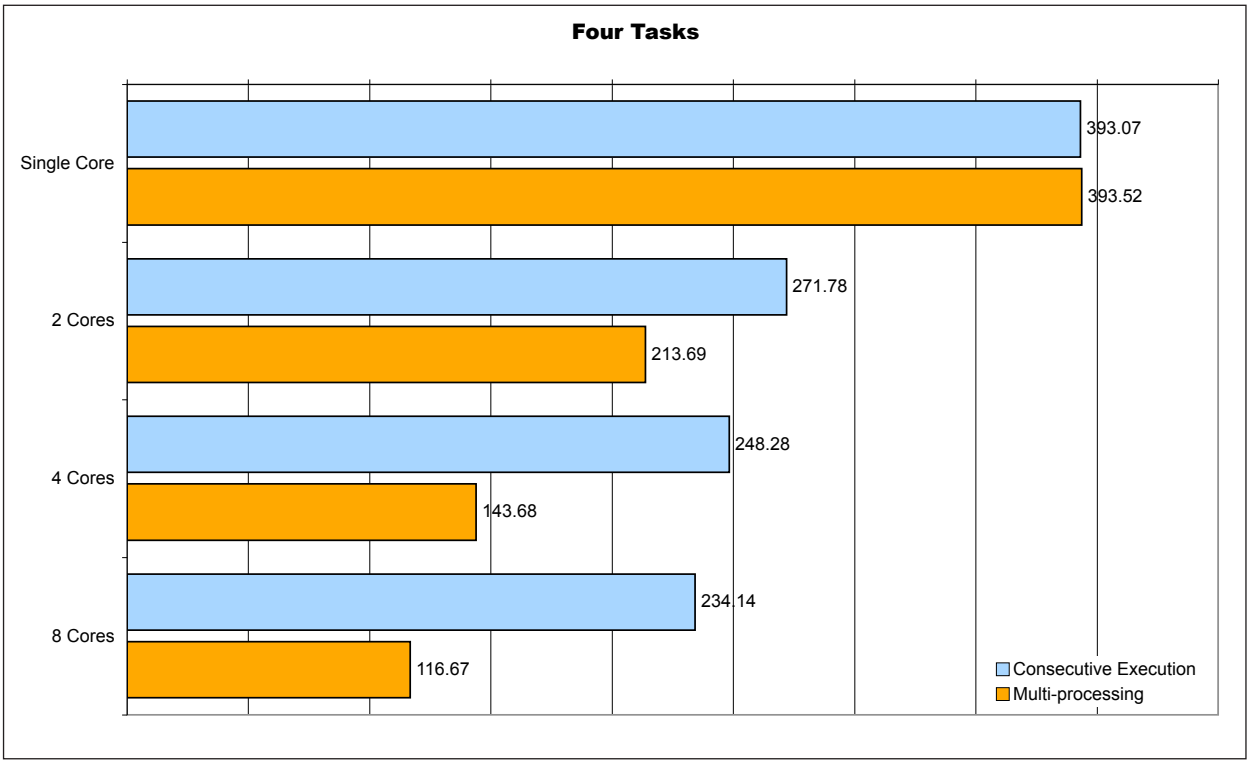

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