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Trade Magazine Assignment

This month Apple will be doing a product release for their iPhone 1000. Just kidding it's the iPhone 8 but it feels like 1000, and the way the world loves Apple they will probably make 1000 more models, unless the world gets hit by an asteroid, or Samsung blows up every single Apple campus. All jokes aside, the iPhone 8 is upon us and that is what these articles are about. The only thing that interests me about this is that these phones are going to be using ARM's A11-series processors. Being that I love computer architecture and I have used and studied a few different ARM processors, I wanted to look deeper into this. I found a good article on Computer World titled, "6 things you need to know about Apple's A11 iPhone processor." One of the most notable changes from the A10 processor to the A11 processor listed in the article is the jump from 16 nanometer transistors to 10nm transistors. Moore's law continues to thrive, and this not only means they can pack more logic into a single chip but this is supposed to reduce power consumption. The article goes on to explain, "As well as a move to 10 nanometer process design, today's report claims the A11 is assembled using TSMC's FinFET (fin field-effect transistor) process 'packed with a wafer-level integrated fan-out' technology." I have never heard of FinFET, and the article didn't explain much from an engineering standpoint, however this new process is supposed to be able to deliver thinner chips that are at least 20 percent faster with better power dissipation. I do know that as

you go smaller with your transistor size and pack more and more logic into a tiny chip, you generate more heat and this is very problematic. So with a process that can reduce chip size and somehow simultaneously dissipate more power (thermal energy), you have struck gold. The article goes on to explain how the evolution of the ARM processor has continued to blow away its predecessor, so the A11 should be a significant improvement from the A10, which is already an amazing chip. Hopefully we see these chips move into other industries, because I hate to see Apple being the only company from benefitting from these improvements.

I found a good supporting product article titled, "iPhone 8", which as mentioned before is going to use the ARM A11 processor. The author suggested that the new phone is supposedly going to get rid of the Touch ID fingerprint scanner and start using facial recognition. No more being a crazy girlfriend and hacking into your boyfriends phone. Apple is getting rid of the home button, which allows them to increase the size of the screen without increasing the size of the actual phone. Another very interesting feature that the phone is supposed to support is induction-based wireless charging. Wireless charging is the future, and I expect to start seeing this in many battery powered portable consumer devices. Apparently Apple is moving back to the glass body like what was in the iPhone 4 as opposed to the aluminum body, and if you asked me why they made that decision I would most likely assume because they make great money off fixing broken phones. Shame on you Apple!

The iPhone 8 truly does not interest me what so ever. I have owned iPhones in the past and I currently own a MacBook Pro, but I no longer support Apple or

their products. However, I do support the new technologies that are going to be implemented on this device. The A11 processor sounds amazing. The wireless charging is a feature I have been expecting to see in all cell phones very shortly and I am glad to finally see more progress in this feature set. I predict almost all “mobile” devices will be completely wireless in the next ten years. The facial recognition feature is something we have been doing for sometime now, however it shows how advanced and awesome our firmware is. Facial recognition is very difficult to accomplish, and I respect the engineers that wrote the algorithms to accomplish this.

I found a decent business article about the A11 processor titled, “Apple’s A11 CPU Is Going To Leave 2017’s Android Flagships In The Dirt.” The article basically explains how Apple has and is going to continue to dominate the market and build better products than their largest competitor, Samsung. The article states, “Today’s average Android phone has 4GB–6GB of RAM, while the average iPhone has only 2GB.” This is an interesting statistic because memory latencies usually far surpass CPU latencies, and since most cell phones operate on RISC CPU’s, memory latencies are very important because we are constantly loading and storing to memory. Cache memory that is, but the second you evict a cache block you have to go to your secondary memory which is your RAM. Long story short, a device with 4-6GB of RAM should blow a device with 2GB of RAM out of the water. However, this is not the case when you compare performance between the Android and the iPhone. “Except for the OnePlus 5 with its massive 8GB of RAM “narrowly beat” the iPhone 7 Plus.” The difference in this specific test is that the iPhone 7 Plus had the A10 chip

and 2GB of RAM. The article goes on to say, “A leaker by the name of ‘Ice Universe’ has posted reported Apple A11 Geekbench 4 test results which show the iPhone 8’s A11 scored between 4300 and 4600 in single core testing, and between 7000 and 8500 in multi-core tests.” I realize these numbers probably mean nothing to the average reader, but to put this into perspective the Samsung Galaxy S8 single-core results were 1966. Thus making the A11 four times faster than Samsung’s current chip. The article also explains how the Samsung Galaxy S8 is the current leader among the long list of CPU’s found in Android phones.

This article is more proof that Apple unfortunately will continue to dominate the cell phone market. Luckily for me I will not be working for Apple, however I would not mind getting my hands on one of these A11 chips. With the performance stated in the previous articles, a processor with this power makes a firmware engineer’s life so much easier. As a firmware engineer we are always trying to make our software run as fast as possible and this is a big challenge. When new chips like this come out, it is important to look at the potential benefits and downfalls of using them in your companies products, because they allow you more flexibility with the software they run.

Sources

Leading edge technical article: “6 things you need to know about Apple’s A11 iPhone processor”, <https://www.computerworld.com/article/3184220/apple-ios/6-things-you-need-to-know-about-apples-a11-iphone-processor.html>

Product article: “iPhone 8”, <https://www.macrumors.com/roundup/iphone-8/>

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