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Why is eSIM making device entitlements so important for mobile operators?

 #   CONNECTIVITY

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Mobile networks and connected devices today are evolving at a rapid rate, offering new and innovative features to end-users. eSIM is being used to connect new types of devices, such as smartwatches, to cellular networks. According to forecasts, over 4 billion eSIM consumer devices – smartphones, wearables, PCs or tablets – will ship between 2020 and 2025[1]. 5G networks will increase network capacity and bandwidth, pushing computing capabilities into the cloud while simultaneously enabling more advanced network features and new use cases for these kinds of devices. By handling the onboarding and provisioning of eSIM devices, entitlement servers will allow mobile operators to support these advanced network features and use cases.

What is an entitlement server?

To ensure a consistent end-user experience, device makers have started to issue specifications for mobile operators, describing use cases related to eSIM-enabled devices. These entitlement specifications are meant to be implemented by an entitlement server that sits within the mobile operators' networks and acts as an interface **between the network and the end-user's device**.

An entitlement server first role is to ensure that the network supports the advanced network features required by a given device and that the subscriber is authorized to access those features. Then, it orchestrates the workflows to provision those features on both the network and device.

Since entitlement servers are utilized during device onboarding, they often integrate websheets in the activation process that interact with the end-user. These websheets are like mini web pages hosted by the mobile operator and shown on the device, typically for the purpose of displaying and collecting information from the subscriber. This could include displaying plans, consent to terms and conditions, or collecting payment information. Websheets are key to device onboarding and the device entitlement process, with the ultimate goal being to ensure a seamless end-user experience.

A history of device entitlements

The first entitlement specifications added support for non-essential network features like hotspot tethering, i.e. the ability for a smartphone to share its cellular connection with another device – such as a PC. While hotspot tethering is a valuable feature, it is not essential to the operation of the smartphone (or PC, for that matter) and it was entirely possible for subscribers to use the phone on a network without hotspot tethering.

At the same time, some mobile operators required an additional fee to support these advanced features. Checking the status of a subscriber's authorization for entitlement-supported features is another role that the entitlement server plays.

Over time, as devices become increasingly connected and reliant on cellular networks, the role of the entitlement server became more essential for mobile operators. Voice-over-LTE (VoLTE), Voice-over-WiFi (VoWiFi), and Enhanced 911[2] (E911, or E112 in some countries) are all examples of IMS (IP Multimedia Subsystem) features that rely on entitlement servers.

eSIM and entitlements

The use of eSIM for cellular connectivity in consumer devices further increases the role of entitlement servers to ensure a seamless user experience.

From a device maker's perspective, a seamless user experience can be defined as one where all types of devices are always connected, synchronized, and act together in a unified way. In other words, a smartphone, smartwatch, PC, tablet, and car belonging to a single user would all be connected to the same cellular network and send or receive calls (or text messages) with the same phone number.

This type of continuity **across multiple devices** can be a key differentiator for both device makers and for mobile operators. For device makers, it creates a strong sense of loyalty with the end-user and reluctance to switch to a competing device maker's ecosystem. Likewise, for mobile operators, the ability to fully support all the features of all devices from one maker helps increase loyalty and reduces subscriber churn.

eSIM is also critical to support new, convenience features like subscription transfer between devices. Consider a scenario where a subscriber's smartphone must be repaired and will be out of service for a couple of days. Rather than be without a phone, the repair center issues the subscriber a temporary phone and in doing so, they also temporarily transfer the customer's eSIM profile from the main phone to the loaner phone. The operator's entitlements server ensures all of this happens seamlessly and reliably.

Today the Multi-SIM Entitlement specification, which permits the use of the same phone number on different devices, is offered between smartphones and smartwatches. In a foreseeable future, we may also see Multi-SIM applied to a wider array of devices. One could easily imagine it being applied to cars, smart speakers, smart glasses and other wearables. In other words, all connected devices could act as a phone, using the same phone number, without the presence of the primary phone itself.

The future of entitlements

With new categories of devices being connected like smartwatches, smart glasses, and others, a consistent and controlled user experience across all devices is more important than ever. A continuous user experience across multiple devices is what builds customer loyalty to both the the device maker and the mobile operator.

As more eSIM connected devices are introduced, entitlement servers will play an increasingly important role for mobile operators. Being capable of handling entitlement specifications from different device makers will help them ensure a broader device portfolio with faster time-to-market for each new device.

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[1] ABI Research, eSIM in the Consumer and M2M Markets, Q3 2020

[2] A service that allows emergency operators to provide better assistance to people calling 911 from their mobile phones by providing dispatchers with the location to the call

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