



# Business Process for Remote SIM Provisioning in M2M

## Version 1.0

### 18 February 2015

*This is a White Paper of the GSMA*

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# 1 Introduction

## 1.1 Overview

The GSMA Embedded SIM Specification provides many benefits to the M2M OEM in order to manage connectivity for their deployed devices with Subscription Management tools Over the Air (OTA) . This is key since devices and eUICCs will be hard –linked (soldered) until the EOL (**End of Life**) of the OEM product. Different OEM device lifetime scenarios are to be considered and analysed in this document, such as the launch of a device and its related product in different geographies with a given operator framework, and the capability to change the overall product connectivity to a different competing Operator frameworks during the lifetime of an M2M device, via a remote download of a new Operator Profile.

The above capabilities are particularly important to the OEM given the challenges of installing and changing out a physical SIM in many M2M devices (financial, logistical and technical in some cases).

However, changes of Operator Profiles, especially over a large set of eUICC devices can be a complex activity. Such transfers need to be carried out in a structured, methodical way.

Additionally, there needs to be trust among all parties. For example the OEM needs to trust that the Operator will execute any required change at the end of contract in a timely manner. And the Operator needs to trust that the OEM would not initiate any change prior to that time. In general, changes of Operator Profile would only happen in accordance with contractual terms agreed between parties.

## 1.2 Purpose

The purpose of this document is to provide specimen points for M2M OEMs and Operators providing eUICC-based services based in M2M scenarios, particularly around the typical business processes required in the delivery of such services, such that all parties can attain a high degree of confidence that those business processes will be executed:

1. when required, subject to any agreed contractual terms
2. in a formal, pre-defined manner, transparent to all parties.

It may be useful therefore, for this document to be referred to, in all or part, in any contractual documents between the parties involved.

## 1.3 Scope

The GSMA Embedded SIM Specification provides for any number of Profile management scenarios, but in order to create an early and straight-forward approach, the document is limited to these business processes:

1. Change of Operational Profile to another at end of contract
2. Change of profiles between concerted operators
3. Fallback mechanism

Future versions of this document may increase this scope as the market develops.

## 1.4 Definitions

Following shows the terms and definitions used in the present document.

For the purposes of the present document, the terms and definitions given in SGP.01[2] and SGP.02[1] apply. A term given in following does not take precedence over the definition of the same term, if any, in SGP.01[2] and SGP.02[1].

Term	Description
Actor	An actor is a physical entity (person, company or organisation) that can assume a role in the functional architecture. It is possible for an actor to assume multiple Roles in the same functional architecture.
Bootstrap Profile	A Profile containing one or more Network Access Applications, and associated Network Access Credentials which, when installed on an eUICC, enables access to communication network(s), only to provide transport capability for eUICC management and Profile management between the eUICC and an SM-SR
Embedded UICC	A UICC which is not easily accessible or replaceable, is not intended to be removed or replaced in the terminal, and enables the secure changing of Subscriptions.
Fall-back Attribute	This is an attribute of a Profile which, when set, identifies the Profile to be enabled by the Fall-back Mechanism. Only one Profile on the eUICC can have the Fall-back attribute set at a time. The Profile with Fall-back Attribute set cannot be deleted.
Network Access Application	An application residing on a UICC which provides authorization to access a network e.g. a USIM application as defined in SGP.01 [03].
Operational Profile	A Profile containing one or more Network Access Applications and associated Network Access Credentials and Operator's (e.g. STK) applications and 3rd party Applications as defined in SGP.01 [03].
Operator	A mobile network operator or mobile virtual network operator is a company providing wireless network services.
Policy Rule	Defines the atomic action of a Policy and the conditions under which it is executed.
Profile	Combination of a file structure, data and applications to be provisioned onto, or present on an eUICC.
M2M Service Provider	Actor who provides services to its service Subscribers on a contractual basis and who is responsible for the services offered.
Subscription	Describes the commercial relationship between the subscriber and the operator.
Subscription Manager Data Preparation	Role that prepares Operational and Provisioning Profiles to be securely provisioned on the eUICC and manages the installation of the Profile on the eUICC as defined in SGP.01 [03].
Subscription Manager Secure Routing	Role that securely performs functions which allow secure transport of both Platform and Profile management commands in order to load, enable, disable and delete Profiles on the eUICC as defined in SGP.01 [03].
Transfer Plan	This a plan agreed between Operator 1 and Operator 2 when changing profiles

## 1.5 Abbreviations

Term	Description
CI	Certificate Issuer
EOL	End of Life
eUICC	Embedded Universal Integrated Circuit Card
EUM	eUICC Manufacturer
NAA	Network Access Application
OEM	Original Equipment Manufacturer
POL1	Policy Rules within the Profile
POL2	Policy Rules associated to a Profile and stored in the relevantat the SM-SR
SM-DP	Subscription Manager Data Preparation
SM-SR	Subscription Manager Secure Routing
UICC	Universal Integrated Circuit Card
USIM	Universal Subscriber Identity Module

## 1.6 References

Ref	Doc Number	Title
[1]	SGP.02	GSMA Remote Provisioning Architecture for Embedded UICC Technical Specification Version 2.0
[2]	SGP.01	GSMA Embedded SIM Remote Provisioning Architecture Version 1.1 December 2013

## 2 Guiding Principles

### 2.1 Principle 1

The business processes described in this document are limited to eUICC profile management using the GSMA Embedded SIM Specifications [1][2]

Profile management comprises only part of the overall M2M service proposition, and should be subject to their own business processes. Additional service propositions outside the scope of this document include but are not limited to:

- Service level agreements
- Integration and alignment of key services such as billing and provisioning
- Customer services
- Device configuration e.g. Access Point Names

All other areas aside from profile management should be taken into consideration when performing the transfer of M2M services and should be detailed within the overall commercial and contractual framework. This document describes profile management.

### 2.2 Principle 2

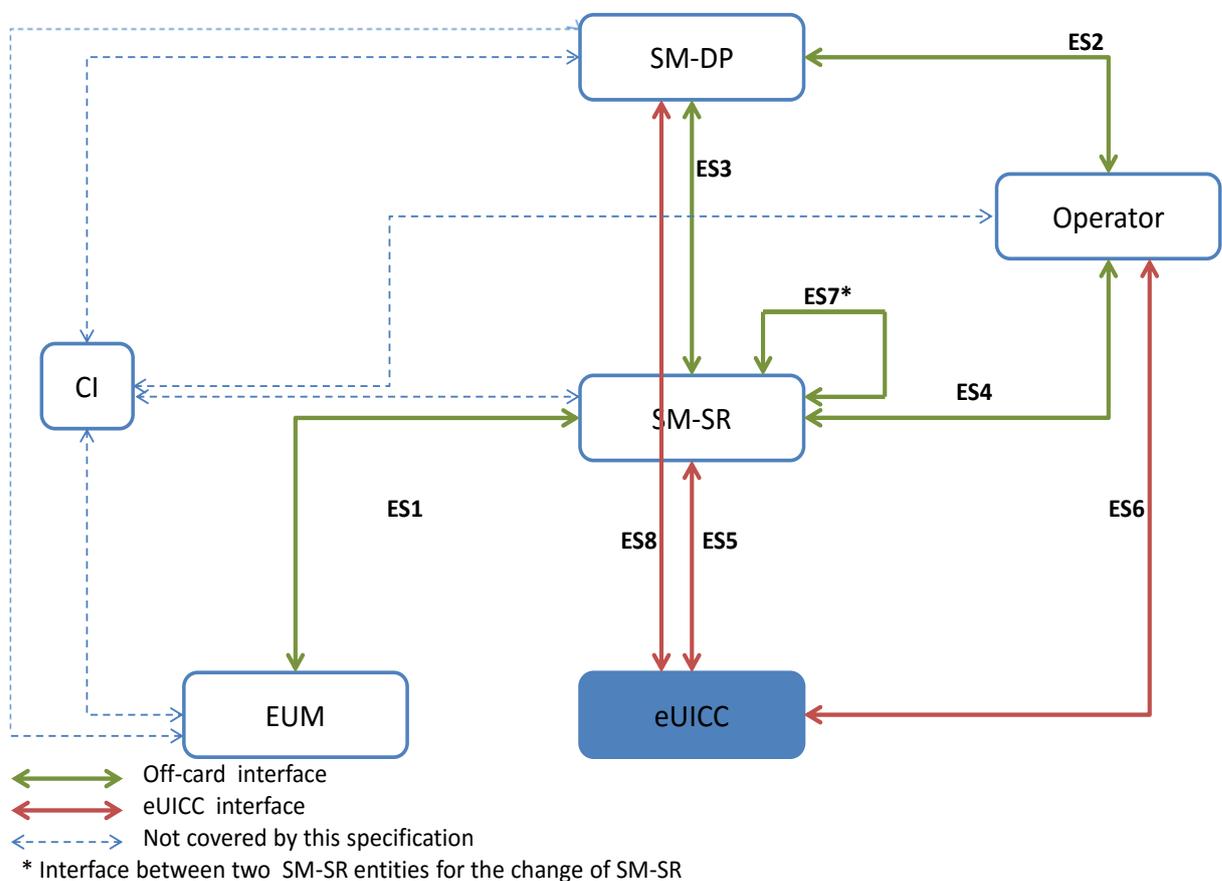
The operator based processes defined in the document and the use of the GSMA Embedded SIM Specification will boost the market development.

An adopted standard architecture for Subscription Management and the use of an eUICC in a similar manner by the users following general operator process rules to connect to the wireless networks, will allow:

- To maintain and reinforce an open market in M2M/IOT in the same way as it has been done in GSM/3G/4G technologies.
- Interoperability in different networks
- Strong access security to internet and enterprise networks.

### 3 General Architecture and Roles

In section 2.1 of [1] the following diagram represents the general architecture of the GSMA Embedded SIM Specification:



**Figure 1: GSMA Embedded SIM General Architecture**

All of the ES interfaces shown in this diagram are detailed throughout SGP.02[1].

It is worth considering some of the roles within this architecture, and determining the commercial contract suitability of the Operator for those roles, as part of the overall provision of network connectivity of the M2M OEM.

The following table is a summary analysis that may assist the M2M OEM, and the basis for the business processes that can be agreed between the Operators to the OEM are detailed later in this document.

Role	Description	Why operators are best placed
EUM	Supplier/manufacturer of the physical eUICC modules, including O/S and applications	<ul style="list-style-type: none"> <li>- able to multi-source eUICC product from several SIM vendors supporting the GSMA Remote Provisioning Architecture</li> <li>- already purchasing large quantities of product from SIM vendor allows for good contract negotiation</li> <li>- Operational clout to be able to quickly resolve eUICC product issues</li> </ul>
M2M Device Manufacturer	Builds machine to machine Devices typically comprising a wireless module and an eUICC	<ul style="list-style-type: none"> <li>- able to test interoperability between eUICC, device, and network</li> </ul>
Operator providing the Bootstrap Profile	Owns the Profile and contracted for providing Bootstrap Profile that enables the device to access a mobile network for provisioning as defined in SGP.02[2]	<ul style="list-style-type: none"> <li>- able to offer the whole package (i.e. single contract), including global coverage using existing business relationships, alliance groups and roaming deals, providing global coverage.</li> <li>- being a large organisation provides long term stability and viability in the marketplace and financial wherewithal to resolve internal/external operational issues quickly and effectively.</li> <li>- Proven ability over many decades for managing secure, mass market, real-time core network infrastructure operating 24/7 at high availability.</li> </ul>
Operator providing the Operational Profile	Owns the Profile and contracted for providing Operational Profile that enables the device to access a mobile network for operation as defined in SGP.02[2]	<ul style="list-style-type: none"> <li>- SM-DP and SM-SR roles are especially close to core Operator competency: can be either owned and hosted locally, or integrated as part of a managed service provided by an SM-DP/SR provider</li> <li>- knows about the intricacies of subscription management more than any other ecosystem player</li> </ul>
SM-DP	Prepares Operational and Bootstrap Profiles to be securely provisioned on the eUICC and manages the installation of those Profiles on a eUICC.	<ul style="list-style-type: none"> <li>- understands all aspects of eUICC Profile configuration, including algorithms, network (re)selection parameters, SIM applications</li> <li>- secure protocols required for information</li> </ul>

Role	Description	Why operators are best placed
SM-SR	Performs functions allowing secure transport of both Platform and Profile management commands in order to load, enable, disable and delete Profiles on a eUICC	transfer between MNO and trusted provisioning partner (e.g. SIM vendor) are already in place - years of experience working with the many challenges of remotely managing SIMs via OTA, including impact on network resource availability. - an Operator contracted to provide the Bootstrap and Operational Profiles allows for reduced number of contracts and also connectivity history for an eUICC
Certificate Issuer	Issues certificates for Embedded UICC remote provisioning system entities and acts as a trusted third party for the purpose of mutual authentication of the entities of the system as described in SGP.02[2]	- The GSMA, acting on behalf of the Operator community is providing this capability

### 3.1 Operator and eUICC elements interoperability

The most important feature that the eUICC has to deliver to its users and service providers is compatibility with the Subscription Management ecosystem, as depicted following diagram.

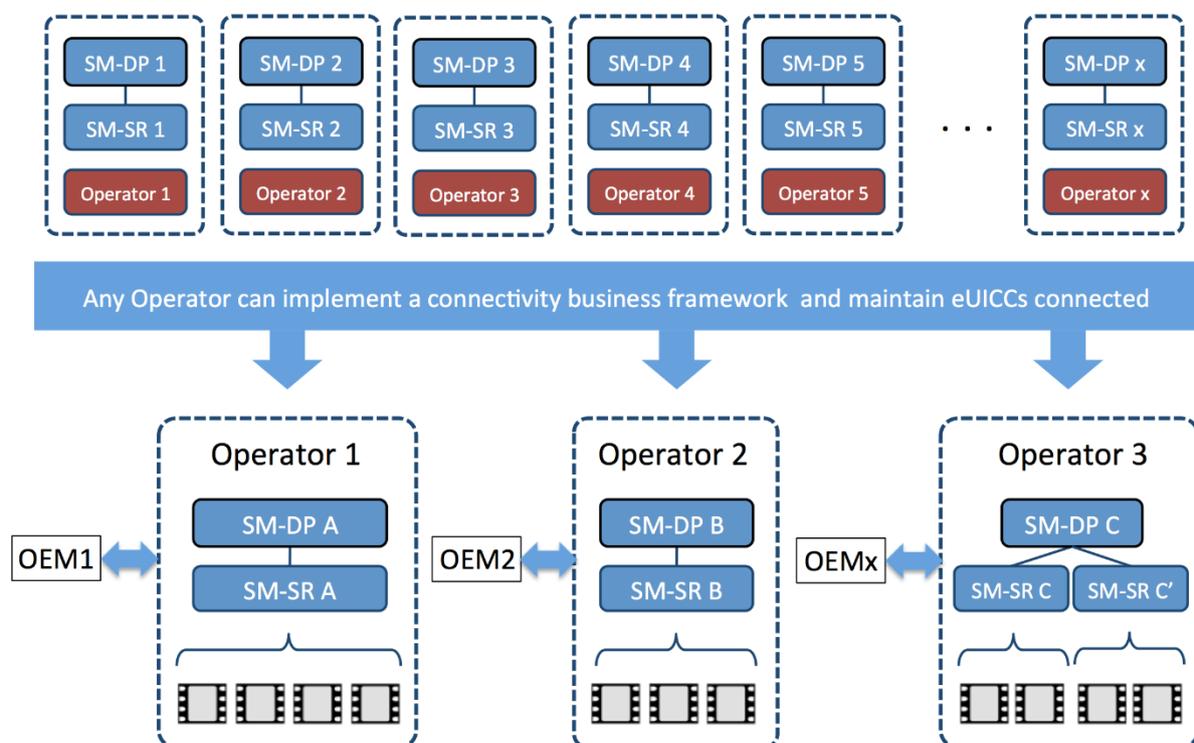
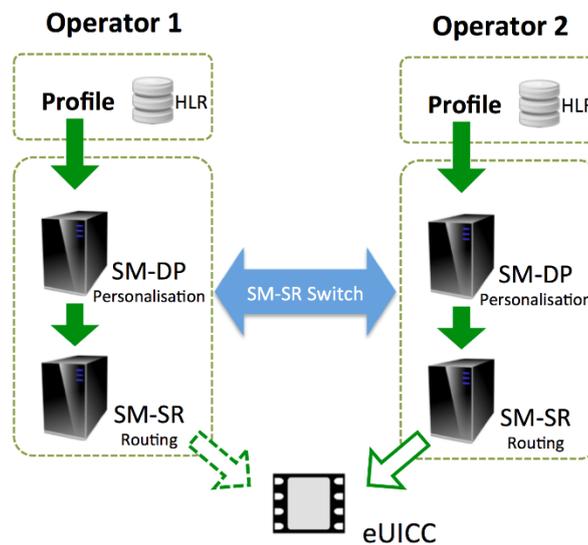


Figure 2: GSMA Subscription management Interoperability

**N.B.** In order for compatibility to be achieved all vending parties respective SM-SRs and SM-DPs have to be interoperable with each other.

Two GSMA subscription management specification features allow this:

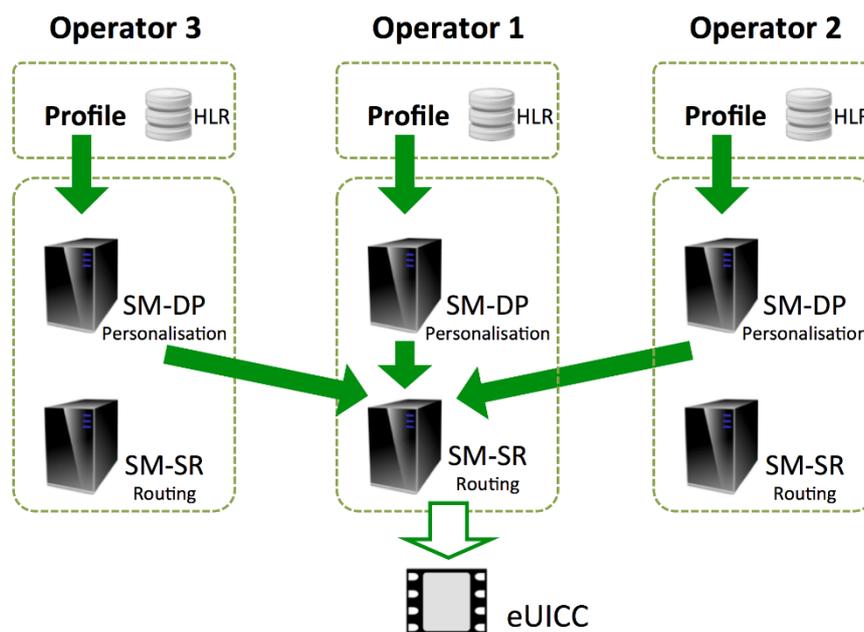
- 1) SM\_SR switch process (Figure 3), in which a given SM\_SR linked with an eUICC can be replaced with another one (from another SM provider and/or operator framework).



**Figure 3: SM\_SR Switch**

**N.B.** The SM-SR swap described requires a key exchange between the SM-SRs. An eUICC must have a one-to-one relationship with the SM-SR.

- 2) Profile Interoperability where any profile coming from any SM\_DP could be downloaded to an eUICC via its linked SM\_SR via various mechanisms.



**Figure 4: Profile interoperability**

**N.B.** Based on GSMA Embedded SIM Technical Specification V2.0, until full interoperability is achieved SM-DP and eUICC need to be linked with from the same vendor in order for a profile swap to work in the manner described currently.

## 4 Potential Deployment Models

The following deployment models are considered as the basis for providing context and also illustrations of the business processes.

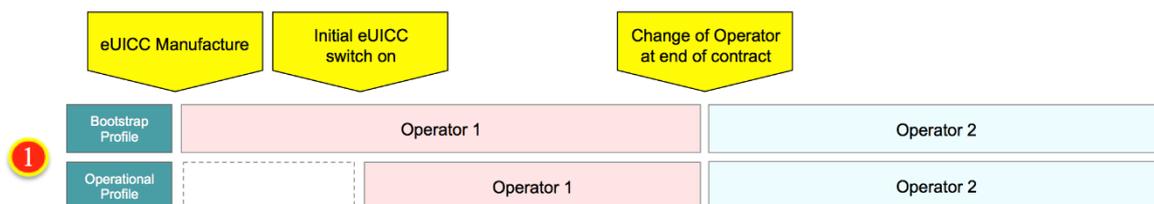
These are not the only possible deployment models, nor are they mandated, but they have been selected by the GSMA as typical, workable deployment models for the market, and M2M OEMs and Operators can use them as the basis for contractual agreements.

All of the models are expressed as a timeline from left to right, with various actors controlling the Bootstrap and Operational Profiles on the eUICC and various events during the lifetime of the eUICC causing changes to those Profiles.

The Policy Rules as defined in [1] and [2] need to be considered for all the described deployment models and business process in this document. See Annex A for additional information on Policy Rules.

### 4.1 Model 1 – Single operator provider

The following diagram is a pictorial representation of Deployment Model 1:



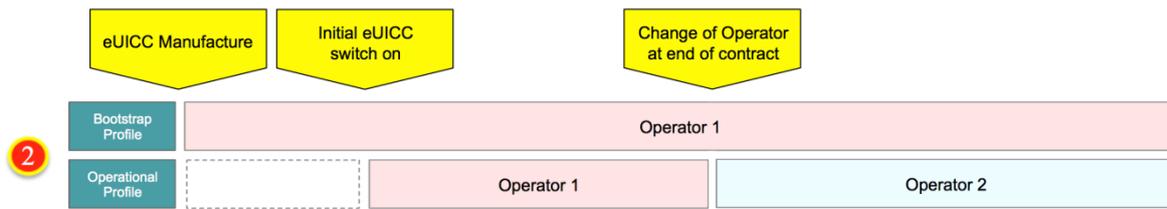
**Figure 5: Deployment Model 1 – Single operator provider**

In this model, an enabled Bootstrap Profile provided by Operator 1 is included on the eUICC during manufacture. There is no Operational Profile at this time. At initial switch on of the eUICC the Bootstrap Profile on this eUICC provides connectivity for the M2M device, which allows Operator 1 the ability to download and activate an Operational Profile, via Process 2, described later in this document.

At the end of the contract (or agreed minimum contractual period), should the M2M OEM wish to change Operator, Process 1A, or Process 1B), both described later in this document, can be used to effect a change of both Bootstrap and Operational Profile from Operator 1 to Operator 2.

### 4.2 Model 2 – Lifetime bootstrap provider

The following diagram is a pictorial representation of Deployment Model 2:



**Figure 6: Model 2 – Lifetime bootstrap provider**

In this second model, an enabled Bootstrap Profile provided by Operator 1 is included on the eUICC during manufacture for the service lifetime of the eUICC. Again, there is no Operational Profile at this time. At initial switch on of the eUICC the Bootstrap Profile on this eUICC provides connectivity for the M2M device, which allows Operator 1 the ability to download and activate an Operational Profile, via Process 2, described later in this document.

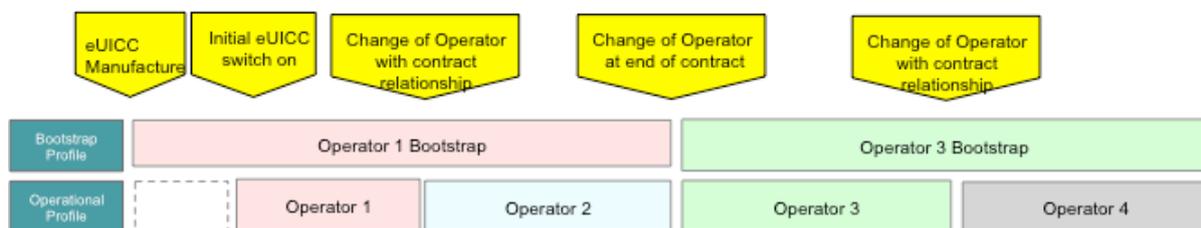
At the end of the contract (or agreed minimum contractual period), should the M2M OEM wish to change Operator, Process 3, described later in this document, can be used to effect a change of only the Operational Profile from Operator 1 to Operator 2. The Bootstrap Profile remains under the management of Operator 1.

For this deployment model to be implemented the following conditions must be met:

1. There can only be one SM\_SR active on each eUICC
2. Operator 1 must be a connectivity provider
3. There must be an agreed transfer plan between Operator 1 and Operator 2; and if there are further changes to other Operators (3, 4, 5 etc.) transfer plans must be in place prior to the switch

**4.3 Model 3 - Concerted Operators**

The following diagram is a pictorial representation of an operator deployment model where a contractual relationship exists between a defined group of operators (e.g. in an alliance) in the picture operator 1 & 2 have a contractual agreement, in the same way as operator 3 & 4 after the change of contract:



**Figure 7: Model 3 - Concerted Operator Deployment Model**

In this second model, an enabled Bootstrap Profile provided by Operator 1 is included on the eUICC during manufacture. Again, there is no Operational Profile at this time. At initial switch on of the eUICC the Bootstrap Profile on this eUICC provides connectivity for the M2M device, which allows Operator 1 the ability to download and activate an Operational Profile, via Process 2, described later in this document. The operational profiles that could be used are part of the contracts established between the operators (1&2 or 3&4) and their use will

depend on contractual terms established with the OEM and linked most probably for geographical and economic reasons in order to provide a better service that suites the regulation requirements of a given geography. The transfer of profile between operators with these pre-existing relationship is detailed in process 3.

At the end of the contract (or agreed minimum contractual period), should the M2M OEM wish to change Operator Process 1A, or Process 1B, both described in this document, can be used to implement the change. As soon as implemented, a new bootstrap could be downloaded by operator 3 and use the operational profiles of his own or other operator he may have contracts with (operator 4 in the picture).

## 5 Business Processes

This section contains the list of example business process flows relating to the management of remote SIM provisioning services in M2M.

Note: Which business flow to be referred to and the nature of the related business agreement between OEM and Operator are out of scope of this document.

The following flows are shown:

- Process 1A - Transfer of Operator at end of contact
- Process 1B - Managing Operator initiates the profile swap
- Process 2 – Operator profile swap with concerted Operators
  - The flows assume the case that at end of contract (or end of the agreed minimum term) the OEM wishes to move connectivity services to another Operator
- Process 3 – Fall back process

### 5.1 Process 1A -Transfer of Operator at end of contact

In this process the OEM makes contact with Operator 2 initially

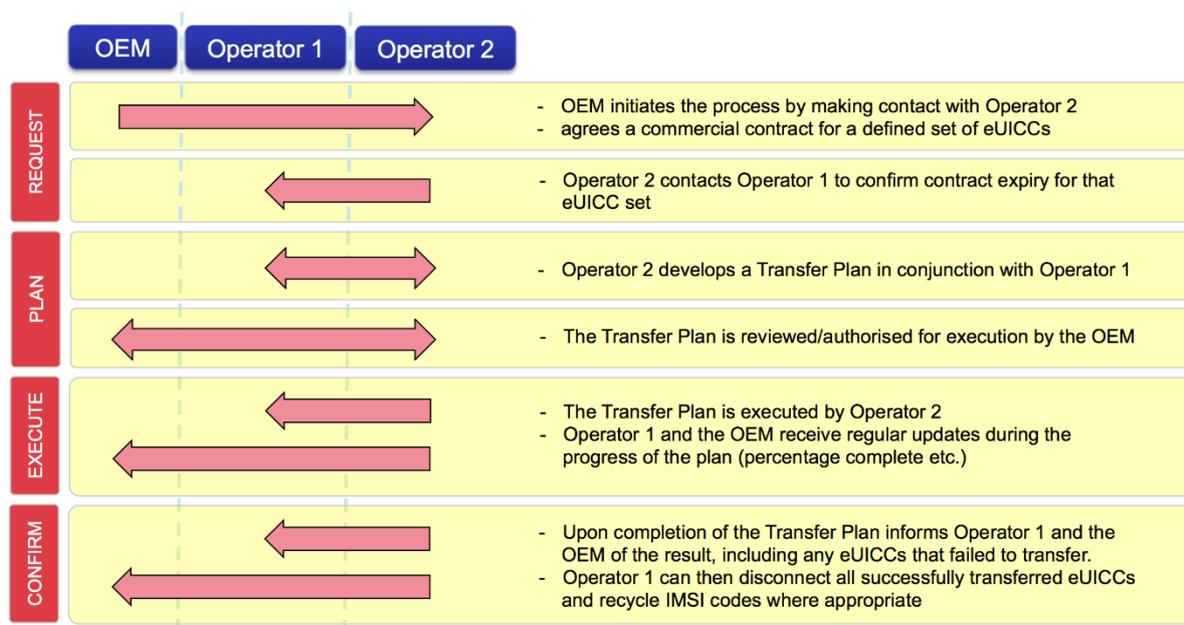
#### 5.1.1 Actors

The following actors are involved with this process:

- OEM – the entity that is providing M2M service to the end customer using a device containing an eUICC
- Operator 1 – the Operator that is currently managing connectivity for a particular OEM device.
- Operator 2 – the Operator that the OEM wishes to transfer to at the end of contract.

#### 5.1.2 High level description

The following diagram represents the business process at a high level:



**Figure 8: Transfer of Operator at end of contact (1A)**

### 5.1.3 Process stage description

This section details each of the stages in the high level description.

#### 5.1.3.1 Stage 1 – REQUEST

In this stage the OEM initiates the process, by first contacting Operator 2, informing them that they wish to move services for a defined set of eUICCs from Operator 1 to Operator 2.

##### 5.1.3.1.1 Prerequisites

- There are no contractual obligations between the OEM and Operator 1 that prevent this process from occurring.
- Any and all contractual obligations between the OEM and Operator 1 prior to such a transfer are enacted.
- Any optional process is complete.
- A commercial contract has been developed and agreed between the OEM and Operator 2.
- Profile verification from Operator 2 is complete.
- Any and all contractual obligations as well as operational setup between Operator 2 and the OEM are complete. (E.g. integration of provisioning, billing, customer service setup, etc.)
- Any and all integration required to support the transaction flow for swapping active profiles are complete between Operator 1 and Operator 2 are complete.
- Policy Rules as described in Annex A have been considered for the profile swap plan.

##### 5.1.3.1.2 Steps

- The OEM initiates the process by making contact with Operator 2.
- Operator 2 contacts Operator 1 for the set of eUICCs to be transferred.
  - Notification of set of eUICCs to be transferred.

- Confirmation that this is free from any contractual obligations to remain under the control of Operator 1.

### **5.1.3.2 Stage 2 – PLAN**

This stage primarily involves an interaction between Operator 2 and Operator 1, to agree how and when the transfer will take place, using a formal Transfer Plan, defined later in this document.

#### **5.1.3.2.1 Prerequisites**

- Stage 1 – REQUEST is complete.

#### **5.1.3.2.2 Steps**

- Operator 2 works with Operator 1 to develop a formal Transfer Plan
  - This plan is based on the Transfer Plan Template in Annex B
  - There may be other elements to be included in the Transfer Plan depending on the actual service(s) provided by Operator 1 that need to be taken into consideration.
  - Operator 2 and Operator 1 agree on the developed Transfer Plan taking into account the Policy Rules as described in Annex A.
- Operator 2 informs the OEM of the agreed Transfer Plan
- The OEM agrees and signs off on the Transfer Plan

### **5.1.3.3 Stage 3 – EXECUTE**

In this stage the agreed Transfer Plan is executed by Operator 2, with Operator 1 and the OEM receiving regular updates during that execution period.

#### **5.1.3.3.1 Prerequisite**

- Stage 2 – PLAN is complete.

#### **5.1.3.3.2 Steps**

- Operator 2 executes the Transfer Plan.
  - Operator 2 informs both Operator 1 and the OEM of the progress of that execution at the start, regular points during and at the end. This will be co-ordinated between both Operators and the OEM

### **5.1.3.4 Stage 4 – CONFIRM**

#### **5.1.3.4.1 Prerequisite**

- Stage 3 – EXECUTE is complete.

#### **5.1.3.4.2 Steps**

- Operator 2 informs Operator 1 and OEM that the Transfer Plan has been completed.
- Operator 2 informs Operator 1 and OEM of eUICCs that failed to transfer.
- Operator 1 will then disconnect all successfully transferred eUICCs and recycle IMSI codes where appropriate

## 5.2 Process 1B - Managing operator initiates profile swap

In this process the OEM makes contact with Operator 1 initially. This may be due to Operator 1 having an ongoing contract with the OEM to manage connectivity for the OEM, even if another Operator’s profile is used due to regulatory or other reasons. It may also be due to contractual obligations for the OEM to work with Operator 1 first before implementing an Operator change.

### 5.2.1 Actors

The following actors are involved with this process:

- OEM – the entity that is providing the M2M service provider using a device containing an eUICC to the end customer.
- Operator 1 – the Operator that is currently managing connectivity for a particular OEM device.
- Operator 2 – the Operator whose profile will reside on the card at the end of the process.

### 5.2.2 High level description

The following diagram represents the business process at a high level:

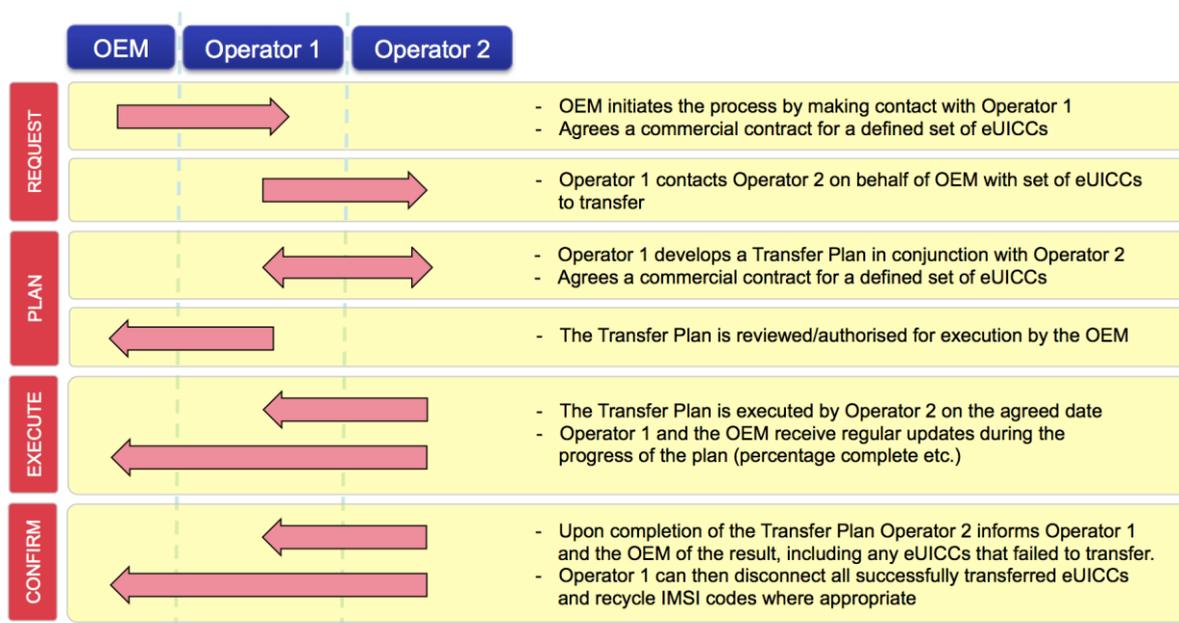


Figure 9: Transfer of Operator at end of contract (1B)

This section details each of the stages in the high level description.

#### 5.2.2.1 Stage 1 – REQUEST

In this stage the OEM initiates the process, by first contacting Operator 1, informing them that they wish to move service for a defined set of eUICCs from Operator 1 to Operator 2.

##### 5.2.2.1.1 Prerequisites

- There are no contractual obligations between the OEM and Operator 1 that prevent this process for occurring.

- Any and all contractual obligations between the OEM and Operator 1 prior to such a transfer are enacted.
- Any optional process is complete.
- A commercial contract has been developed and agreed between OEM and Operator 2.
- Profile verification from Operator 2 is complete.
- Any and all contractual obligations as well as operational setup between Operator 2 and OEM are complete. (E.g. integration of provisioning, billing, customer service setup, etc.)
- Any and all integration required to support the transaction flow for swapping active profiles are complete between Operator 1 and Operator 2 are complete.
- Policy Rules as described in Annex A have been considered in the profile swap plan.

#### **5.2.2.1.2 Steps**

- The OEM initiates the process by making contact with Operator 1.
- Operator 1 contacts Operator 2 for the set of eUICCs to be transferred.
  - Notification of set of eUICCs to be transferred.
  - Confirmation that this is free from any contractual obligations to remain under the control of Operator 1.

#### **5.2.2.2 Stage 2 – PLAN**

This stage primarily involves interaction between Operator 2 and Operator 1, to agree how and when the transfer will take place, using a formal Transfer Plan, defined later in this document.

##### **5.2.2.2.1 Prerequisites**

- Stage 1 – REQUEST is complete.

##### **5.2.2.2.2 Steps**

- Operator 1 works with Operator 2 to develop a formal Transfer Plan
  - This plan is based on the Transfer Plan Template in Annex B
  - There may be other elements to be included in the Transfer Plan depending on the actual service(s) provided by Operator 1 that need to be taken into consideration.
  - Operator 1 and Operator 2 agree on the developed Transfer Plan taking into account the Policy Rules as described in Annex A..
- Operator 1 informs the OEM of the agreed Transfer Plan where OEM requirements are reflected

#### **5.2.2.3 Stage 3 – EXECUTE**

In this stage the agreed Transfer Plan is executed by Operator 2, with Operator 1 and the OEM receiving regular updates during that execution period.

##### **5.2.2.3.1 Prerequisite**

- Stage 2 – PLAN is complete.

#### **5.2.2.3.2 Steps**

- Operator 2 executes the Transfer Plan.
  - Operator 2 informs both Operator 1 and the OEM of the progress of that execution at the start, regular points during and at the end. This will be co-ordinated between both Operators and the OEM

#### **5.2.2.4 Stage 4 – CONFIRM**

##### **5.2.2.4.1 Prerequisite**

- Stage 3 – EXECUTE is complete.

##### **5.2.2.4.2 Steps**

- Operator 2 informs Operator 1 and the OEM that the Transfer Plan has been completed.
- Operator 2 informs Operator 1 and the OEM of the eUICCs that failed to transfer.
- Operator 1 will then disconnect all successfully transferred eUICCs as appropriate and recycle IMSI codes where appropriate

### **5.3 Process 2 - Operator Profile Swap with Concerted Operators**

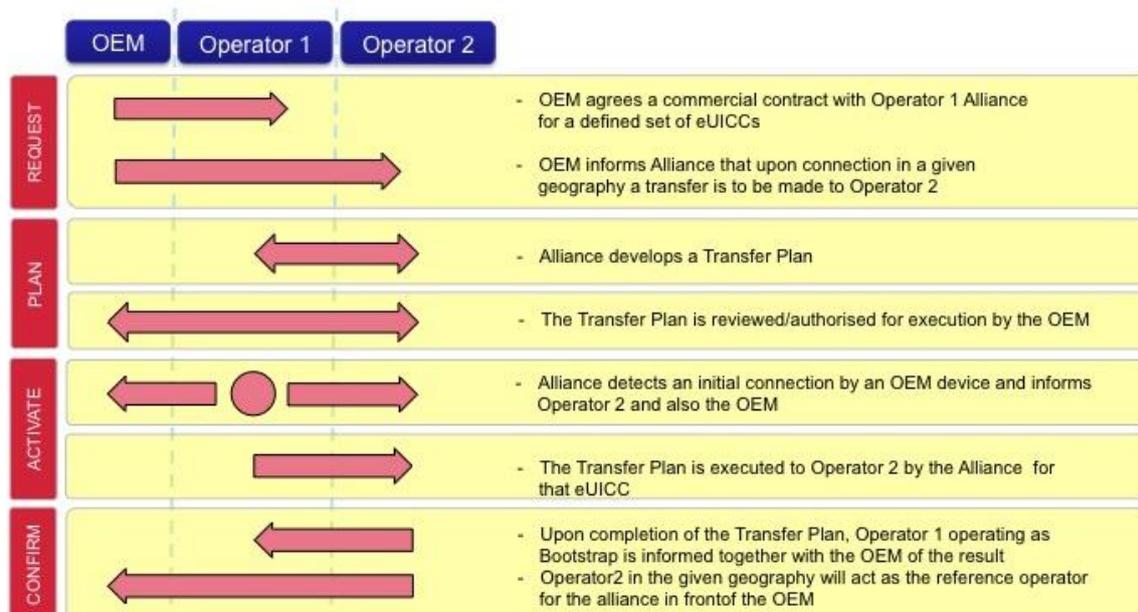
An OEM using an eUICC on its devices will most probably like to provide a global service in many countries. If the OEM has chosen to deploy the latter with the Alliance model, then different operator profiles may be used in order to comply with for example regulations that require the provision of a service using a local network in a given country. In that case the pertaining devices' eUICCs will have to be activated with different profiles of operators being part of the Operator Alliance that has signed the contract with the OEM.

#### **5.3.1 Actors**

- OEM – The provider of the M2M device containing an eUICC.
- Operator 1 – The Operator providing a Bootstrap service for the Operator Alliance
- Operator 2 – The Operator that the OEM wishes to use to manage connectivity for the device in a given geography.

#### **5.3.2 High Level Description**

The following diagram represents the business process at a high level:



**Figure 10: Concerted Operator Swap Process**

### 5.3.2.1 Stage 1 – REQUEST

The OEM requests to the operators participating in the concerted mode to manage and swap their profiles on the eUICCs following pre-agreed business rules.

In this way, Profile swaps can be implemented in different geographies as exemplified in the above figure.

#### 5.3.2.1.1 Prerequisites

- The concerted operators have an integrated solution for Subscription Management and have a connectivity contract with the OEM.
- The OEM and the operators have agreed on how the profile swaps are to be executed between all participating operators
- Policy Rules as described in Annex A have been considered for the profile swap plan.
- Business rules have been defined by all parties to manage and swap profiles.
- Profile verification and certification from all participating operators is complete in order to guarantee the correct operation on the eUICCs.

#### 5.3.2.1.2 Steps

- The OEM contacts eUICC management and connectivity with a given set of operators acting in a concerted mode.
- The OEM agrees with the operators how to manage and swap profiles in their footprint.

### 5.3.2.2 Stage 2 – PLAN

This stage involves interaction between the concerted operators in order to define how profiles are to be managed across the eUICCs following the agreed rules with the OEM.

#### **5.3.2.2.1 Prerequisites**

- Stage 1 – REQUEST is complete.

#### **5.3.2.2.2 Steps**

- The concerted operators agree how to manage and swap their profiles in the eUICCs deployed by the OEM, taking into account the Policy Rules as described in Annex A..
- Operator 1 (Leading operator) informs the OEM of the agreed eUICC Swap Plan where OEM requirements are reflected.

#### **5.3.2.3 Stage 3 – ACTIVATE**

In this stage a profile swap is implemented on a given eUICC managed by the contracted operators.

##### **5.3.2.3.1 Prerequisite**

- Stage 2 – PLAN is complete.

##### **5.3.2.3.2 Steps**

- The OEM device connection is detected on a geography (country) that requires a swap to be implemented to Operator 2.
- An eUICC profile swap is implemented between Operator 1 and Operator 2 acting in a concerted fashion.

#### **5.3.2.4 Stage 4 – CONFIRM**

##### **5.3.2.4.1 Prerequisite**

- Stage 3 – ACTIVATE is complete.

##### **5.3.2.4.2 Steps**

- After the swap is performed all parties are informed of the result of the swap. This is normally reflected on the management tools available to all parties.
- Operator 2 is now providing the connectivity to the eUICC.

### **5.4 Process 3 - Fall-back process**

Fallback is a process that is part of the GSMA remote provisioning technical specification [1], it is entered whenever an action is performed on the eUICC trying to download and enable a given profile but the network connectivity is lost in any of the Deployment Models explained in chapter 4. If such a case happens, the eUICC will then swap the failing profile, to a profile that has the fallback parameter set as active. This is a recovery and security process that tries to guarantee the connectivity of an eUICC at all times.

The Fallback profile is to be chosen carefully by the operator or alliance providing the connectivity in order to guarantee a good backup profile in case of failure.

This profile may also change during the lifetime of a eUICC, to satisfy new network requirements or the quality and liability requirements of a new MNO framework taking over the connectivity responsibility of the given eUICC after contract termination for example.

### 5.4.1 Actors

- OEM – The provider of the M2M device containing an eUICC.
- Operator 1 – The owner of the profile with Fallback attributes set as defined in SGP.02[1].

### 5.4.2 High Level Description

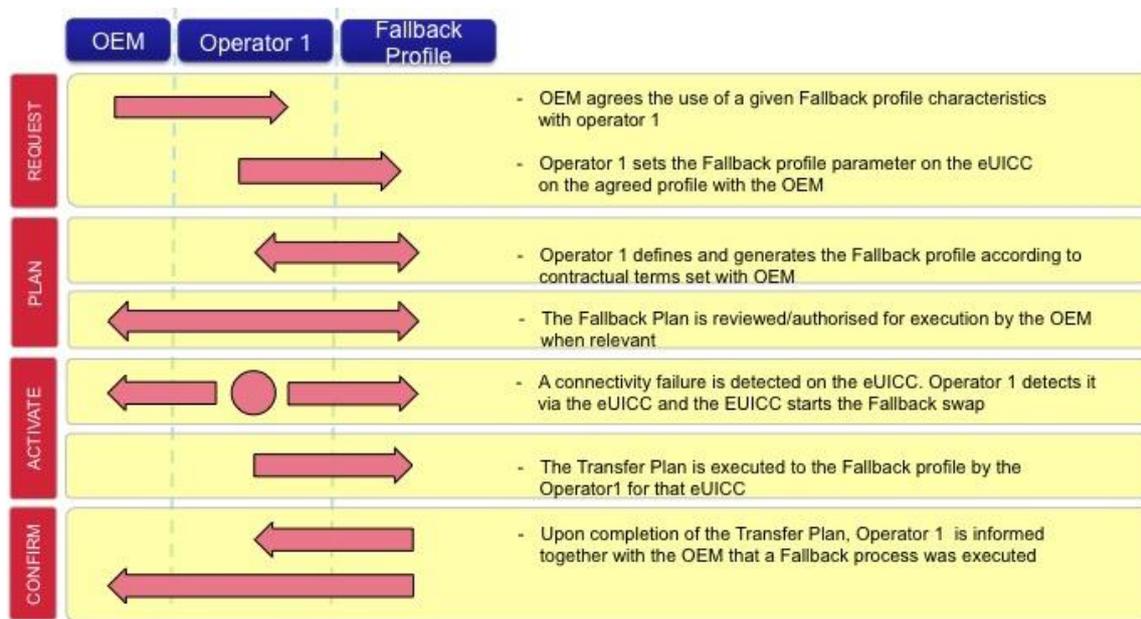


Figure 11: Fall-back Process

#### 5.4.2.1 Stage 1 – REQUEST

The OEM and Operator 1 agree on the use of an Operational Profile with Fallback Attribute set in order to provide recovery when a failure is detected while managing profiles on the eUICC.

##### 5.4.2.1.1 Prerequisites

- Operator 1 has a connectivity contract with the OEM for the management of eUICCs.
- The main connectivity profiles have been agreed.
- Policy Rules as described in Annex A (POL1 of the Enabled Profile) shall be ignored for the profile swap plan

##### 5.4.2.1.2 Steps

- The OEM agrees the use of a given Operational Profile with Fallback Attribute set with Operator 1
- Operator 1 sets the Fallback Attribute for the agreed Operational Profile on the eUICC on the agreed profile with the OEM

#### 5.4.2.2 Stage 2 – PLAN

Operator 1 defines a process on how to set up the Fallback profiles on the deployed eUICCs.

#### **5.4.2.2.1 Prerequisites**

- Stage 1 – REQUEST is complete.

#### **5.4.2.2.2 Steps**

- Operator 1 defines and generates the Operational Profile with Fallback Attribute set according to contractual terms set with the OEM.
- The POL1 as described in Annex A shall be ignored for this plan.
- The Fallback Plan is reviewed/authorised for execution by the OEM when relevant.

#### **5.4.2.3 Stage 3 – ACTIVATE**

The needed processes for downloading and activating the Fallback attributes on the deployed eUICCs are implemented, thereby allowing any eUICC experiencing a connection failure during profile management will perform the Fallback process.

##### **5.4.2.3.1 Prerequisite**

- Stage 2 – PLAN is complete.

##### **5.4.2.3.2 Steps**

- Operator 1 downloads onto the eUICCs and sets the Fallback attribute on the chosen profiles
- When a failure is detected, the Fallback procedure is activated on the relevant eUICCs

#### **5.4.2.4 Stage 4 – CONFIRM**

Whenever a Fallback process was implemented on any of the deployed eUICCs, the result is confirmed to Operator 1 and OEM through the available management tools.

##### **5.4.2.4.1 Prerequisite**

- Stage 3 – ACTIVATE is complete.

##### **5.4.2.4.2 Steps**

- Upon completion of the Fallback procedure, Operator 1 and the OEM are informed about the result on the available management tools
- The relevant eUICCs are connected via the Operational Profile with the Fallback attribute set

## Annex A Policy Rules

Policy rules, as it relates to a Profile, is required by the MNO to be set and update. Only the MNO which is the owner of the Profile is able to modify the Policy Rules. The MNO can update the Policy Rules within his Profile using his own OTA Platform(s). Updating can only be done when the Profile is in enabled state.

The enforcement of these rules lies with different entities. There are two types of rules:

Policy Type	Enforced at (entity)	Resides on
POL1	eUICC	Profile
POL2*	SM-SR	SM-SR

\*The MNO sends POL2 directly to the SM-SR or through the SM-DP for attaching as part of a Profile.

POL1 and POL2 are representations of a common MNO Policy in different locations/entities. The combination of POL1 and POL2 represent the contract between an MNO and a Customer as applied to the Profile.

The following Policy Rules are defined within [1] and [2]:

#	Policy Rules	Subject	Action	Qualification	Enforcement when the Profile is
1	Disabling of this Profile not allowed	Profile	Disable	Not allowed	Enabled
2	Deletion of this Profile not allowed	Profile	Delete	Not allowed	Enabled or Disabled
3	Profile deletion is mandatory when it is disabled.	Profile	Disable	Auto-delete	N/A

Any other combination shall be treated as **not valid** regarding this specification release.

The policy rules settings at POL1 and POL2 may or may not be the same. POL1 and POL2 are enforced by different entities and will be enforced independently.

The explicit setting of POL1 and POL2 rules is the choice of the MNO (e.g. to set POL1 rules to be empty).

## Annex B Transfer Plan Template

This annex provides a template that can be used as the basis for a Transfer Plan, to be used in conjunction with one or more of the business processes in this document.

The Transfer Plan comprises two parts:

1. A form detailing the minimum information required in order for the Transfer Plan to execute.
2. A series of steps, representing the plan itself.

### B.1.1 Prerequisite Information Form

The following form details all of the information required in order for the Transfer Plan to be ready for execution.

FILL ONE FORM PER eUICC SET		
Transfer information	Description	
Set of eUICC identifiers		
eUICC security keys		
Host SR		
Operator 1, primary contact and details		
Operator 2, primary contact and details		
OEM, primary contact and details		
Provider information	Current	New
Bootstrap provider		
Operational provider		
Fall back operator		
SM-SR operator		

### B.1.2 Transfer Plan Steps

Step 1	Identify the following: <ol style="list-style-type: none"> <li>1. OEM</li> <li>2. Operator 1</li> <li>3. Operator 2</li> <li>4. eUICC set</li> <li>5. Existing keys</li> <li>6. Will there need to be an SM-SR transfer?</li> <li>7. Is the existing bootstrap be replaced?</li> </ol>
Step 2	Operator 2 creates a suitable Operational Profile for download onto the first (or next) eUICC in the set.
Step 3	Operator 2 connects to the SM-SR managing the eUICC, using credentials provided by Operator 1.

Step 4	<p>Operator 2:</p> <ul style="list-style-type: none"> <li>• downloads the Operational Profile into the eUICC (subject to current Policy Rules)</li> <li>• enables that Operational Profile and defines the Policy Rules that control the Profile management.</li> <li>• deletes Operator 1's Operational Profile from the eUICC if allow by Operator 1's Operational Profile Policy Rules (POL1)</li> </ul>
Step 5	Operator 2 confirms that it's Operational Profile has successfully connected to the network once the eUICC has completed its REFRESH procedure.
Step 6	Operator 2 creates a suitable Bootstrap Profile for download onto the eUICC.
Step 7	<p>Operator 2:</p> <ul style="list-style-type: none"> <li>• downloads the Bootstrap Profile into the eUICC</li> <li>• deletes Operator 1's Bootstrap Profile from the eUICC if:             <ol style="list-style-type: none"> <li>1. allows by POL1 of the Operator 1's Bootstrap Profile</li> <li>2. The Operator 1's Bootstrap Profile is not the one with the Profile Fall-back Attribute</li> </ol> </li> </ul>
Step 8	Operator 2 performs an SM-SR swap from Operator 1 to Operator 2 and define a POL2 on the Profile. The MNO shall be able to sign the POL2 content even if it is empty.
Go to Step 2 if there are more eUICCs in the set to be transferred.	
Step 9	Operator 2 informs Operator 1 and the OEM of the result.

## Annex C Document Management

### C.1 Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.0	12/01/15	New white paper drafted and submitted for QA and legal review	Embedded SIM/PSMC	Craig Aldridge, GSMA

### C.2 Other Information

Type	Description
Document Owner	Embedded SIM Deployment Project
Editor / Company	Craig Aldridge, GSMA

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Your comments or suggestions & questions are always welcome.