# The coming of the eSIM

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The concept of the “embedded SIM,” “eSIM” or “Virtual SIM” card for mobile devices has been around for a few years now, but it is still new, since even the terminology is not yet well defined. Apple filed the initial patent (http://www.patentlyapple.com/patently-apple/2011/11/apple-introduces-us-to-the-virtual-sim-card.html) for its version, the “Virtual SIM” or “Apple SIM,” back in 2011 and has been building on the design ever since.

The idea behind an eSIM is that it is embedded as a chip within the device hardware rather than being a removable card. This allows users to avoid locking themselves into a plan with a single operator, or to switch operators without having to unlock or buy a new device. The long-term idea is to create an industry standard eSIM, which will bring added convenience, cost-savings, and security to consumers and organizations using mobile devices.

The reality of the eSIM is coming closer with Apple and Samsung reportedly partnering up with the GSMA (http://www.macrumors.com/2015/07/16/apple-standardized-e-sim-cards/), the industry association that represents mobile operators worldwide, along with select international networks, to bring the eSIM to life.

Apple made the first move to bring the eSIM to market late last year when it began releasing iPads with its own multi-carrier capable “Apple SIM” cards built in, which leveraged existing cell infrastructure around the world to provide access to a wireless network server. It also just began providing the option to buy its iPhone 6s and 6s Plus models SIM free and unlocked, indicating that the industry could be coming closer to a standard, multi-carrier SIM card.

While it is likely to face opposition from some network providers, the truth is that manufacturers are quickly becoming the ones with more bargaining power in the market, since consumers no longer need to buy their phones straight from the carriers.

Consumers are tired of being locked into contracts, and hardware manufacturers are tired of facing market barriers that restrict them from deploying their hardware on a global scale. Until now, SIM cards couldn’t be implemented everywhere in the world if strict carrier specifications were not met. This is adding fuel to the fire to make the eSIM a reality and bring to life its benefits including:

**Convenience:** Phones will get thinner and lighter since there is no longer a need for a physical card. Additionally, consumers will easily be able to switch between carriers as they please based on cost and other advantages. Moreover, having more than one phone number will be more convenient to manage, since all the user will need to do is register the numbers to their device and switch back and forth. For organizations, this will also eliminate the need to purchase additional devices.

**Cost-Savings:** Old pricing methods will no longer work and long-term contracts, which are already starting to disappear, will hold even less weight as consumers will more easily be able to shop around and switch providers. There is also talk of developing the software to automatically choose a network for the user according to how fast and cheap it is.

**Travel:** Consumers will no longer have to deal with the hassle of picking a local SIM whenever they go to a new country, and the eSIM could provide a much simpler, one-click, activation process. Roaming charges could also be avoided by an eSIM detecting that the user is in another country and automatically switching networks. This would also make it easier on organizations whose employees spend a lot of time traveling internationally and would save time and expense.

**Security:** Since the SIM cards will no longer be physical, there is no longer the threat of thieves jail-breaking lost or stolen phones. For organizations, the eSIM card will also contain security information, such as private key information, which could be used in authenticating user equipment to a cellular network, and will make it easier to locate lost or stolen devices through Data Loss Prevention

and Mobile Device Management solutions. It will also lead to more secure devices by containing an IMSI (International Mobile Subscriber Identity), being PIN protected, and featuring a security authentication process for the mobile network.

An additional benefit for consumers and enterprises is that network providers will be forced to step up their game in several areas. While the security benefits will definitely make customers and IT admins happier, it will also mean plenty of work carriers. Since consumers will get to easily switch between carriers, the carriers will have to strive to offer constant real-time protection and privacy. Carriers will also need to work out an efficient solution when it comes to provisioning services. The process is already too cumbersome as it is, and carriers will feel even more pressure once the eSIM is out.

With all the added benefits the eSIM will provide, we should be seeing a version of the technology hit the market in the near future. Since Apple was the first to file a patent, it will likely strike first, possibly even as soon as 2016 in some countries with the release of the iPhone 7. From there many other manufacturers will likely follow suit. According to research firm Smart Insights (http://www.smartinsights.net/Smart-Insights-Reports/eSIM-to-reshape-mobile-communication), 346 to 864 million handsets with an eSIM will be shipped yearly by 2020, and the traditional SIM card industry will see at least 16 percent of its shipments disappear by the end of the decade, meaning adoption over the next few years is imminent.

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