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eSIMs - The Connectivity Future?

In theory, eSIMs offer end users the ability to swap between mobile operators without having to physically remove and replace the SIM, enabling more flexibility, more choice, reduced costs and faster deployments.

Yet, while compelling in many ways - particularly within a consumer environment - the reality is that B2B and IoT adoption is both far more complex and much slower, as Mike van Bunnens, Managing Director, Comms365, explores.

What are eSIMs?

An eSIM is a chip-based SIM (MFF2 (QFN8)) that is directly soldered into a device at point of manufacture. The SIM itself is embedded with a Subscription Manager (SM), which is used to securely package profiles that can be provisioned on the device's eUICC (Universal Integrated Circuit Card).

This allows an end user to sign up with a mobile service provider who will provide a downloadable profile, with the SM then loading and enabling the profile. At the end of a contract, the end user can swap to another provider by downloading a new profile; the SM then disables and deletes the current profile and installs the new profile. All of this is done over the air.

This is the principle and is supposed to be able to offer end users more choice, enable the faster deployment of IoT devices that are going to be in the field for many years, reducing the costs of physical SIMs and pushing forward the deployment of many billions of devices.
The reality is a little different.

Slow Adoption

Whilst there is no doubt that eSIM technology is finding its feet in the consumer world (iPhones, iPads and iWatches all have eSIMs built in at source), in the B2B and IoT world the adoption is much slower.

One of the reasons for this is down to the operators themselves. By embracing eSIM they effectively open the doors to their competition by making it easy for their service to be swapped out at the end of the minimum term.

Many service providers are stretching the term eSIM to include Multi-Network / Multi-IMSI Roaming SIMs. These are not the GSMA's definition of eSIMs as they are still in the main, delivered via a traditional plastic SIM, although some will offer the MFF2 SIM option.

When delivered as an MFF2 SIM (i.e provided by the service provider on a reel to be incorporated in the manufacturing process), the service provider should give the end user the ability to download another

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service provider's profile to the SIM (at the end of the contract) in order for it to be called a real eSIM. eSIMs should be seen as a neutral embedded chip, open to any service provider the end user wishes to use (within the terms of their commercial agreements). If this is not offered, then it is questionable whether it is an eSIM.

Whilst eSIMs can be seen as a flexible way to manage contracts and services, there are challenges in the IoT space that are yet to be resolved. Many IoT devices require fixed IP addresses in order to talk to their central offices, or for remote management. An IP address is owned by the operator and not the SIM. This means if the end user swaps provider at the end of the contract, their IP address will change and this isn't practical for IoT deployments.

The production of eSIM enabled devices has also been slow in the non-consumer space, but as more device manufacturers are asked to add eSIM options to their roadmap, adoption will increase.

Alternative Solutions

Some connectivity providers can offer global Multi-Network SIMs, with or without fixed IP addresses, across a number of different platforms, which gives users flexibility to choose the solution that fits their requirements. In addition, some have developed eSIM profiles that can be downloaded to devices that have an embedded SIM already included (including devices such as iPads), and offer seamless pairing with Apple products, or QR code pairing for other eSIM enabled devices.

Such specialist eSIM profiles offer both fixed or dynamic IP and include access to hundreds of operators across the world, local internet breakout, and a host of cyber tools such as deep packet inspection, application restrictions and DDoS.

Opportunity and Risk

Real eSIM brings both opportunities and threats to resellers and MSPs. The opportunities include the ability to win business from already deployed services. Currently, this is a long way off as 99.9% of deployed devices are not eSIM enabled. However in five-to-ten years' time, when eSIM is more mainstream, the opportunity will be bigger.

The threat is that by then, there will be huge competition, with end users having the ability to swap at will. By that time providers will have to offer a lot of additional services over and above data.

As more devices are manufactured with eSIM capability, we should see prices of devices drop, thereby increasing deployments. As end users become more confident in the eSIM functionality and the ability to swap, certainly in consumer-land, swapping providers will become like swapping energy suppliers. Although porting and migrating SIMs is commonplace, there is still a reliance on the providers to make this happen, whereas eSIM purports to offer the end user the ability to make the change immediately (albeit within the confines of their contracts).

Within IoT, we will start to see the production of eSIM-ready devices across all areas, especially devices that need to be in the field for years. This will offer the customer the freedom to shop around for the best deal, though this should be approached with caution, as most IoT deployments are more complex and there are many more variables to consider than just the price of the data. IoT use cases tend to use static IPs, VPNs, secure connections, managed services and more and the price of data isn't always the primary objective.

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Conclusion

eSIMs will, in future, undoubtedly offer flexibility, cost and speed of deployment benefits within both a B2C, B2B and IoT setting. While adoption is currently slow, this is an inevitable route the connectivity sector will be going down. In the meantime, the capability to offer end users viable and cost effective alternatives, including international multi-network SIM solutions, with 4G and 5G enablement, to ensure fast and consistent service, will be the immediate future of connectivity.

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