Embedded Mobile

GSMA Embedded SIM
9th December 2013

Accelerating growth and operational efficiency in the M2M world

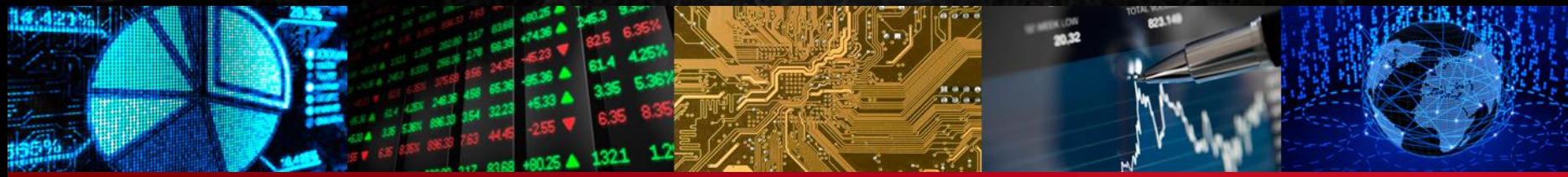
Purpose of this Reference Messaging Pack

- Appropriate slides may be selected to used for within different presentations for multiple audiences
- To provide consistent and accurate messaging for the GSMA Embedded SIM specification
- To be distributed widely for use by GSMA staff, Operators, Vendors and Industry partners
- To provide a central reference slide pack which will be kept up to date with appropriate changes as required

Contents

GSMA Embedded SIM – Essential benefits

- Accelerating the market growth of Machine to Machine (M2M)
- Increasing operational efficiency for the M2M ecosystem
- Enabling remote or 'over the air' installation and management of operator profiles
- Cutting operational and physical logistics costs
  - No need to ship physical SIMs
  - No need to change physical SIM for entire product lifetime
- Enables new business models
- Preventing market fragmentation by avoiding different, incompatible technical solutions
- Driving economies of scale within the M2M industry

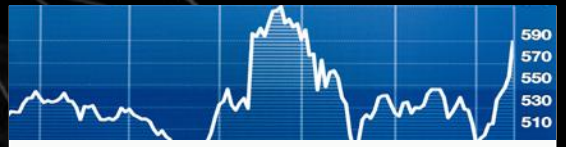


Accelerating growth and operational efficiency in the M2M world

GSMA Embedded SIM - Description

The GSMA Embedded SIM h as been developed to promote a common global remote provisioning architecture for the new era of machine to machine technology.

Backed by the world's largest mobile providers and endorsed by the world's largest SIM suppliers, this is a technical specification that will enable 'over the air' installation and management of operator profiles.



This specification will accelerate the M2M market and increase opportunities for operators and M2M customers around the globe by reducing costs and improving flexibility and efficiency as it drives the economies of scale.

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Accelerating M2M Growth

By 2020, handsets will constitute only **70%** of cellular connections (currently 92%)

Growth will come from connected **M2M devices** – estimated to be **14 Billion*** by **2020**

- 691 Million Healthcare Devices (Up from 39 Million in 2012)
- 1.1 Billion Automotive Devices (Up from 110 Million in 2012)
- 6.4 Billion Smart Cities Devices

Accelerates M2M growth

- By cutting operational costs and increasing flexibility
- Enable longer term planning and higher returns from business models
- By implementing industry leading security standards to maintain consumer confidence

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* All connection types Source Machina Research

Broad based industry support

- GSMA represents the global mobile industry
  - Membership comprised of 800 mobile operators with more than 230 companies in the mobile industry
  - Helping businesses in all industry sectors – financial services, healthcare, media, transport, utilities and more
  - Spanning more than 220 countries
- GSMA is working in partnership with leading mobile operators and SIM suppliers worldwide
- Specification supported by:

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Advantages over current SIM Cards

- For many M2M applications, use of traditional SIM cards is problematic because the M2M modems are often inaccessible making it difficult to insert or change SIM cards once the modem is deployed in the field.
- Use of Embedded SIMs which enable operator profiles to be remotely provisioned overcomes these restrictions
- The Embedded SIM simplifies logistical processes by enabling the installation of SIM capability into an M2M modem at point of manufacture which can later be remotely provisioned with an operator profile
- Embedded SIM removes the need for stock control and shipping of physical pre-provisioned SIM cards
- This operational flexibility is delivered with no compromise on security.

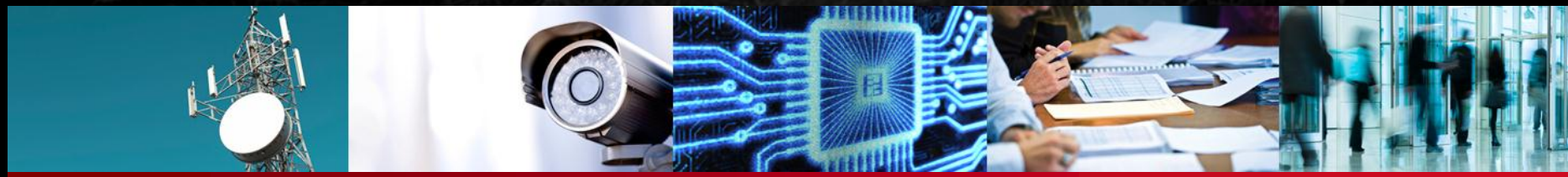
Global compatibility is important for scaling the market

- The GSMA goal is to grow the M2M Industry and put a standard Embedded SIM at the centre of that growth
- Different, incompatible technical implementations of Embedded SIM will stifle growth
- One global Embedded SIM specification will avoid market fragmentation and drive economies of scale for all stakeholders
- Supports development of strong, global M2M ecosystem unifying operators, SIM suppliers and vendor partners

Benefits for all stakeholders

Operators | M2M Product Manufacturers | SIM Suppliers | Business Customers | End Consumers

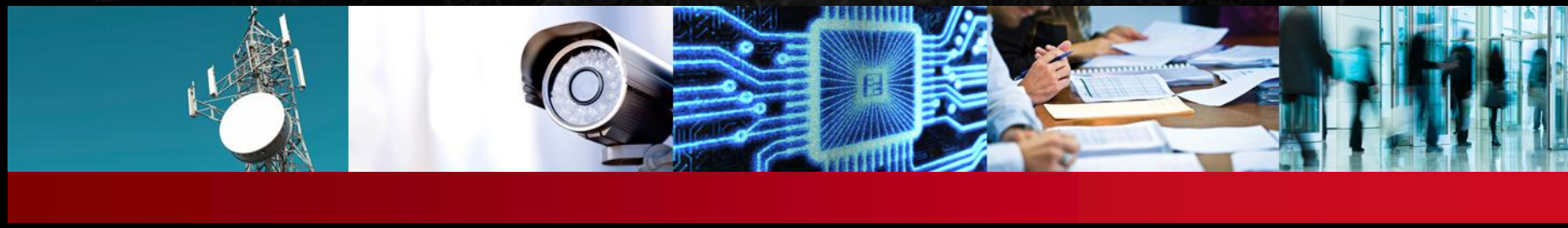
- Opens up new market opportunities
- Reduced costs in handling SIM cards
- Industry leading security levels
- Minimal impact to existing systems & network infrastructure
- Low integration and testing costs



Benefits for all stakeholders

Operators	**M2M Product Manufacturers**	SIM Suppliers	Business Customers	End Consumers

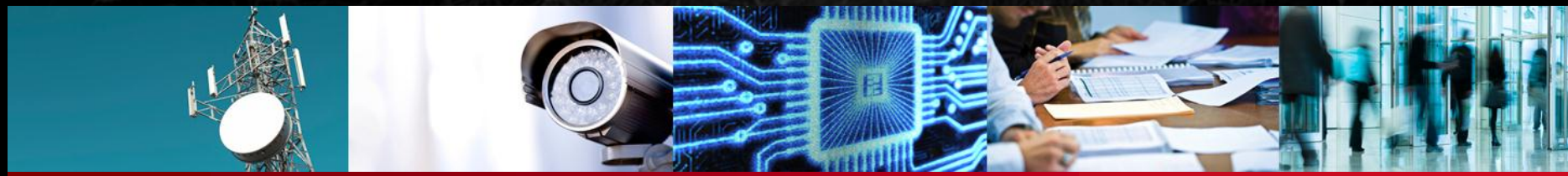
- Opens up new M2M market opportunities
- No need for product personalisation at factory – can be done in field
- Potential space saving as SIM can be soldered reducing need for mechanical SIM holder and slot
- Improved product reliability as products can be hermetically sealed



Benefits for all stakeholders

Operators	M2M Product Manufacturers	**SIM Suppliers**	Business Customers	End Consumers

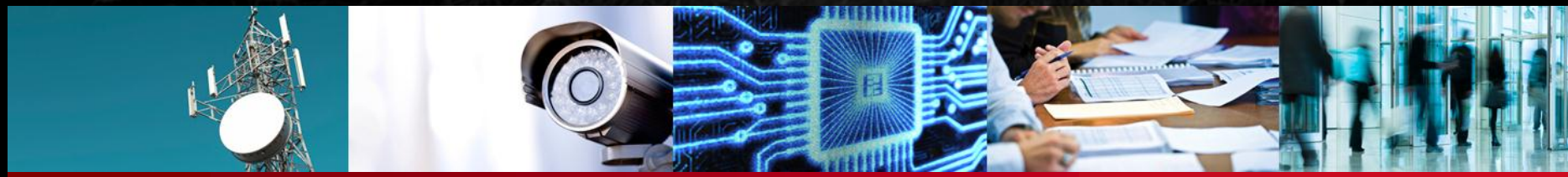
- Add value by providing infrastructure and services to remotely manage SIMs
- Add flexibility to current SIM products
- Opens up new M2M market opportunities



Benefits for all stakeholders

Operators	M2M Product Manufacturers	SIM Suppliers	**Business Customers**	End Consumers

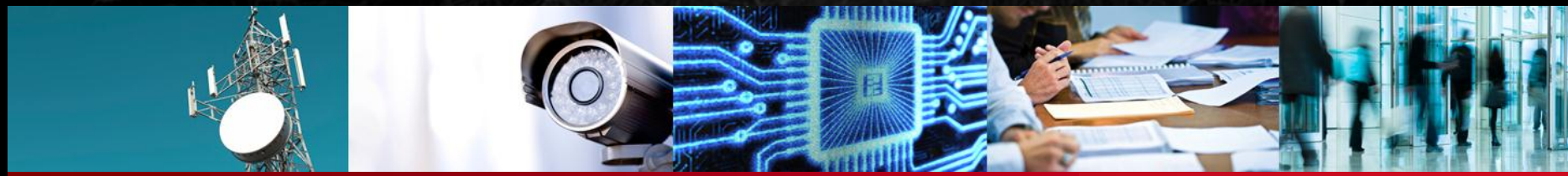
- Business opportunities from new M2M connected services inc. new business models
- Remote service activation enables the up-sell of connected options after initial sale
- Connectivity management will be more flexible and cost effective



Benefits for all stakeholders

Operators	M2M Product Manufacturers	SIM Suppliers	Business Customers	End Consumers

- Improved customer experience – products more likely to work ‘out of the box’
- Lower cost connected products
- Increase in number of valuable connected services

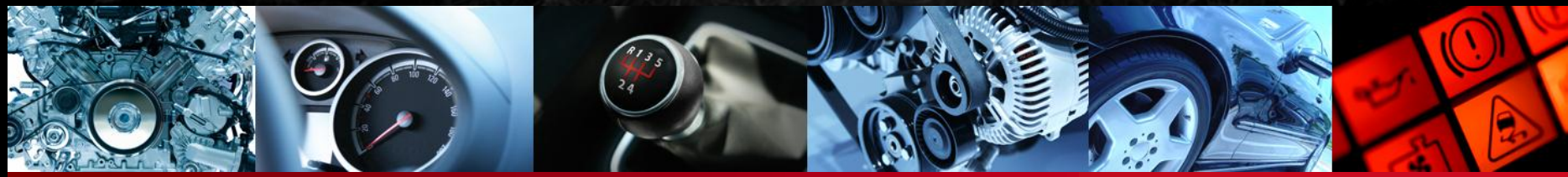


Automotive is leading the way

- Embedded SIM technology is revolutionising the motoring experience. SBD predicts almost all new cars will have connectivity by 2025
- Connected Car Market will be worth almost €40 billion globally in 2018 (up from €13 billion in 2012)
- According to SBD Research, 83% of this growth is due to embedding SIM technology into new vehicles
- Enabling a wide range of mobile based services in safety, security, navigation, traffic updates and infotainment

Opportunities for Automotive

- Embedded SIM technology offers big opportunities for auto manufacturers over the 10-15 year life cycle of a vehicle including:
- The opportunity for late stage operator profile installation based on location
- Profile updates when a vehicle permanently changes ownership or location



Embedded SIM in action - eCall

- European Commission has selected Embedded SIM for its in-vehicle emergency call services mandate – eCall
  - Must be fitted in all new car models in member states by 2015
  - Instantly connects to emergency services in the event of a collision
  - 2016 Expected Sales = 7 million units
- Russia and Brazil also have eCall Plans
  - Russia: With ERA GLONASS regional satellite positioning system
  - Brazil: With SIMRAV anti-theft system

Comparing the automotive options

Components	Embedded	Tethered	Integrated
Communication module	Built-in	Built-in	Brought-in
SIM	Built-in	Brought-in	Brought-in
Intelligence	Built-in	Built-in	Built-in
Services			
Safety			
Security			
Convenience			
Navigation			
Infotainment			
EV			
VRM			
PAYD			
Fleet Management			
Electronic Tolling			

Key: Optimum solution | Acceptable for some services | Not possible or too difficult to implement

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Embedded SIM – Scope of Specification

- **Specification covers**
  - The remote *over the air* provisioning of a one (or more) operator profiles into a SIM.
  - The remote *over the air* enablement /disablement of the operator profile within the SIM, thus enabling a change of active operator.
  - The deletion over the air of an operator profile within a SIM.

- **Operation**
  - To facilitate the secure *over the air* installation of mobile operator credentials into a SIM, two new key network elements have been specified by the GSMA.

Embedded SIM – Scope of Specification

- **Subscription Manager Data Preparation (SM-DP)**
  Role that securely creates and encrypts operator Profiles and then securely installs them into the eUICC

- **Subscription Manager Secure Routing (SM-SR)**
  Role that which enables secure download, enablement, disablement and deletion of Profiles on the eUICC

Uses of Embedded SIM Specification

Provisioning of multiple M2M subscriptions	1	An M2M service provider sets-up subscriptions for a number of connected M2M devices to start telecommunication services with a network operator
Provision of first Subscription with a new M2M device	2	A M2M customer purchases a new type of connected M2M device from a device vendor/ distribution channel
Subscription change	3	A M2M customer changes the subscription for a device to stop services with the current mobile operator and start services with a new mobile operator
Stop subscription	4	A M2M customer sells his device and stops the subscription for services from the current mobile operator
Transfer subscription	5	A M2M customer transfers subscription between devices

The Elements Involved

Embedded SIM

- Functionally identical to a traditional SIM
- At manufacture will have a 'provisioning profile' assigned with secret keys that allows the associated subscription manager to download and manage 'operational profiles' on the eUICC
- The technical specification can accommodate both an initial declaration of the MNO in the eUICC, as well as the selection of a new MNO later. The implementation will depend upon the commercial agreement between the operators and their customers

Subscription Manager

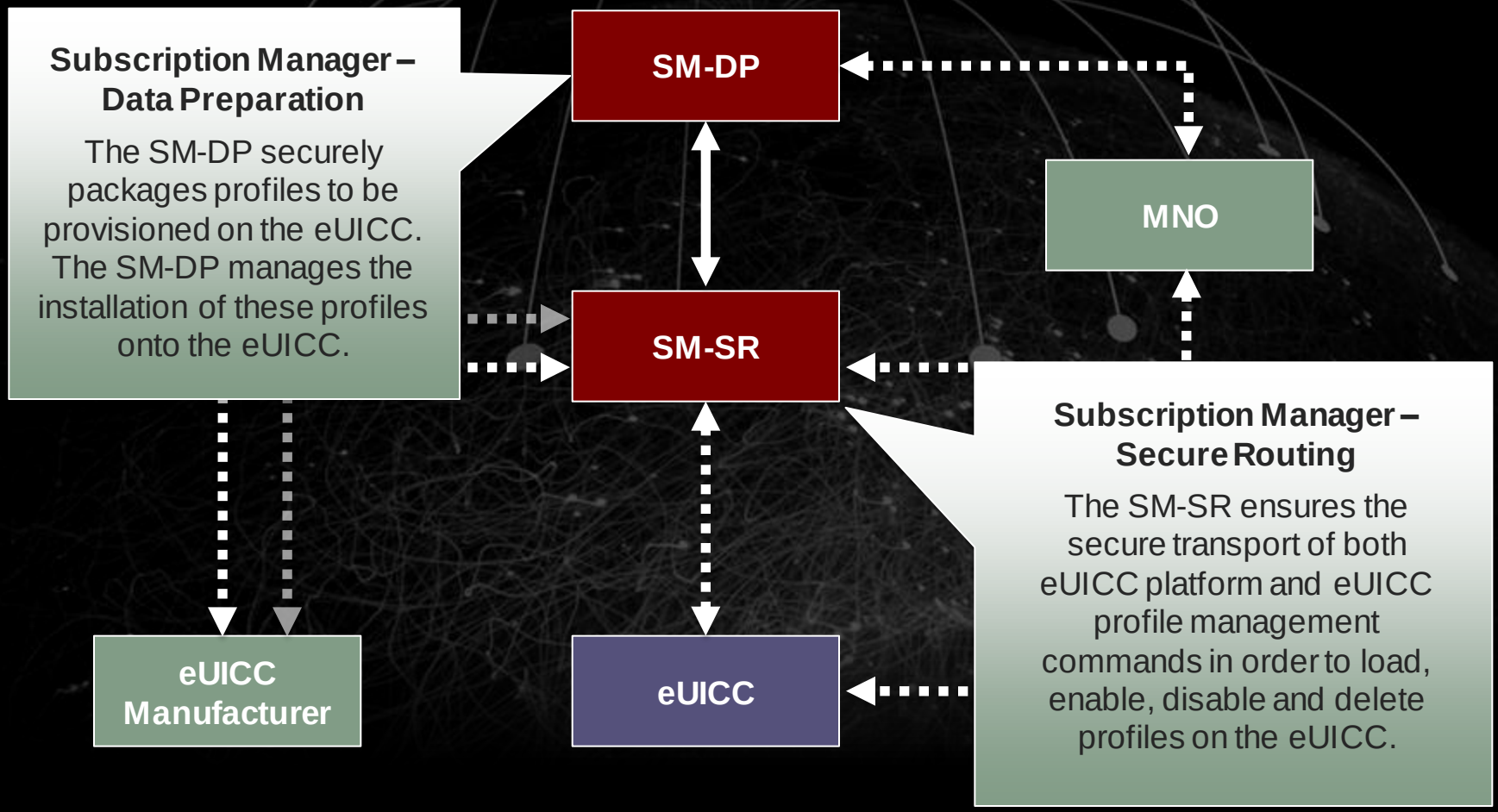
Manages the embedded SIM by

- Generating SIM profiles in real-time
- Management and execution of MNO policy
- Secure routing profiles to the embedded SIM

MNO

- Uses subscription manager to manage profiles
- Maximum re-use of existing provisioning interfaces and processes

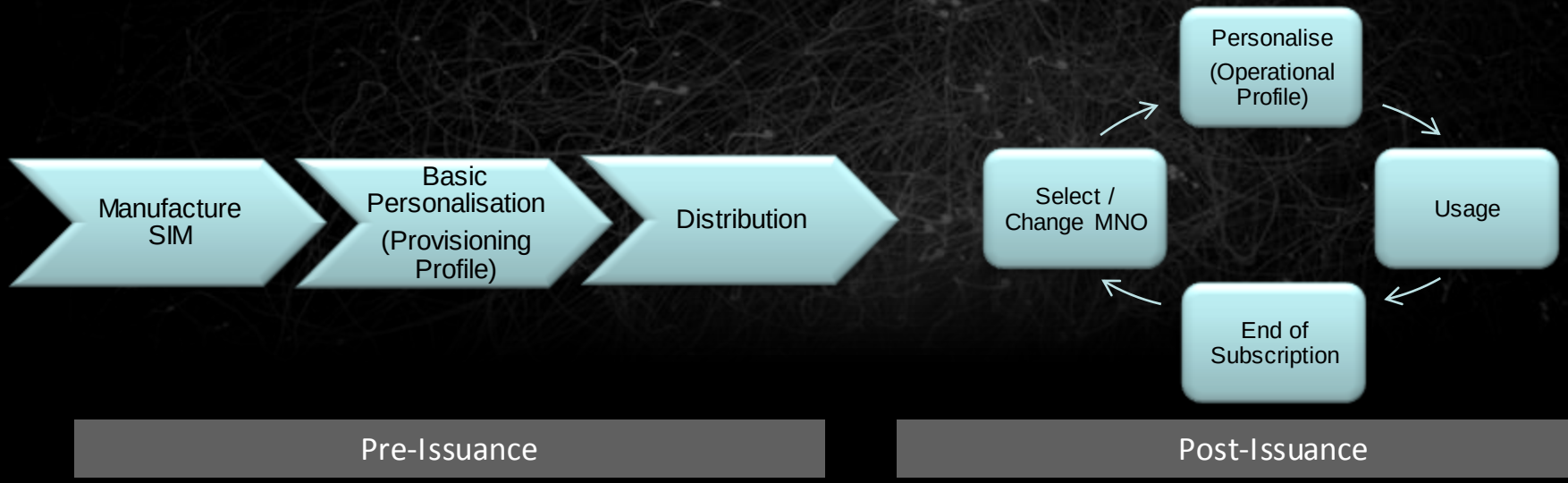
Embedded SIM Basic Architecture



Embedded SIM – A change in SIM Life-cycle Model

From the linear model used today….

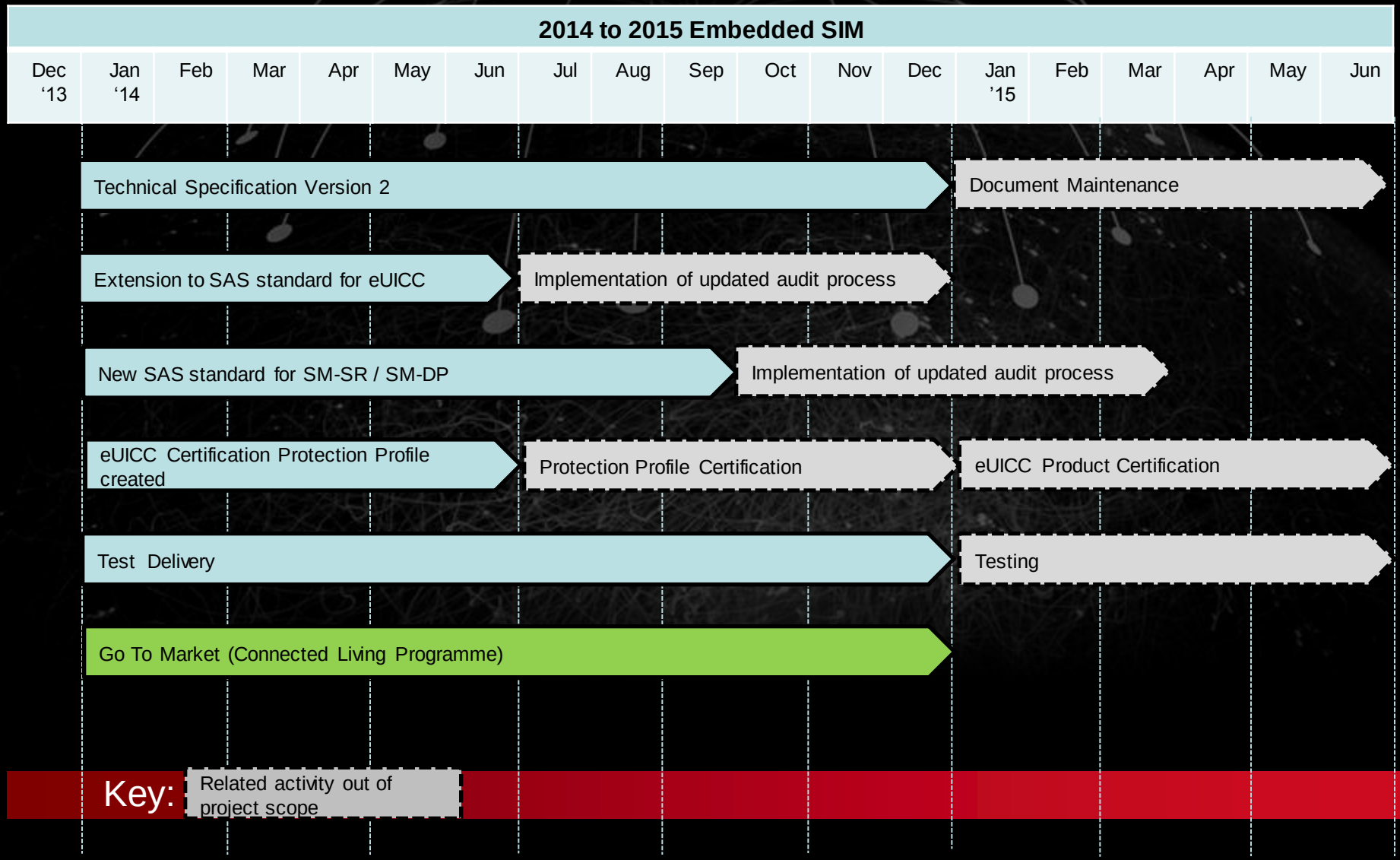
To an outcome based model with repeat provisioning ….



Embedded SIM is NOT a Soft / Virtual SIM

- Embedded SIM embeds existing hardware based UICCs into devices and evolves the existing credential distribution mechanisms into over the air mechanisms:
  - SIMs can be embedded using the new M2M form factors (MFF1, MFF2) or use existing removable SIM form factors such as mini-SIM or micro-SIM
  - By using removable SIM processes and relationships, Embedded SIM can be deployed in the market with maximum speed and appropriate security, as standardised by ETSI
- Soft or Virtual SIM is a completely different concept that does not use existing SIM hardware form factors and it raises a number of strong security issues:
  - Soft SIM would store the Operator secret credentials in software within the Mobile device operating system - the same system that is often attacked to modify the handset IMEI, perform SIM-Lock hacking and 'jail-break' mobile OS's
  - Operators are very concerned about the reduction in security of their credentials through the use of Soft SIM. Any SIM approach not based on a certified hardware secure element will be subject to continual attack by the hacking community and if compromised result in a serious loss of customer confidence in the security of Operator systems
  - Multiple Soft SIM platforms carrying credentials in differing physical platforms, all requiring security certification and accreditation would become an unmanageable overhead – both in terms of resource, and proving their security in a non-standardised virtual environment

Embedded SIM – Forward Timelines



FAQs

- Will Embedded SIM replace the Removable SIM?
- Does this standard have implications for operator churn?
- Who are the core Embedded SIM project members?
- What is the role of the GSMA in relation to ETSI?
- How can I find out more information about the Embedded SIM project progress?

FAQs

- **Will Embedded SIM replace the Removable SIM?**
  - Embedded SIM designed for M2M
  - Removable SIM still offers benefits
    - Familiarity
    - Ease of portability
    - Established ecosystem
    - Proven security model

FAQs

- **Does this standard have implications for operator churn?**
  - As it only applies to M2M solutions, increased churn for existing handset customers will not follow
  - Designed for location/ownership changes
  - New M2M services can tie-in with customer's mobile contract, thereby increasing loyalty

FAQs

- **What is the role of the GSMA in relation to ETSI?**
  - **The GSMA is delivering a pre-standard technical specification for the Embedded SIM to meet the immediate needs of the M2M market.**
  - **The GSMA is very supportive of ETSI activity and believe that ETSI is best placed to produce a long term standard**
  - **ETSI is kept regularly updated on the Embedded SIM project**

FAQs

- **Who are the core Embedded SIM project members?**

FAQs

- **How can I find out more information about the Embedded SIM project progress?**
  - An interest group has been formed for GSMA full members who are not members of the core project team. For more information contact ismith@gsma.com

Media Messaging

- The Embedded SIM specification builds upon existing SIM technology to better support the new requirements of the high growth machine to machine (M2M) market
- Embedded SIM enables new M2M devices to be
  - manufactured more cost effectively
  - remotely activated for simpler customer experience
  - remotely managed for greater service flexibility.
- Enables mobile operators to provide scalable, reliable and secure connectivity for M2M connected devices
- The GSMA has united the mobile operators and SIM suppliers behind a single specification to avoid costly, fragmented & incompatible technical solutions and help accelerate the M2M market