TRUSTED CONNECTIVITY ALLIANCE

Enabling trust in a connected future

eSIM for IoT:
Industry Insights on the Benefits, Implications and Status of SGP.32 Adoption

eSIM technology is set to transform the IoT

- As IoT deployments accelerate, demand for eSIM technology is growing to cut through complexity and promote simplified global connectivity and advanced security.
- **83% of organisations** identify eSIM as important to the success of future IoT deployments [GSMA Intelligence].
- Counterpoint Research predicts IoT connections on eSIM will reach **2.2 billion by 2030**...

...representing an annual growth rate of **43%**

...but constrained IoT devices present a connectivity challenge

The growth of the IoT ecosystem presents unique considerations due to the increasing number of devices that are constrained in terms of:

Bandwidth (network constrained)

User interface (UI constrained)

Power consumption (power constrained)

Network constrained and UI constrained devices present particular challenges as they cannot be optimally managed using the existing GSMA Consumer and M2M Specifications for Remote SIM Provisioning (RSP).

GSMA has worked with the industry to develop a dedicated eSIM for IoT standard, SGP.32

SGP.32 enables the remote management of constrained devices at massive scale. It introduces two new ecosystem components:

eSIM IoT Remote Manager (eIM) - enables profiles to be downloaded and managed on a single IoT device or fleet of devices without the need for direct end user interaction.

IoT Profile Assistant (IPA) - enables the eSIM to be remotely managed using the eIM platform infrastructure, or to retrieve the profile using the existing SM-DP+ platform infrastructure.

The IPA can either reside on the device (IPAd) or on the eUICC (IPAe).

SGP.32 builds upon proven elements of the existing M2M and Consumer Remote SIM Provisioning Specifications (SGP.02 and SGP.22). It offers a new, dedicated Remote SIM Provisioning model tailored for the unique requirements of IoT devices.

The potential applications of SGP.32 are vast and extend across verticals

While automotive was an early adopter of eSIM, with the introduction of SGP.32, the features and capabilities of eSIM connectivity are set to have a transformative impact across broad verticals and use-cases. For example:

Increased scalability and flexibility – logistic operators deploying asset trackers in shipping containers can seamlessly connect to multiple network providers across jurisdictions, enabling efficient and uninterrupted operations on global routes.

Use of constrained protocols – a utility provider deploying network-constrained smart meters to monitor electricity flows across its offshore windfarms can ensure continuous connectivity over the full lifespan of the device.

Real-time monitoring – seamless and reliable connectivity enables the use of real-time data. In healthcare, for instance, this can help support the timely interventions that improve patient outcomes – alleviating the strain on healthcare practitioners and facilities.

Optimised device production – an IoT device manufacturer deploying products globally does not need to select an operator during production, removing the need for multiple production lines to address different geographies.

As adoption builds, interoperability is an industry priority

GSMA anticipates there will be 6 billion licensed cellular IoT connections by 2030 across all SIM form factors – with eSIM representing a growing share of the market.

- This is expected to be bolstered by the arrival of new enabling technologies such as 5G RedCap and satellite non-terrestrial networks.
- Adoption will also be shaped by broader macro-economic trends, like the global push towards sustainability.

Regardless of the device or use-case, it is crucial that there is a consistent baseline of interoperability across all deployments, to prevent complexity and fragmentation.

The entire secure connectivity ecosystem has engaged in sustained collaboration to address this challenge.

SGP.32 testing and compliance and industry collaboration are key to promoting trust and confidence

SGP.32 is supported by a comprehensive certification and compliance scheme that will ensure eSIM solutions are subjected to thorough assessment and testing to promote security and interoperability.

The eSIM IoT Test Specifications (SGP.33), and product compliance programme for the IoT eUICC are now available. The product compliance programmes for the IPAd are expected in 2025.

This will play a key role in promoting confidence across operators, device manufacturers and service providers.

As deployments increase, industry collaboration is also needed to help drive the iterative enhancements required to ensure robust interoperability.

TCA is committed to shaping the ongoing standardisation and enhancement of eSIM technology. This includes being a key contributor to GSMA to further guide and support the development of its eSIM-related specifications and testing processes.

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About Trusted Connectivity Alliance

Trusted Connectivity Alliance (TCA) is a global industry association working to enable trust in a connected future.

The organisation evolved from the SIMalliance, reflecting the continued expansion of the global SIM industry and the need for broader collaboration. Its members are leading providers of secure connectivity solutions for consumer, IoT and M2M devices. This spans Tamper Resistant Element (TRE) technologies including SIM, eSIM, integrated SIM, embedded Secure Element (eSE) and integrated Secure Element (iSE), as well as hardware and software provisioning and other personalisation services.

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