7 Top eSIM use cases



White Paper

Moving device designs from a plastic SIM card to an embedded SIM (eSIM) chip may seem like a small change.

In practice, much more than the form factor itself changes. Switching to remotely provisioned eSIMs brings new features aimed at improved scalability for Internet of Things (IoT) applications.

Streamlined, secure provisioning of eSIMbased devices brings many eSIM use cases where scalability drives faster and broader IoT adoption. We highlight the top seven in this whitepaper.

Introduction

Let's briefly explore how eSIM technology solves several key issues.

SIM card technology is network operator-dependent, creating an enormous bottleneck in deploying any device globally. SIM cards must be physically programmed and handled, increasing logistical and manufacturing complexities.

This physical handling aspect makes it cost prohibitive to manage large IoT deployments, especially if they're located remotely. Traditional SIM cards can also be accessed and removed, opening the door for theft or disruption of service.

eSIM is a GSMA specification that enables remote SIM provisioning (RSP) of any cellularly connected device. It provides a simple and secure method for downloading a profile (or several profiles) over-the-air from a mobile network operator (MNO).

When a device owner changes to a different service provider, RSP makes a remote and seamless SIM profile change possible.

For IoT application providers, RSP enables provisioning of large numbers of devices with connectivity, anywhere within network coverage, quickly and across as many network operators as needed.



Innovative eSIM use cases

With the rapid growth of IoT applications, eSIM technology is well placed to enable scalable, secure global connectivity. Here is just some of the innovations underway enabled by eSIM technology.

Automotive

For automakers, delivering cars to any country without inserting a specific SIM reduces costs and improves reliability and customer service. Rather than outsourcing connectivity to a specific network operator, automakers can handle eSIMs in their vehicles as a managed service.

Emergency call systems and connected cars are the main drivers for eSIMs in the automotive sector. eCall has been mandatory in Europe since April 1, 2018, and ERA-GLONASS in Russia and OnStar in North America are also in place. All three systems make the case for multiple operating profiles stored in an eSIM, one dedicated to supporting the specific emergency call system, and others supporting the owner's cellular services of choice.

eSIM enhances the value in connected cars. According to the latest statistics from ABI Research, there are an estimated 395.91 million connected cars (global connected car subscriptions) on the road this year (2020). This volume is forecast for steady growth over the next 5 years, reaching an estimated 729.47 million by 2025. Changing network providers, by choice or by necessity of moving to another country, will be routine with eSIM managing over-the-air (OTA) profile updates.

Buying or selling a car with eSIM will be worry-free, with a simple OTA download establishing services for the new owner. With emerging cellular vehicle-to everything (C2VX) applications, many more subscription-based content services are expected. eSIM will help owners choose the C2VX subscription services they want quickly and easily.





2022	524.63
2023	592.34
2024	660.71
2025	729.47

Connected car market data estimates (# in millions) Source: ABI Research



Shipping and logistics

Knowing the exact location of goods in real-time during shipment is essential. Cellular M2M modules are very attractive in logistics, especially for use on high-value, highly mobile assets.

For example, FedEx is offering SenseAware, a multi-sensor device and webbased application providing vital shipment data. Using eSIM technology with cellular M2M modules opens more innovation possibilities.

With eSIM technology, tracked assets can be shipped anywhere and provisioned on any network across the world. There is no longer a need to physically swap SIM cards before and during transit or expensive roaming contracts. Service providers can change network profiles as needed from their management console using remote SIM provisioning (RSP).

This greatly simplifies logistics, lowers tracking costs and puts more control in the hands of the application owner. Also, new lower-power cellular M2M modules mean fewer required battery changes in the field.





Object tracking and site monitoring

Within a facility or campus, electronic item tracking is also valuable. Real-time location systems (RTLS) have relied primarily on RFID or Wi-Fi technology.

These require dedicated reader or access point infrastructure nearby for an item to be tracked. As for other technologies, GPS item tracking doesn't work well in many indoor settings, and Bluetooth has limited range.

eSIM enables use of low power wide area (LPWA) networks for object tracking and site monitoring – especially in the case where an operator has multiple facilities in different geographic regions. One type of eSIM-enabled device can be used everywhere, managed via RSP which can change profiles if an item moves to another location on a different network. eSIM greatly reduces the potential for tracking interruption due to physical SIM tampering.





Smart energy

A big driver in connectivity for smart energy applications is security. Many of these applications have chosen a mesh network such as ZigBee running on a manufacturer specific profile (MSP), or other proprietary solution.

This approach ensures only devices with utility-specific hardware and software can deploy on their network. It's a highly secure but costly approach with dedicated infrastructure, typically customized for the utility.

With eSIM technology, a utility deploys a smart energy device anywhere within LPWA coverage and registers it securely into their application.

By using established ubiquitous cellular networks, utilities benefit from a broader device supply chain choice as more off-theshelf smart energy devices with LPWA connectivity and eSIM technology become available.





Wearables

Battery life and small device size are everything in personal wearables. For wearables monitoring health conditions or incorporating power-hungry audio and vision, longer battery life between recharges is essential.

By eliminating the physical SIM card, eSIM helps designers create much smaller devices or free space for larger batteries and more sensors.

For example, LPWA connectivity and eSIM technology transform mHealth devices. **A healthcare provider can provision its monitoring devices from a central location using RSP, then prescribe them for patients locally.**

Whether the patient is in a healthcare facility or at home, the device is managed the same way. Devices such as glucose monitors, EKG monitors, fall detectors, AR glasses, and others can be made more secure and use less power.



Agriculture

The sheer geographic scale of modern farming operations limits deployment of many wireless connectivity options.

Corporate farming is often acquiring multiple farms spread across states and countries, creating a need for centralized network management. In addition to tracking equipment anywhere, tracking can also be used for livestock and people, so smaller, less expensive tracking devices are needed.

eSIM technology enables management of profiles across networks easily with RSP. **By choosing eSIM-enabled devices, operators can choose their network provider and the wireless technologies – indoor or outdoor, rugged or flat terrain, whatever is best suited for their need.**

eSIM reduces tampering, battery changes, and service calls for devices that may be extremely remote and difficult to access.



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Home security

Sensors are making inroads at smart homes everywhere. Bluetooth, ZigBee, Z-Wave and other protocols are appropriate for most sensor devices in a home.

For enhanced security, a home security hub should have an independent cellular-based connection to a monitoring service. If external cables to the home are cut, the home security hub still has its wireless connection.

Again, with eSIM technology inside, a single home security hub configuration can be delivered into any network provider coverage and provisioned remotely by the monitoring service.

If the homeowner moves, or opts to change monitoring services, the hub is easily re-provisioned in another network. The service provider has control over the subscription and is freed from tampering concerns as part of maintaining service levels.



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Extending service offerings

One of the biggest eSIM opportunities goes beyond network connectivity. The ability for eSIMs to download and store multiple profiles also applies for application credentials.



Instead of repeatedly using the old, insecure email and password combination, or having to manage certificates and expirations on a device, application providers can authenticate a user's device once and provide it a secure eSIM profile.

This streamlined application access is crucial for IoT devices, but also increases user satisfaction with applications on mobile devices.

For application providers, another benefit exists: should the user subscription lapse, their device can be rapidly and positively de authenticated via RSP. If the user returns, restoring service is equally as easy.

eSIM also represents a potential breakthrough for managing bring your own device (BYOD) environments. A hodge-podge of cloud application authentication schemes could be consolidated securely into one secure eSIM profile orchestrated to authorized applications.

As more providers move to the everything as a service (XaaS) model, eSIM provides a secure element needed for effective application and network management.

Buying or selling a car with eSIM will be worry-free, with a simple OTA download establishing services for the new owner. With emerging cellular vehicle-to-everything (C2VX) applications, many more subscription-based content services are expected.

eSIM will help owners choose the C2VX subscription services they want quickly and easily.





Proven, compliant eSIM solutions

Capturing all these opportunities is easier when starting with proven SIM solutions from Kigen. Our secure, GSMA-compliant eUICC SIM OS stack is optimized for compactness and portability to multiple hardware form factors, whether it is eSIM or iSIM.

eSIM technology helps OEMs benefit from cost effective global IoT connectivity. **Going even further, iSIM enables IoT devices that are even more cost-effective, lower in power and last longer in the field.**

Cellular devices drive scale into massive IoT

The future for eSIM and iSIM technologies is bright. Innovation with eSIM and iSIM from chipset makers, device makers, MNOs, and application providers should lead to more secure, interoperable IoT applications.

For more on Kigen SIM solutions, visit:

k <u>www.kigen.com</u>



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