

# Addressing the Challenges with an Embedded SIM

Keeping pace with the subscription management discussion

Giesecke & Devrient (G&D) is driving standards for the embedded SIM together with partner Mobile Network Operators (MNOs), and a new joint project is finding solutions for how the secure remote management of embedded UICC (eUICC) credentials can be handled. G&D is already taking the first steps to manage the consequent migration from today's in-house SIM personalization to future Over-the-Air (OTA) remote SIM personalization. G&D's core competence in secure data management is essential in the personalization both today and in the future.

## Next-generation SIM for machine-to-machine communications

Since the early 1990s, the little plastic Plug-in SIM card has without doubt contributed greatly to the overwhelming success of mobile communications. The SIM contains all the important subscription credentials to authenticate the subscriber to the cellular network, and allows the subscriber to be uniquely identified and billed. Standardized physical, electrical, and software interfaces among others are the prerequisite for this extremely successful smart card application.

The separation of the handset, which holds no subscription data, on the one hand, and the security token – the SIM – on the other, has enabled separate value chains for cost-effective production and delivery of rapidly evolving mobile communication devices.

An evolution, or even a revolution of the SIM, began with the new M2M (machine-to-machine) markets that opened up at the beginning of this century. The SIM has to meet the demands of the emerging

world of connected devices, serving a whole range of applications such as automated reading of utility meters, provisioning of services to a connected vehicle, or tracking of supplies through the delivery chain.

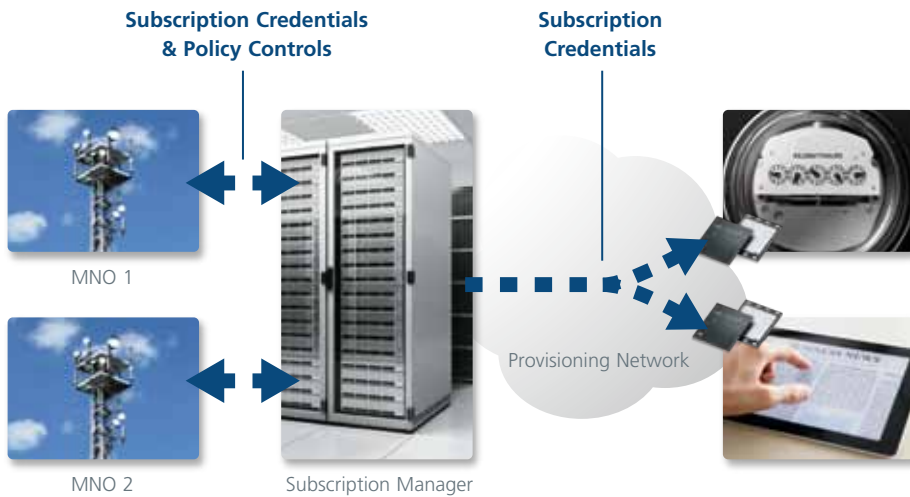
It was realized by players in the telecommunications industry that, similar to the early days of GSM, a standardized approach would be most beneficial to the industry as a whole. This was also seen in the light of the billions of connected devices "The Internet of Things" would bring to the mobile industry. For this reason the Technical Committee "Smart Card Platform" (TC SCP) of the European Telecommunications Standards Institute (ETSI) standardized two form factors for machine-to-machine applications, the so-called machine-to-machine form factors (MFF). One of these, MFF2, is solderable and allows the mass production and distribution of wirelessly connected devices that benefit from a smaller SIM and the possibility to solder it onto the circuit board of an M2M device. As the MFF SIM is embedded into the device, it is referred to by "embedded SIM" and "eUICC."

## A shift of paradigm with an early embedded SIM

The mobile communications industry is currently facing completely new scenarios. Millions of mass-produced devices will have a SIM or the UICC embedded in the device during production – but this will not yet contain the credentials for a subscription from a specific MNO.

This results in a far more stringent separation of the SIM value chain into the trusted hardware and software platform (the UICC), and the updateable content (the network access credentials and other confidential MNO data).

To push development in this new field further, and to safeguard commercial success and roles by laying the foundation for standardization for the embedded SIM and its management, G&D, Telefónica O<sub>2</sub> UK, Deutsche Telekom, and Vodafone Group worked together in the SIMEG2010 initiative. The results were handed over to the GSM Association and are the basis of the current standardization approach.



The subscription manager has a close relationship with the MNOs and manages the subscription credentials in embedded SIMs

In this prevailing view, a so-called Subscription Manager (SM) is expected to prepare, manage, and download network access credentials and other confidential MNO data to the embedded SIM in a highly secure way upon request of an MNO directly. Based on MNO policy, the subscription manager can provide, change, suspend, terminate, or even transfer subscriptions between devices over the air (OTA) or over the Internet (OTI).

### Benefits of subscription management for the different players

Subscription management is a necessary enabler in large-scale, multinational production when the destination network may be unknown at the time of production. It will be possible to load the network access credentials to the eUICC after deploying the device.

Once in the market, the lifespan of M2M applications may exceed the duration agreed for the communication services of the first MNO contract. Remote management of subscriptions to update the network access credentials embedded in the device removes the cost of manually exchanging the SIM, and may save a visit to a remote location.

At the end of the lifecycle of a communication device when the commercial service is stopped, the devices will continue to use network resources as the UICC is embedded. Remote subscription management technology can terminate the subscription in the eUICC and therefore removes the cost of manually removing the SIM when terminating the service.

The eUICC and subscription manager technology help MNOs to reduce SIM inventory

and assign network resources only to active M2M devices. This allows the MNO to run large scale M2M networks cost-effectively without having Mobile Station Integrated Services Digital Network numbers (MSISDNs) tied up to support not yet activated M2M devices.

### The portfolio offered by G&D

G&D is actively working with the industry to develop the essential additional standards; however, G&D can already offer commercial subscription management solutions today which leverage the thinking in the latest developments of the international standards. The offering builds upon G&D's widely deployed solutions for multi-IMSI SIM cards and on-demand activation (ODA) – building blocks for the eUICC and subscription management.

G&D offers SIMs in all form factors and trusted subscription management services to meet all requirements. Different business scenarios and manufacturing environments need different solutions. Therefore, G&D provides eUICCs with MNO subscription data already provisioned at the G&D factory (today's SIM model) or so called "vanilla" eUICCs, with the remote download of the MNO subscription data when the device is manufactured, bought, or first activated. ◀

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## Glossary

### Subscription management

The subscription manager is responsible for the preparation of eUICC data and for the secure download of secure data to the eUICC.

### M2M (machine-to-machine)

M2M communication is the automated exchange of data between machines, installations, individual modules, and entire systems – all without additional human intervention. It is used for transmission of measurements and readings by SMS, GPRS, and UMTS, for radio transmission of consumption data, and for accessing and controlling machines remotely.

## G&D shows live management of SIM credentials at the Mobile World Congress 2012!



G&D's intensive work with important European mobile network operators (Vodafone, Telefónica, SFR) in the Embedded SIM solution field is presented at the MWC 2012 in a live demonstration on subscription management at the G&D booth B65 in hall 8. The core element of the solution is G&D's AirOn™ platform – a highly secure remote platform – that enables remote management of subscription credentials. Furthermore, G&D's products are selected by the GSMA for its proof-of-concept (POC) of the "Embedded SIM Project" and are presented in the GSMA Connected House (Courtyard CY13).

These live demos show the remote loading, transferring, and deleting of subscriptions and demonstrate the openness of G&D's subscription management server by managing eUICCs from various SIM suppliers. G&D thus underscores its leading role in the subscription management field and its support of ongoing standardization activities based on the principles of the GSMA for the roles and responsibilities of a subscription manager.