WHITEPAPER

Empowering OEM eSIM Strategy: Visibility, Testing & Streamlined Deployments

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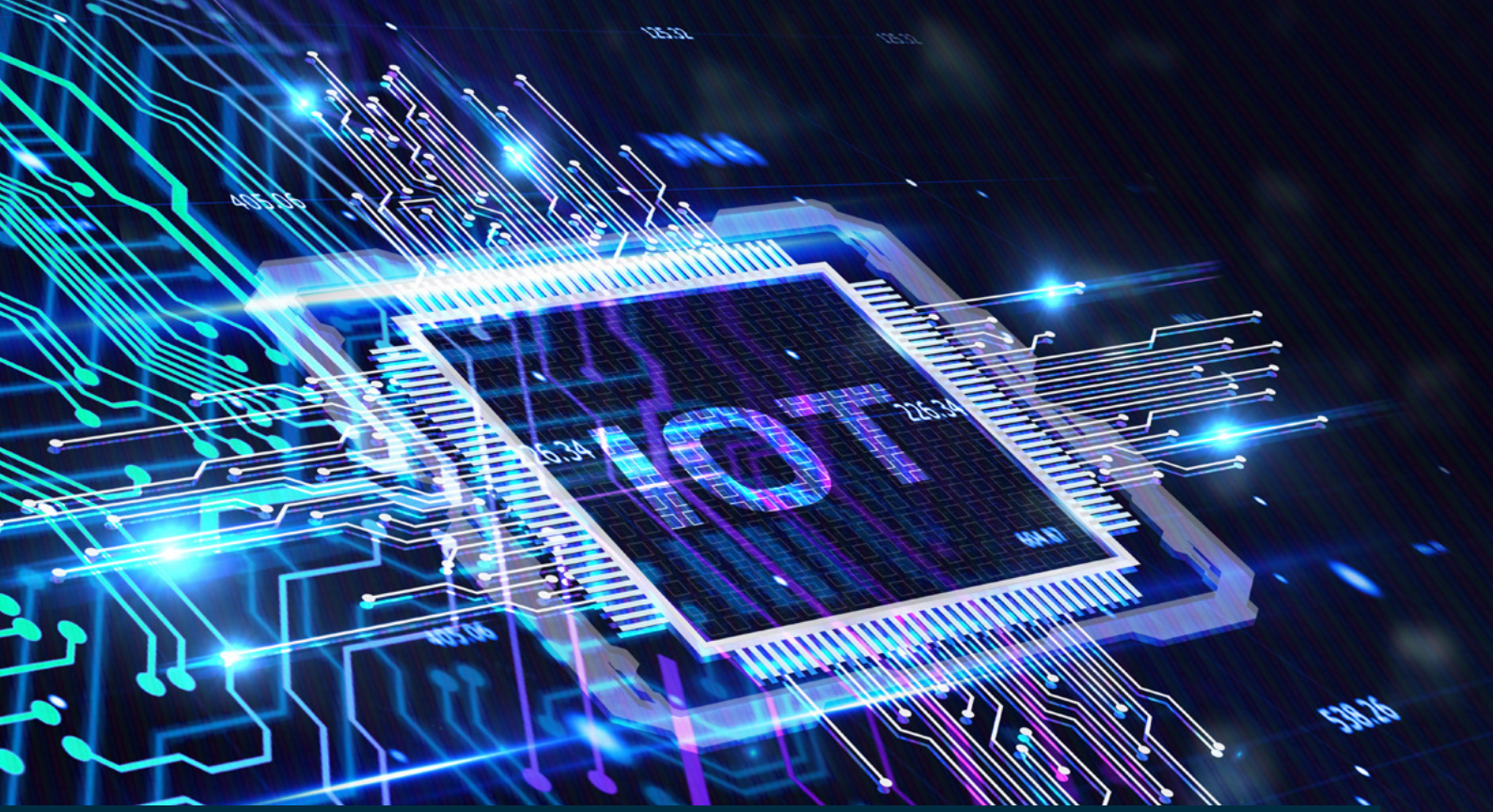
Executive summary

This whitepaper will analyze the growing momentum around embedded SIM (eSIM), which is experiencing significant growth, fueled by device makers incorporating the technology in smartphones and IoT devices. Thales predicts that by 2028 there will be nearly 4 billion consumer eSIM devices and 2 billion eSIM IoT devices deployed globally. In addition, according to GSMA Intelligence data, the number of operators supporting eSIM has more than doubled in the last couple of years, reaching nearly 400 as of June 2023.

This paper will also look at how the introduction of GSMA SGP.32 specifications enhances eSIM technology in the cellular IoT market, streamlines SKU management, simplifies network profile management such as profile downloading and switching, and improves device management for enterprises. By addressing these barriers, the adoption and awareness of eSIM technology will grow dramatically.

In addition, this whitepaper will explore the challenges that device makers encounter in gaining visibility into the usage of their devices and look at the importance of implementing a robust testing approach throughout the device lifecycle. Furthermore, this whitepaper will delve into the specific pain points faced by the IoT industry and will highlight how Thales effectively addresses these pain points.



Rapid Rise of eSIM: Transforming Connectivity for Consumer and IoT OEMs

The embedded SIM (eSIM) is growing steadily thanks in part to the increasing number of device makers that are incorporating the technology into their smartphones and Internet of Things (IoT) devices.

Thales predicts that by 2028 there will be almost 4 billion consumer eSIM devices and 2 billion eSIM IoT devices deployed worldwide. According to GSMA Intelligence, as of June 2023, nearly 400 operators supported eSIM-enabled devices. Notably, eSIM-only smartphones are gaining popularity, with Apple leading the trend by introducing eSIM-only models like the iPhone 14 and iPhone 15 in the U.S. market.

The latest figures from the Trusted Connectivity Alliance (TCA) for 2023 show a 109% increase in eSIM consumer profile downloads. Additionally, there was a 12% rise in the deployment of Subscription Manager platforms in the automotive and IoT industries. This demonstrates a strong foundation for eSIM adoption for those verticals.

These numbers underscore the transformative potential of eSIM across various sectors. The introduction of GSMA SGP.32 specifications has further advanced eSIM technology in the cellular IoT market, simplifying network profile switching and improving device management for enterprises. GSMA Intelligence forecasts the number of licensed cellular IoT connections will reach 5.8 billion globally by 2030, up from 3.5 billion in 2023. eSIM will take a growing share of the market. An operator survey conducted by GSMA Intelligence shows that operators expect eSIM to account for nearly 40% of the total number of cellular IoT connections by 2030. For the smartphone market, GSMA Intelligence estimates that by 2028 half of all smartphone connections globally will use eSIM technology.

There is a noticeable increase in consumer awareness and adoption of eSIM technology. According to a recent GSMA Intelligence consumer survey across major developed mobile markets, consumer awareness of eSIM has risen from 20% in 2020 to more than 40% in December 2023. Although these figures indicate that there is still work to be done, the upward trend suggests that more people are becoming familiar with eSIMs. It is important to continue educating consumers and addressing any barriers to adoption to further increase the awareness and uptake of eSIM technology.

Unlocking visibility for OEMs

Though eSIM awareness among consumers is on the rise, there is still a rather large information gap for smartphone, laptop/tablet and IoT OEMs/ODMs. In a 2023 GSMA Survey Report "Measuring the Importance of the eSIM in the Mobile Market," which is based on responses from an online survey of 673 participants that included smartphone, laptop/tablet and IoT OEMs/ODMs, it was found that all three groups of participants expect to launch eSIM-enabled devices within 12 months, but many are concerned about the lack of visibility of eSIMs in the marketplace. This lack of visibility makes it difficult for OEMs to fine-tune their products and understand the eSIM ecosystem.

To provide OEMs with market insights and foster a deeper understanding of eSIM adoption, Thales has compiled a range of innovative use cases from mobile network operators worldwide. These real-world examples showcase the diverse possibilities offered by eSIM technology, offering OEMs increased visibility and inspiration for their own product strategies.

- eSIM-first Strategy. This approach prioritizes the adoption of eSIMs by encouraging consumers and enterprises to embrace eSIM-enabled devices and purchase eSIM plans. With the eSIM-first strategy, enterprises can more easily manage the connectivity of their workforce around the globe. Plus, eSIM-enabled devices allow for seamless travel connectivity and eSIM-enabled wearables offer an enhanced user experience and more flexibility.
- eSIM Trial. Some mobile operators are using eSIM technology to offer non-customers a free trial of their service without having to switch operators. This allows users to experience the network quality and services before committing to a full subscription.
- eSIM for Travel. Some mobile operators have introduced eSIMs specifically designed for travel. Customers can purchase eSIMs in participating countries, instantly receive the eSIM QR code via email, and activate the eSIM to enjoy local connectivity without the need for physical SIM cards. This provides convenience to travelers and keeps the customer connected while on the go.
- eSIM for Wearables. Many mobile service providers support eSIM technology for wearable devices such as smartwatches. This enables users to directly connect their wearables to cellular networks without the need for a separate physical SIM card. By integrating eSIMs into wearables, users can enjoy a seamless and independent connectivity experience. In addition, they are able to receive notifications, make calls, and track fitness activities without relying on a paired smartphone.
- eSIM for Corporate Connectivity. Businesses can leverage eSIM technology to simplify connectivity management for their employees. By centrally managing personalized subscriptions for employees using eSIMs, companies can streamline the process of providing connectivity to their workforce. This allows companies to manage and allocate network resources efficiently.
- eSIM for Fixed Wireless Access (FWA). eSIM FWA routers enable Mobile Network Operators (MNOs) to leverage their 5G investments, delivering enhanced internet connectivity for both domestic and corporate users, compared to traditional wired broadband routers. Consumers benefit from the portability, easy setup, and scalability to accommodate multiple devices. For corporations, these routers provide reliable remote connectivity, enable mobility for employees, and offer quick deployment without extensive wiring.
- eSIM Transfer. Thales helps to ensure seamless device change. Known as eSIM transfer, this feature allows users to effortlessly transfer their eSIM subscription from one device to another. This challenge becomes even more significant as eSIM transactions continue to grow and eSIM-only smartphones gain prominence beyond the borders of the U.S. Thales recognizes the unique requirements of different device change scenarios and offers tailored technical solutions to meet them.

Embracing Robust Testing Processes

eSIM device testing is critical in all phases of the process —from the design of the module to the form factor selection. This is also a critical component to make sure the eSIM meets various technical specifications and during eSIM integration.

In the 2023 GSMA survey on the eSIM market, 43% of smartphone OEMs laptop/table OEMs and IoT device OEMs/ODMs, said that lack of support for eSIM device testing was their biggest concern when it comes to implementing eSIMs in devices.

Thales provides comprehensive testing services throughout the development process and supports OEMs in their product deployments from early design stages until production and commercial launch. Additionally, Thales is available for customized support to integrate and build eSIM-capable devices.

- Presales Support and Design Stage. Thales offers invaluable guidance to customers by assisting with technical needs and questions, presenting eSIM solutions and technology features, and reviewing use cases for technical feasibility. Thales collaborates closely on device design, providing implementation guidelines and integration datasheets. The company also ensures effective management of eSIM profiles by the device through the selection or development of suitable solutions.
- Integration and Testing Phase. Thales supports customers during integration and testing, providing them with sample code and software modules for efficient eSIM profile management and updates. Thales offers access to its Thales SM-DP+ platform for real-time testing and facilitating technical exchanges with MNOs for seamless integration.
- Industrialization Process Assistance. Recognizing the importance of rigorous testing in the production line, Thales assists manufacturers in defining suitable tests and supports their development and deployment. This ensures high-quality standards are consistently met during the industrialization process.
- Field Deployment and eSIM Lifecycle Support. Thales extends support beyond production with a focus on field deployment and the complete eSIM lifecycle. Thales conducts thorough analysis to resolve any field issues and assist with the preparation and deployment of eSIM updates to address issues or introduce new minor features promptly.

By offering comprehensive testing services at each stage, Thales ensures that OEMs have the necessary support to successfully deploy their products.

Revolutionizing IoT Deployments with Game-Changing eSIM Technology

A new frontier for eSIMs and integrated SIMs (iSIM, a smaller from factor of eSIM) promises to revolutionize IoT. In the 2023 GSMA survey, more than half of IoT OEMs said that less than 5% of their current portfolio of IoT devices includes eSIM-enabled products but they expect that to grow substantially in the next three years, when they expect 56% of their portfolio will be eSIM enabled.

According to GSMA Intelligence, 40% of enterprises see eSIM as being very important to a successful IoT deployment. Plus, an August 2023 survey conducted by Omdia that queried 506 enterprises across nine countries found that 75% said they are adopting or plan to adopt eSIM technologies.

There is growing awareness of the benefits of the eSIM, and its ability to address key challenges and priorities of IoT enterprises. Notably, these advantages include efficient use of space, resistance to tampering, and support for highly efficient, remote activation and management of subscriptions for large numbers of deployed IoT devices. Moreover, the ability to use a single eSIM SKU (Stock Keeping Unit) across all markets and regions, and download an appropriate subscription locally, post-deployment, offers OEMs the potential to realize significant efficiencies in their manufacturing and logistics operations.

Also, Enterprises are particularly interested in the eSIM's ability to seamlessly handle scalable security and remote updates across a large volume of devices.

However, IoT OEMs face a number of challenges, particularly when manufacturing devices for different countries because of the complexity involved in managing multiple stock-keeping units (SKUs) that are specifically built for multiple MNOs. In this regard, eSIM technology can drastically simplify the manufacturing process by eliminating the need to produce and manage different variants for each device and network provider, resulting in complex SKU management.

In addition, constraints on power and computing have limited enterprises from taking full advantage of eSIM.

One recent development that helps streamline this process is the GSMA's new SPG.32 specifications that are intended to reduce the complexity around downloading and switching network profiles, making it easier for companies to manage devices and achieve the best connectivity on the field.

GSMA Intelligence expects eSIM technology to play a key role in driving future IoT developments. The research firm forecasts the number of licensed cellular IoTconnections (including cellular machine-to-machine and licensed low-power wide area) to reach 5.8 billion globally by 2030, up from 3.5 billion in 2023, with eSIM taking a growing share of the market.

Thales goes beyond the standards by offering self-contained solutions that have no impact on device design and manufacturing, providing OEMs with seamless integration capabilities.

Thales supports OEMs through three pillars: Build, Run, and Protect. Under Build, Thales provides industry-grade hardware solutions (eSIM / iSIM) for secure and flexible connectivity. Under Run, Thales offers a connectivity suite for secure and cost-effective connectivity during device production and operations. Under Protect, Thales offers a comprehensive cyber protection suite that safeguards IoT device identity and data throughout the device lifecycle, ensuring security from production to long-term operations.

Thales: Your Trusted Partner for eSIM Solutions

With a complete portfolio of GSMA-certified eSIM products, Thales brings extensive expertise in eSIM technology. Our strong relationships with over 100 OEMs in the IoT and consumer markets ensure high-security solutions and global support. We innovate in embedded products, including the revolutionary iSIM and the world's first Connected Secure Element certification. With a global footprint of consultants and engineers, we provide reliable support and successful deployments worldwide. Choose Thales as your trusted partner for expertise, innovation, security, and global support in eSIM solutions.

Thales (Euronext Paris: HO) is a global leader in advanced technologies within three domains: Defence & Security, Aeronautics & Space, and Digital Identity & Security. It develops products and solutions that help make the world safer, greener and more inclusive.

The Group invests close to €4 billion a year in Research & Development, particularly in key areas such as quantum technologies, Edge computing, 6G and cybersecurity.

Thales has 81,000* employees in 68 countries. In 2023, the Group generated sales of €18.4 billion.

* These figures exclude the ground transportation business, which is being divested

Useful links:

Empowering OEMs and ODMs in the Consumer Market

Thales eSIM Solutions for IoT OEMs

Thales eSIM Solutions

Thales for IoT: enabling cyber secure IoT connectivity

Measuring the importance of eSIM in the mobile market, 2023 GSMA survey

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