

Multi-Core CPU Based Smartphones: Are They Worth Buying?

After desktops, laptops and servers, multi-core CPUs are now powering the latest smartphones. But what exactly is a multi-core CPU? And does it really help to make your smartphone experience better? Read on...

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With Samsung releasing its new flagship model, the Galaxy SIII, with an Exynos quad-core processor, the bar for hardware has once again been raised. From single-core to dual-core to quad-core, the smartphone market evolves within the blink of an eye.

What's a Multi-Core CPU Doing in a Smartphone?

A core is simply a distinct processing unit within a CPU that performs computations and carries out machine instructions in a computer. The first wave of smartphones had a single core, which was more than sufficient to handle the applications in those days. However, with the burgeoning of CPU-intensive applications and multi-tasking, it has become imperative to improve the CPU in smartphones.

A single CPU has something called a "clock speed", which can be pushed to a certain limit, and this will increase the performance of the phone. However, after a certain threshold, the core will not be able to perform further, and pushing up the clock speed will also increase power consumption. To solve this conundrum, phone companies decided to follow the example in desktop computing, by adding more cores that will facilitate computation. Think of this analogy: if one man has to pull three cars at the same time, he will have to take a huge physical toil to perform the task. However, if there were two other men to help him, they could split up the work and finish it with more ease. This is exactly the same scenario in the case of a single-core vs quad-core comparison.

In the quad-core, four cores work in unison to perform separate tasks and complete them. In a single-core, the lonely core has to carry the whole load by itself. For example, many users multi-task on their phones nowadays; watching a video, listening to music and browsing the web all at the same time. When there are multiple cores in the phone, each core can dedicate itself to a certain task. Core A can process the video playback, while Core B can process the music while Core C can take care of the web

browser activity. In this way, none of the cores are pushed to their limit. Because they only perform at a fraction of their capacity, the overall power consumption of the phone comes down as well. Moreover, the user does not need to worry about how the multi-core system is working. The OS itself designates work to the cores according to many factors that optimize performance and battery life.

Cool! but what do I get out of it?

A. A multi-core CPU will deliver blazing performance when compared with a single-core CPU. Multiple apps will not tax the same core, but all processes running will be managed by the CPU expertly, distributing work between all the cores available. The drawback is that many apps are still not optimized for using multiple cores. The hardware and software are doing a rabbit vs. turtle race, and developers still need to get used to optimizing apps for multi-core.

B. Don't you hate it when your smartphone runs out of juice after just half a day? Well, with multi-core systems, that may be less of a problem. As there are more cores sharing the load of work in processing, the cores never work their socks off, and so the power consumed and heat generated by them is much lesser. For example, with the quad-core processor running on the Galaxy S3, it has been tested and lasts the whole day even when put through intensive multimedia usage, so that's saying something.

C. With graphics-intensive games like Infinity Blade and need for speed coming out on smartphones, a single-core will take a severe beating running such games. However, with multiple cores, developers can take advantage of multi-threading to optimize their games to run smoothly and push the limits of hardware even more.

D. The user interface will be extremely zippy and responsive on multi-core phones. While single-core phones may struggle to render complex widgets and such, multi-core phones will not even break stride in animations or real-time changes in the UI. This will be pleasing to the eye, and also less irritating to the user who is rushing through tasks on the phone.