

# IMDA's Standards Development - eSIM

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# AGENDA

1. IMDA's Roles in Standards Development
2. eSIM & How It Works
3. Standardisation Effort for eSIM Technology



# IMDA's Roles in Standards Development



# Key Policy Objectives

## **Create a vibrant infocomm ecosystem**

- Facilitates market access by reducing barriers and increase competition

## **Ensure performance and multi-vendor equipment interoperability**

- Provides assurance and prevents radio frequency interference

## **Establish level of trust for products and services**

- Sets security requirements and check-lists

## **Facilitate new tech deployment**

- Accelerate the adoption of new technologies

  
*Certainty, Choices  
& Interoperability*

### **Standards supporting Digital Transformation can be mandatory or voluntary**

- Mandatory – Setting the baseline, e.g., Ensure interoperability and mitigate interference
- Voluntary – Facilitating the industry development, e.g., Promote sharing of IoT infra and data

# Influence and Adopt International Standards

Adoption of international/regional standards are on voluntary basis

- Enforceable only through individual national regulations

Singapore aligns with International standards

- Contributes and Participates in Key International Standards Bodies



## Small Market

International standards typically set by larger economies

## Technology Advancement

Rapid technology advancement – while working on current standards landscape may have evolved

# Drive Standards Development Locally

## Telecommunications Standards Advisory Committee (“TSAC”)

- IMDA chairs the committee and provides secretariat support
- Focuses on communications standards
- Standards published under IMDA are used to regulate the sale and use of infocomm equipment in Singapore

## Information Technology Standards Committee (“ITSC”)

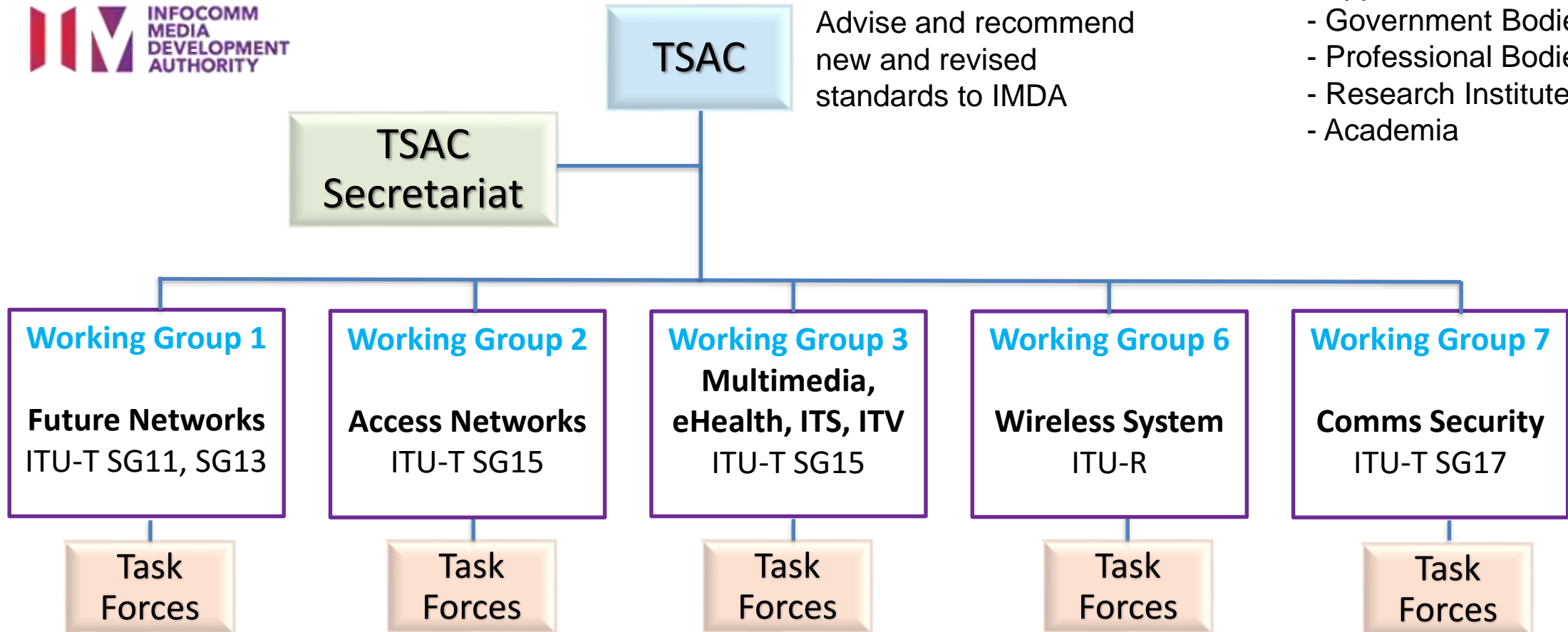
- Chaired by industry with IMDA holding secretariat role
- Focuses on IT specifications
- Functions under Enterprise Singapore’s Singapore Standards Council
- Standards published under Enterprise Singapore and adoptions are of voluntary basis



Telecommunications  
Standards Advisory  
Committee (TSAC)



# TSAC'S Structure



## Membership:

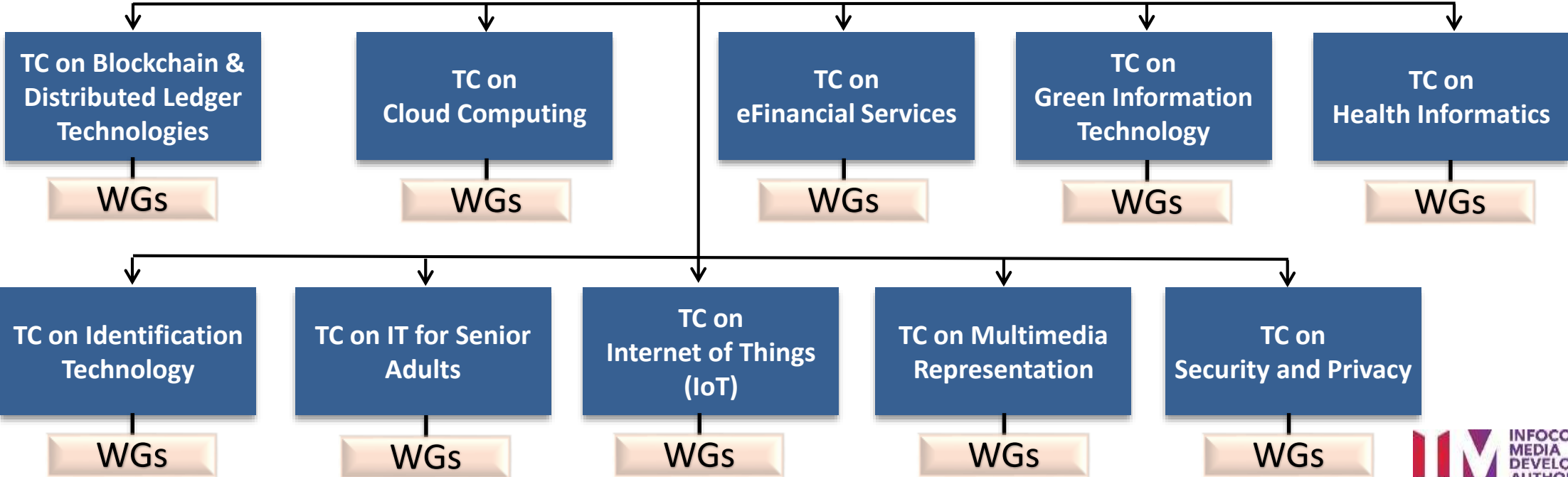
- Network & Service Operators
- Association(s) of Suppliers/Manufacturers
- Government Bodies
- Professional Bodies
- Research Institute(s)
- Academia

# ITSC'S Structure



IT Standards Committee

Secretariat:  
IMDA



- Membership:**
- Government Bodies
  - Professional Bodies
  - Research Institute(s)
  - Academia





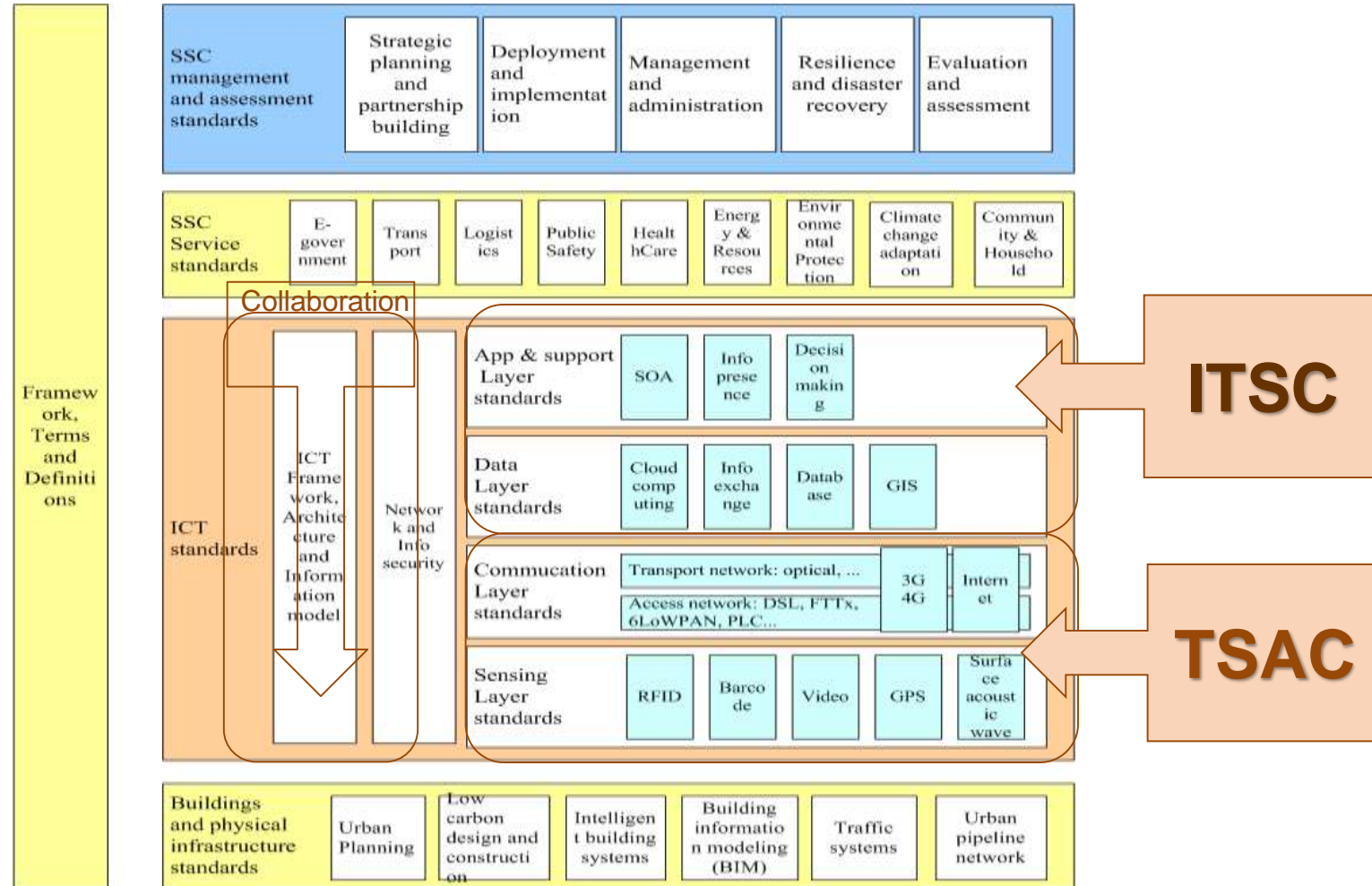
# TSAC & ITSC (Complementary Standards)

- **Telecommunications Standards Advisory Committee (TSAC)**

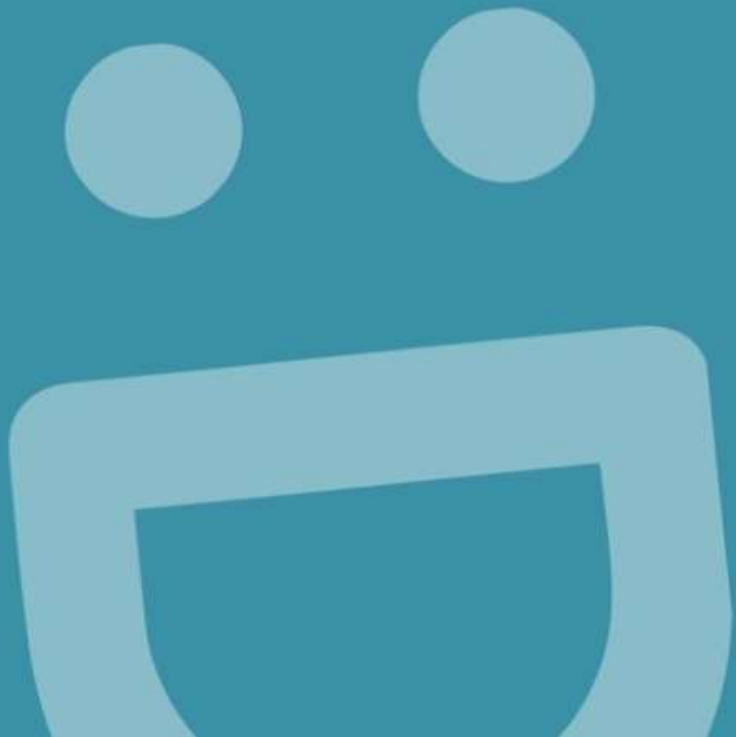
- Focuses on formulating mandatory requirements at sensing & comms layers to ensure multi-vendor and device interoperability

- **IT Standards Committee (ITSC)**

- Focuses on interoperability generally at a high-level, e.g. at the data & applications layers



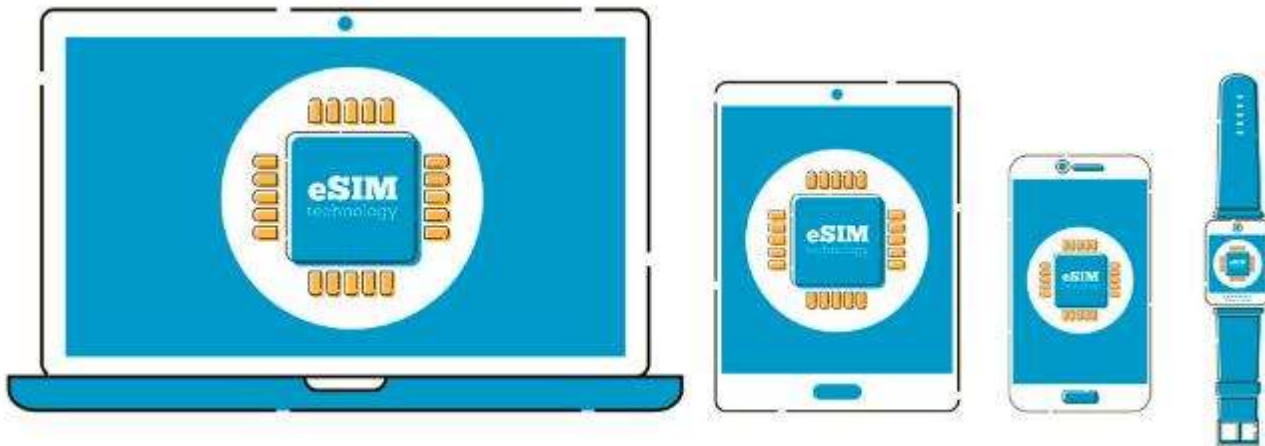
# eSIM



# Evolution of SIM

**SIM:** Subscriber Intity Module, hardware that contains a unique info/keys for your account that allows your service provider to identify you, and grant you access to its network

**eSIM:** EMBEDDED SIM is an updated “form factor” for SIM cards, which affixes the SIM module onto the device



# Conventional SIM vs eSIM

Conventional SIM	eSIM
<p>Personalised for specific Mobile Network Operators (MNOs)</p> <ul style="list-style-type: none"><li>▪ MNOs' specific info, such as the IMSI numbers and authentication algorithms, to be burnt into the SIM card</li><li>▪ Change of network requires the change of SIM card</li></ul>	<p>An extension of today's SIM technology</p> <ul style="list-style-type: none"><li>▪ Allows end users to switch between their MNOs without having to replace the physical SIM card</li><li>• <b>No seamless handover</b> (devices will need to restart in order to connect to another MNO's network)</li></ul>

# Benefits of eSIM OTA Technology

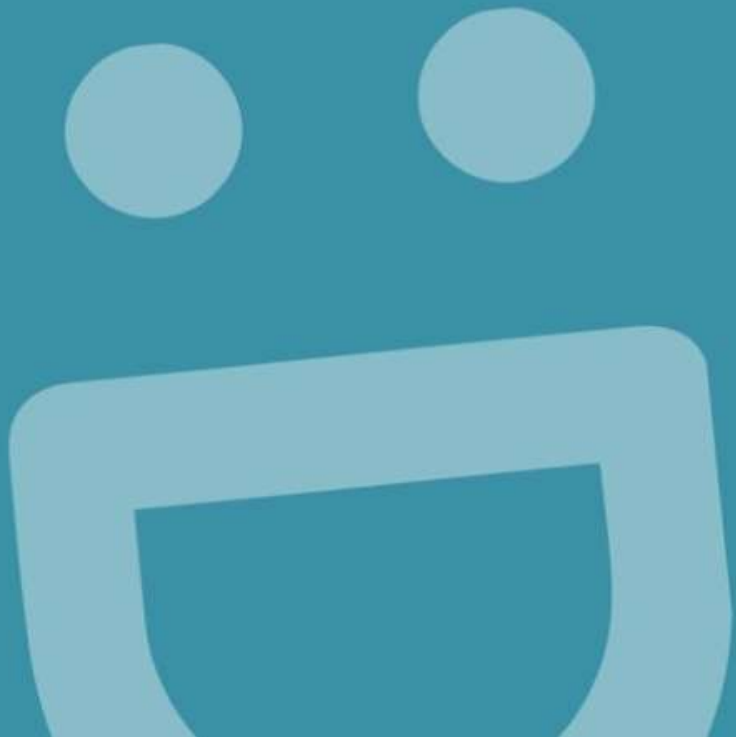
## Facilitate proliferation of IoT devices

- Not locked to specific MNO, especially for M2M devices deployed in inaccessible areas
  - Convenience and cost savings for end users
- Adoption of eSIM-equipped IoT devices will increase

## Promotes innovative service plans for consumers

- Ease of switching between service providers
  - Possible to eliminate roaming charges; switch to local operator's network when overseas
- Smaller consumer products

# How It Works



# GSMA eSIM SM OTA Specifications

The only International specifications for Over-The-Air (OTA) Subscription Management (SM)

**Specifications for M2M devices** was first released in Dec 2013

- OTA capabilities are initiated by service/solution providers and they comprise:
  - Downloading, enabling, disabling, deleting of MNOs' profile
- Bootstrap profile – the native MNO's profile is required for initial connection

**Specifications for Consumer devices** was first released in Feb 2016

- Key differences from the specifications for M2M Devices
  - Switchings are initiated only by consumers
  - Bootstrap profile is not required; initial download of profile may be via WiFi or other connected devices

# GSMA eSIM SM OTA Specifications

Two key roles for the provision of OTA configurations (for M2M)

- ***Subscription Manager Data Preparation (SM-DP)***

- Prepares and stores MNO's profiles which are to be downloaded into the eSIM upon request
- Issue commands to initiate the OTA commands

- ***Subscription Manager Secure Routing (SM-SR)***

- Securely transports both OTA commands and also MNO's profiles to the eSIM

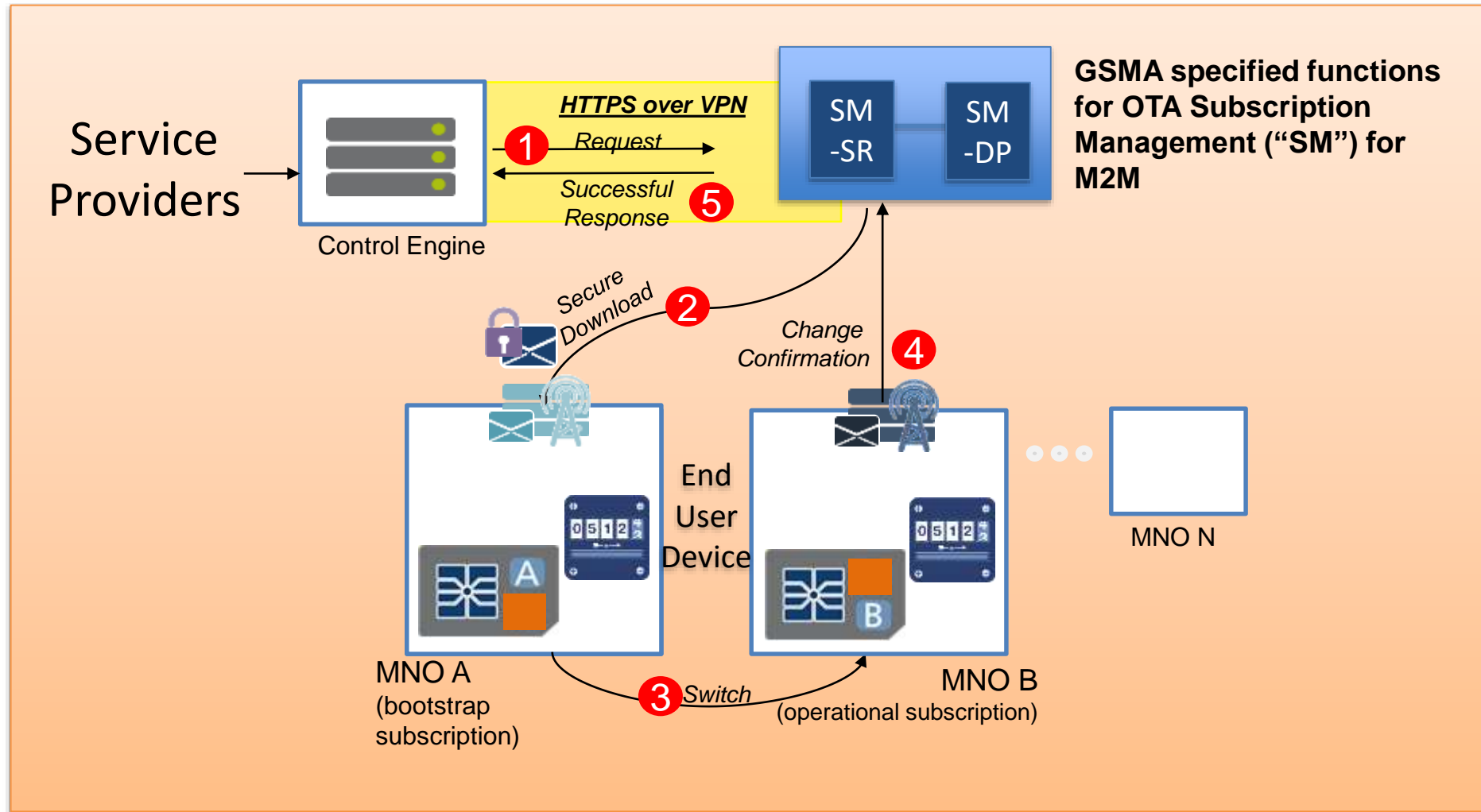
One key role for the provision of OTA configurations (for Consumer)

- ***Subscription Manager Data Preparation plus (SM-DP+)***

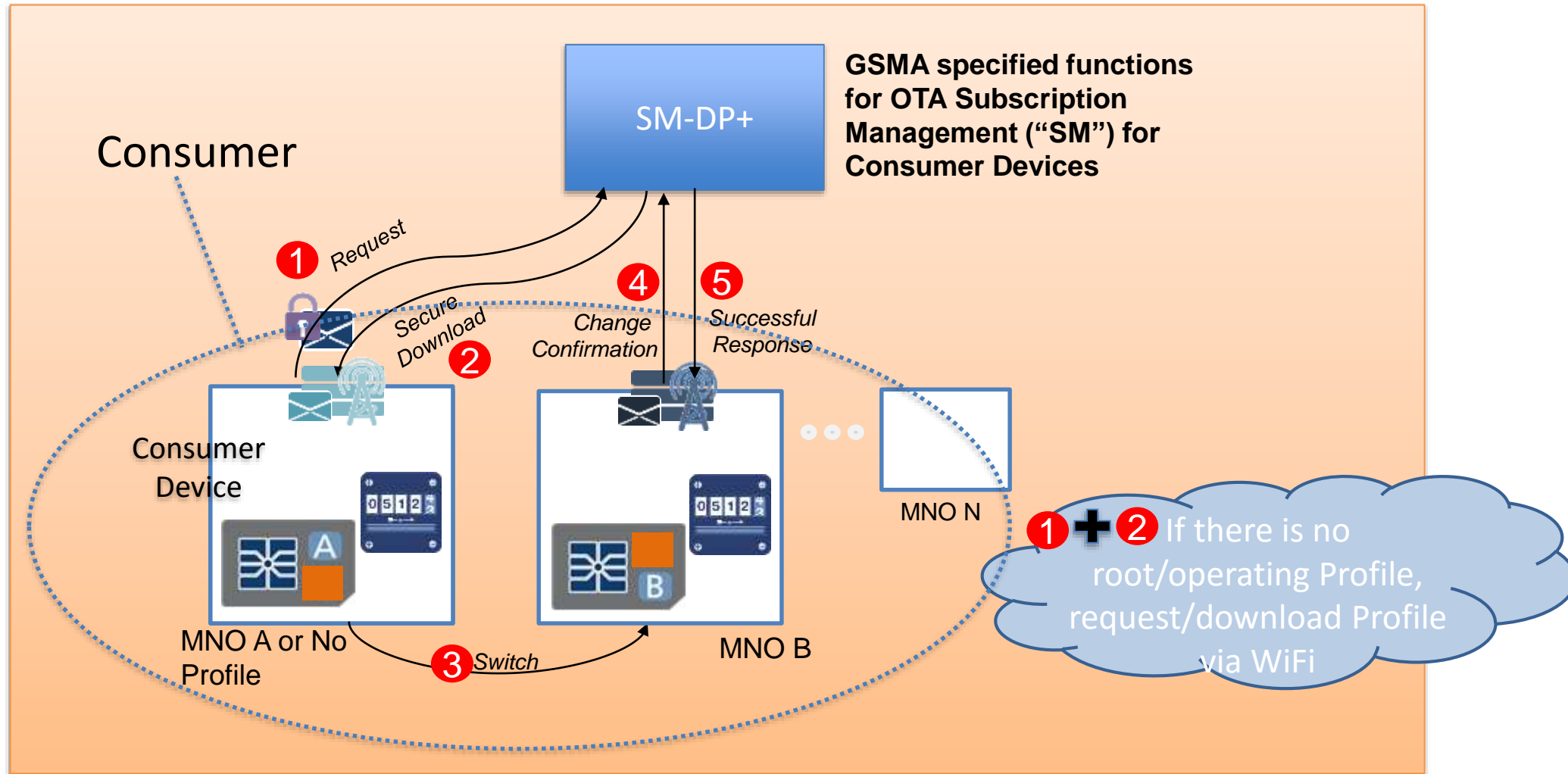
- Prepares and stores MNO's profiles which are to be downloaded into the eSIM upon request
- Securely transports both OTA commands and also MNO's profiles to the eSIM



# Overview of SM OTA (M2M)



# Overview of SM OTA (CONSUMER)



# Standardisation Effort for eSIM Technology



# IMDA's Effort to Facilitate eSIM Deployment

IMDA conducted eSIM trial for M2M devices between 2016-2017

- Trial findings show positive outcome with some possible follow up
  - Possible need of local specifications/reference to ensure interoperability
  - Needs to review the security requirement for eSIM deployment

IMDA carried out a public consult that has closed on 17 August 2018

- Consult on the policy, technical and security aspect of eSIM

IMDA kicked start TSAC Task Force to work on the local eSIM standards, based on GSMA specifications

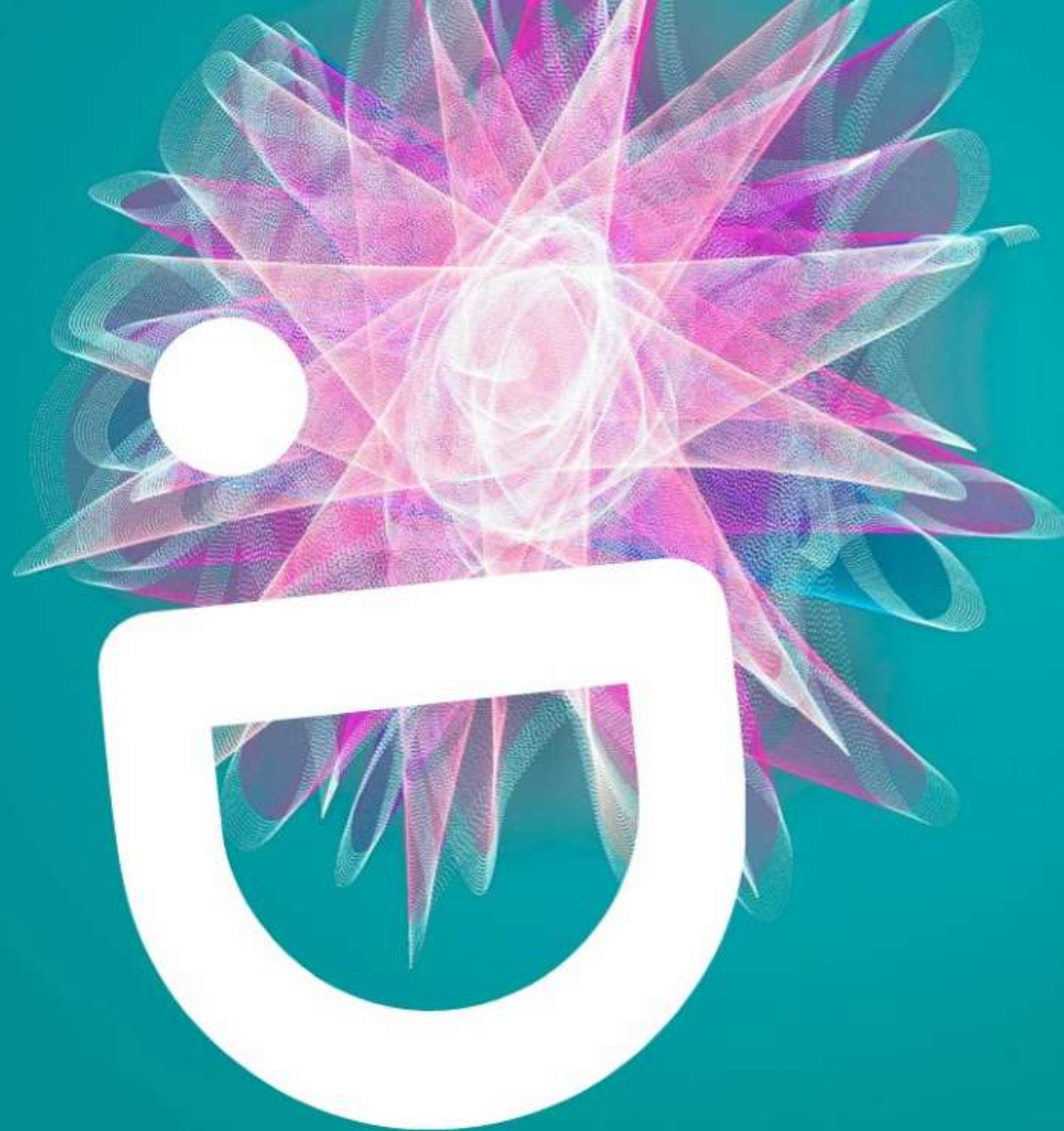
# TSAC eSIM SM Technology TF

IMDA formed a new Task Force (TF) under TSAC to work on the eSIM standards

- 1<sup>st</sup> Kicked Off meeting on 30<sup>th</sup> July 2018
- Representatives from SIM card manufacturers, local MNOs, device manufacturers, etc

eSIM TF aims to develop local technical standards based on GSMA specifications for both M2M and Consumer, focusing on the follow areas:

- Architecture, functions and workflow
- Interoperability
- Security
- Certification



THANK YOU