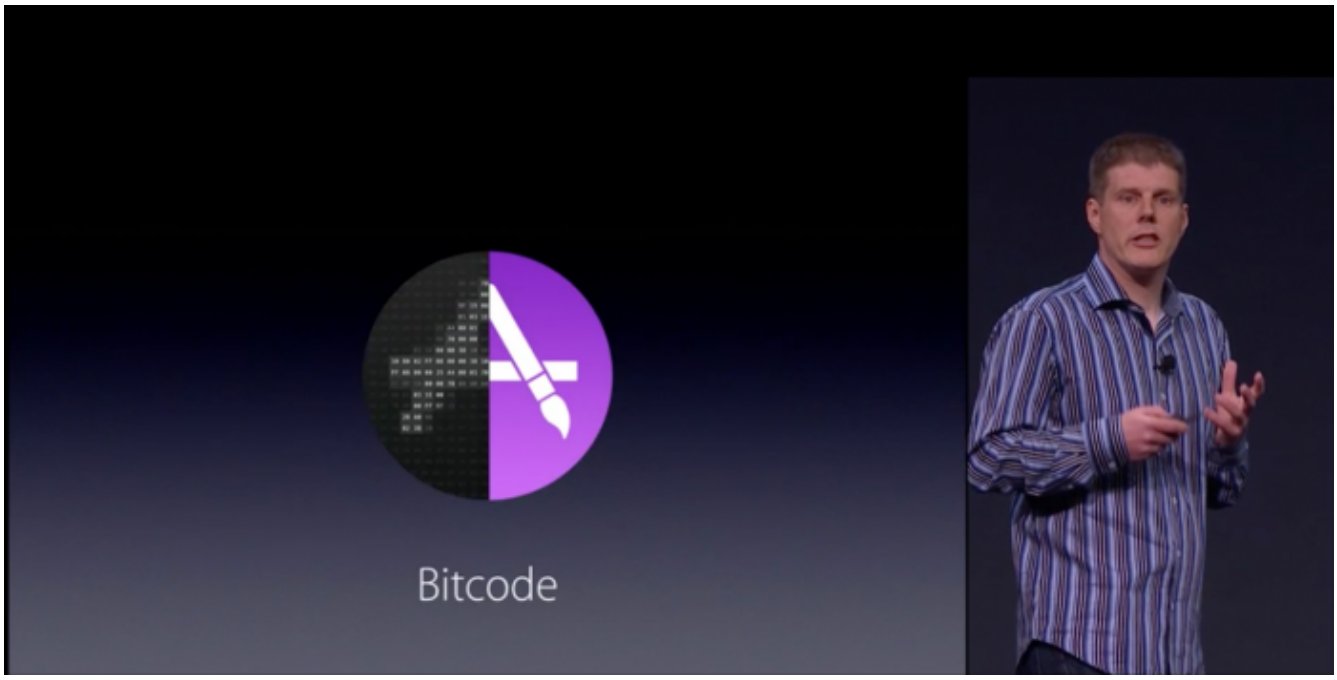
Apple’s Bitcode Technology Hints at the Future [updated 2X]

June 12, 2015

A little gem[1] from Apple’s WWDC “Platform State of the Union” session, introduced by Andreas Wendker:



Andreas Wendker, VP,OS X Platform, introducing Bitcode. (Source: Apple)

> We’re also working on a new technology that is very [much] forward-looking. We’re introducing Bitcode into the app submission process.
>
> Bitcode … allows the store to re-optimize your apps for each kind of device before they get delivered to the user. … The store will be in a position to constantly re apply the latest compiler optimizations that we’ve been working on. It also future proofs your apps, because **it will allow the store to take advantage of new processor capabilities we might be adding in the future**, and

> all that without you having to resubmit your apps to the store.

This is a strong hint that a future iPad may run on a different processor (e.g., an ARM CPU on the rumored iPad Pro). Or that a future Mac might use an ARM CPU (see this Tweet by John Siracusa[2]). SEE UPDATE 2, AT THE BOTTOM OF THIS POST.

Curiously, using Bitcode is *mandatory* on Apple Watch's watchOS. So then, why might Apple Watch apps ever need to target a new CPU? The most likely reason might be that the watch CPU could change. "Inertial Lemon" (actual name unknown) on Twitter and Medium speculates that possibility:

> Imagine that the chip designers know they can make the [Apple Watch's CPU] S2 leaps and bounds better, but doing so would require making some design changes radical enough that they broke existing software. Should Apple go the iPhone 1.0 route and hold back the SDK for another hardware generation, leaving third party developers in the cold? Could Apple get away with breaking the entire first generation of apps and forcing developers to resubmit to be compatible with the next generation of the Watch? What if there were some magical third option that didn't have any real downsides?

That third option, Inertial Lemon surmises, is Bitcode.

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1. Thanks to Dan Moren for citing it and for Leo Laporte for emphasizing its importance, on Leo's MacBreak Weekly. Highly recommended.

2. Thanks to "goatforce5″ for citing it, on a Hacker News forum.

Update 1 – June 13: I added the part about the Mac and the link to John Siracusa's Tweet. And I linked to the piece by "Inertial Lemon". I removed my initial speculation about Bitcode enabling apps (like games) to run on Apple TV, and also about Bitcode enabling watch complications to run on iOS. These latter notions are either unlikely (with regard to Apple TV) or perhaps incorrect (with regard to watch complications).

Update 2 – July 6: John Siracusa's perspective about Bitcode's relevance to ARM Macs has changed. It's simply intended, he believes, to allow developer apps to run even when there have been small changes to a processor's instructions. Here's John's perspective, from Episode 124 of Accidental Tech Podcast (highly recommended), the podcast he does with Marco Arment and Casey Liss:

> [Bitcode] doesn't help or hurt [portability across architectures]. [It's basically] orthogonal,… mostly having to do with taking advantage of new instructions and new processors, being able to remove instructions from processors when they're no longer needed, all without asking developers to re-upload new binary versions of their applications and recompile them for new architectures and stuff.

In general, I'm not seeing any more speculation that Bitcode, specifically, signals or enables a move to ARM.

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