



Optimizing eSIM management operations: the just-in-time approach

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As mobile operators accelerate their digital transformation and the eSIM ecosystem expands in complexity, it is crucial to adjust eSIM operations with a just-in-time approach for greater flexibility.

The connectivity industry is undergoing a significant transformation due to the accelerating adoption of eSIM technology. The increasing variety of eSIM-equipped devices and use cases makes it harder for mobile operators to ensure seamless user experiences and efficient eSIM management processes. It is time for them to move away from the traditional and static way of managing connectivity if they truly want to capture the opportunities brought by eSIM. A flexible and dynamic approach is the key to delivering the right eSIM profile for every situation—factoring in the end-user device capabilities, geographical location, client type, and specific use case.

The paradigm shift to eSIM technology

According to GSMA Intelligence, eSIM smartphone connections are expected to reach 50% of total smartphone connections by 2028, with a staggering 6.9 billion eSIM smartphone connections projected by 2030¹. This growth is driven by the expansion of eSIM-only devices beyond the US, where they were first introduced with the iPhone 14 in 2022.

The transition to eSIM technology represents more than just a technological upgrade; it's a paradigm shift. As eSIM becomes the new standard for connecting people, it is evolving into a critical core service for mobile operators—eSIM services now reflect the mobile operator brand directly. This shift demands a fresh approach to both front-end user experiences (to deliver excellent services) and back-end operations (with a focus on optimizing internal processes).

The many challenges of eSIM profile management

There's no such thing as a one-size-fits-all eSIM profile. Each device has its own specific characteristics, such as the supported network type (4G or 5G) or the type of Subscription Concealed Identifier (SUCI) encryption used to protect the subscriber's identity—whether it's on the eUICC or the device itself. A static approach to eSIM profile management means mobile operators need to maintain different Stock Keeping Units (SKUs) of eSIM profiles for each device type, eUICC type, use case, geography, etc. The multiplication of eSIM profiles SKUs is both time-consuming and costly in terms of inventory management.

Some eSIM profiles stock may become obsolete for various reasons such as changes in roaming partners or in case of network upgrade to 5G. Whenever a change occurs and needs to be applied to already provisioned eSIM profiles, mobile operators end up having to discard outdated profiles and generate new ones, which is inefficient and costly.

With this static approach, MNOs also face limitations in customizing eSIM profiles to meet the needs of their customers, partners, and MVNOs in different situations. For instance, if a reselling partner wants to display their own brand as service provider name for a marketing campaign, the MNO must create a complete inventory of eSIM profiles for this purpose. This challenge is amplified when managing multiple partners and MVNOs, further complicating inventory management and all requests of customizations.

As eSIM adoption continues to grow, it is becoming increasingly important for mobile operators to optimize their processes to remain competitive and efficient.

Future-proofing eSIM processes with a just-in-time approach

Just-in-time profile generation allows mobile operators to adjust any element or metadata of an eSIM profile through a simple API call at any time before the download, or even in real-time during the download. Thus, eSIM profiles become versatile and adaptable to the end-user device capabilities, geographical locations, client types, or chosen services.

This flexible and dynamic approach solves the inventory nightmare and alleviates the customization limitations outlined above. It enhances the user experience by delivering the most appropriate eSIM profile for each situation, even for newly launched devices. It also eliminates obsolescence by allowing updates to existing profiles, preventing eSIM profiles waste as well as the need to discard outdated physical eSIM vouchers.

Embracing just-in-time eSIM profile generation for competitive advantage

The transition to eSIM technology presents a significant opportunity for mobile operators to innovate and enhance their service offerings. By adopting a dynamic approach, operators can streamline their processes, reduce costs, and provide a superior eSIM activation user experience. Those who adopt this strategy position themselves at the forefront of the industry and thrive in the evolving connectivity landscape.

¹ <https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-economy/wp-content/uploads/2024/02/260224-The-Mobile-Economy-2024.pdf>
