WHITEPAPER

OPTIMISE ENTERPRISE IOT & MOBILITY WITH EUICC

eUICC and eSIM technology gives Enterprises control of IoT connectivity, simplifies international deployments of IoT devices and the transition to mobility services

November 2016
The emergence of eUICC or eSIM technology has been largely driven by the Automotive industry as a means to increase flexibility, optimise costs and simplify the logistics of car production, distribution networks and after-sales support.

Car-makers in particular are also promoting mobility services such as car-sharing, parking or charging assistance and can even extend vehicle longevity or upgrade vehicle functions via over-the-air (OTA) software updates.

Connectivity is the key enabler.

Those same benefits and capabilities are relevant across many IoT business sectors particularly for global Enterprises with large-scale internationally deployed assets or large field service teams. Similarly for those deploying connected products and services to a global market.

Enterprises should invest in eUICC if they have active projects or plans for any of the following:

- IoT deployments which stay in the field for more than 2 years
- Global supply-chains or distribution networks
- Mobility solutions (people and/or products/services) which require roaming
- Higher Data applications where connectivity is more cost sensitive
FUTURE PROOF

An eUICC solution will have significant advantages for IoT devices with very long lifetime in service, deployed in harsh environments or hard to reach locations. OTA subscription management provides freedom:

- from long term contract commitments
- to take advantage of market dynamics in the form of improved pricing or coverage options
- to switch out providers without recalling devices
- no need for field visits, saving time & reducing costs
- extend lifetime of 2G & 3G connected devices
- fit solderable SIMs on the production line, improving security & removing a source of unreliability
Enterprises who sell connected products and services to a global market will benefit from eUICC, likewise multi-national companies with worldwide operations, people and assets. A single SIM can be used in all instances even if the operating destination is unknown or if mobility is required. Subscription management enables:

- the appropriate subscription for region, application & corporate policies to be downloaded
- the best commercial service in each area at local rates
- local regulatory requirements to be met
- roaming charges to be avoided
Remote provisioning SIM (eUICC) solutions provide the ability to store and dynamically manage more than one operator profile. Remote Provisioning is the ability to remotely change the SIM profile on a deployed SIM without having to physically change the SIM itself.

Using this approach, large scale international deployments are possible using a single factory installed SIM. The user subscription can be updated when the device is in the field. Depending on the application scenario, this might be a one-off operation or more frequent for mobile products or services. Ownership and management of this process is now in the hands of the Enterprise removing dependency and potential lock-in situations with individual MNOs (mobile network operators) or individual technologies.

**HOW DOES eUICC DIFFER FROM A GLOBAL / ROAMING SIM?**

Both options can supply global coverage with a single SIM.

The roaming SIM leverages the global roaming exchange (GRX) network which has a cost overhead. For lower data volumes this overhead is commercially justified by the convenience of roaming.

For higher data, eUICC provides the means to remotely program the SIM to use a local MNO subscription therefore reducing or removing the cost-overhead of roaming.

The ability to switch MNO subscription remotely can be useful in achieving compliance with local regulations and laws, for instance in countries where permanent roaming is not allowed.
HIGHER DATA

For low-data usage the convenience of the global/roaming SIM has commercial merit.

For higher-data applications the roaming and data charges can start to add up. eUICC lets you select and apply the best subscription for the device location and application. High-data applications include:

- security cameras and vision based systems
- intercity buses or trains that offer public Wi-Fi
- employees who use tablets when they travel
- a car that provides infotainment or video streaming services or can act as a Wi-Fi hotspot for passengers
MOBILITY

The ability to remotely manage device subscriptions enables Enterprises to control connectivity costs globally using a mix of roaming and local subscriptions. By centrally standardising connectivity services, the Enterprise also has control over how connectivity is managed and secured. It empowers:

- Car makers optimise after-sales support & user-experience
- Utilities connect vehicle fleets & field service personnel
- Industrial machine builders provide remote maintenance services
- Insurance companies deploy connected solutions which encourage better lifestyles, safer driving & discourage fraud
- Advertisers run real-time, location & context-aware campaigns
- Retailers to be agile & deploy consistent advertising/pricing
EUICC can be used in automotive, industrial and consumer applications.
SIM cards come in a variety of sizes and have features optimal for different business cases. These include 2FF (mini-SIM), 3FF (micro-SIM) and the latest and smallest 4FF (nano-SIM).

The 2FF-4FF form-factors are also available in industrial-grade with a thicker pin plate which helps protect from corrosion, vibrations and other environmental factors such as extreme temperatures (-40°C to +105°C).

There is also an embedded SIM (eSIM) option.

**MFF2 (eSIM)**

Embedded SIMs are fast becoming the most common choice for M2M applications. eSIMs are vacuum sealed and soldered down on an electronic circuit board which provides a number of compelling benefits:

- **Miniaturisation** – product design need not be constrained by the size and style of the traditional SIM card carrier
- **Ruggedised** – being embedded within a device provides environmental shielding and reduces the chance of malfunction due to shock or vibration
- **Security** – better protection from physical tampering and theft
- **Operational life** - a typical lifespan of 10-17 years ensures operation throughout the device lifecycle

Remote provisioning capabilities, enabled by eUICC technology, can be added to any SIM form factor (2FF, 3FF, 4FF, MFF2) and can be used in automotive, industrial and consumer applications.
Using a global/roaming SIM profile for initial device connection large scale will enable international deployments via a single factory-installed SIM. For lower data applications this may well be all that is needed. For higher data applications, that profile will serve as the eUICC bootstrap profile enabling a connection with a subscription management service and the subsequent download of the ‘local’ profile appropriate to location, user credentials and corporate rules.

This approach simplifies manufacturing and distribution logistics and enables a standardised approach to data connectivity without the complexity of multiple MNO agreements or SIMs.

1. Device roams onto any available Network. The eUICC bootstrap profile enables connection to a Subscription Management Platform

2. The device sends location, user and network information. If required, the device receives operator profile appropriate to location, user credentials and corporate rules

3. The device can re-initiate profile update sequence if network conditions change or user/location context changes

Arkessa global/roaming SIM can connect to over 500 networks in ~200 countries with a 99% first time connect rate.
The GSMA specification for eUICC - “Remote Provisioning Architecture for Embedded UICC v3.1” - defines the processes, systems, and interfaces for managing remote provisioning SIMs in a secure and standardised way. It dictates interoperability which ensures that SIMs and provisioning systems from different providers will use the same techniques for downloading, activation and the disabling/deletion of subscriptions.

Early adopters of eUICC will benefit from the advice and support from their trusted suppliers to realise the return on investment. As with all new technologies, it is important to be well-informed and to anticipate the challenges associated with new technologies.

Arkessa is a Service Provider MVNO (mobile virtual network operator) and we have a proven track record of eco-system partnering to enable Global Enterprise IoT which delivers business value. We can help you navigate the eUICC landscape, understand the details and the strengths of the different processes and suppliers. We can partner with you to deliver true dynamic, over-the-air provisioning and subscription management.

eUICC ECO-SYSTEM

SIM supplier

- eUICC capable SIM
- Embedded SIM
- Commercial and Industrial Grade
- Interoperability

MVNO

- Bootstrap Profile
- Profile Delivery
- Connectivity Management
- Monitoring, Reporting, Billing

Subscription Management

- Profile Generation
- OTA provisioning
- Secure
- Interoperability

MNO e-profiles

- e-profile support
<table>
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<th>Benefits of Remote Subscription Management</th>
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<tr>
<td><strong>Simplicity</strong></td>
<td><strong>Best in Class Coverage</strong></td>
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<td>Overcomes the hurdles of fragmented markets with different carriers and technologies by offering one consistent solution over multiple networks and countries.</td>
<td>Provides access to Global tier 1 operators with an unparalleled network footprint and leading in LTE deployment.</td>
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<td><strong>Lower TCO</strong></td>
<td><strong>Service Excellence</strong></td>
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<td>Reduces total cost of ownership thanks to efficient provisioning and management of services across a global footprint.</td>
<td>Ensures superior and enhanced quality of service, e.g., customer support and issue management over multiple operators.</td>
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<td><strong>New Services</strong></td>
<td><strong>Future Proof</strong></td>
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<td>Enables flexible and on-demand business models for differentiated Enterprise services and applications.</td>
<td>Take advantage of market dynamics and improved pricing or coverage options when they become available. Extend lifetime of 2G &amp; 3G connected devices.</td>
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Arkessa is an award-winning Machine to Machine (M2M) and Internet of Things (IoT) managed connectivity service provider.

As an MVNO, Arkessa has a proven track record of partnering with the ecosystem to enable Global Enterprise IoT and deliver demonstrable business value.

- Connectivity-as-a-Service
- Mobile Broadband
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