

Analyst report

# The strategic role of connectivity in POS deployments

May 2026



### Eliminating downtime with multi-network connectivity

The point of sale (POS) industry is undergoing a significant transformation driven by the increasing reliance on non-cash payments and the opportunities they present. As the payments landscape evolves, POS providers face mounting pressure to ensure uninterrupted services, product reliability and customer satisfaction. Adopting a multi-network connectivity approach has become a critical strategy to address these challenges, as it offers a robust solution to the prevalent issues associated with a traditional cellular single-network or non-cellular-based approach. This analyst report explores the imperative for POS providers to embrace multi-network IoT connectivity. This approach will be examined for its potential to not only mitigate connectivity issues but also facilitate seamless market expansion, reduce operational complexities, and unlock new revenue opportunities.

### Why connectivity is key for operating POS terminals

The world is continuously shifting from coin and paper-based payments such as cash and cheques to electronic forms such as payment cards and mobile payments. The number of general-purpose payment cards in circulation worldwide, including credit, debit, and prepaid cards, surpassed 27 billion cards in 2025, led by Visa, MasterCard and American Express that together manage 7.5 billion payment cards, and UnionPay that has an installed base of more than 10 billion cards.

Today, payment cards can be used to withdraw cash at close to 3.1 million ATMs or to conduct transactions at 344 million POS terminals and 126 million mPOS terminals worldwide. A successful payment is dependent on the availability of secure data communications to contact the acquiring bank with a request for a transaction. For this purpose, wireless communications is a very suitable option.

Reliable connectivity is paramount for smooth POS operations as payment terminals must always be online to accept payments. Connection failures carry significant consequences, with the most immediate impact being lost sales. Beyond the financial toll, network downtime can also lead to damaged customer relationships and lost productivity. Although POS providers and merchants increasingly reevaluate their existing network setups, they still mainly rely on Wi-Fi, fixed and cellular single-network connectivity to support their operations. Overall, the adoption of cellular solutions is growing, as retailers embrace cellular failover routers and cellular POS solutions for enhanced reliability and flexibility.

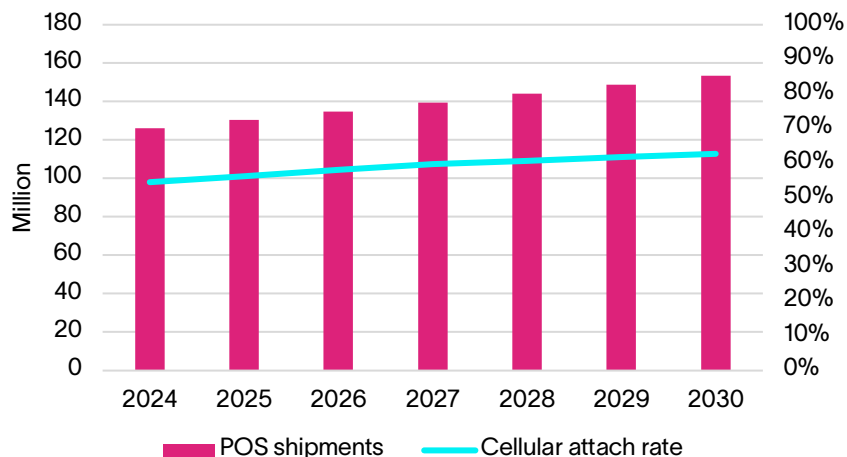
Using cellular multi-network connectivity for POS terminals offers several advantages including:

- › Mobility and flexibility – Can operate anywhere within cellular coverage.
- › Quick setup – Works out of the box with a SIM or eSIM.
- › Reliable backup connection – Can also act as a failover connection, which minimizes downtime and lost sales.
- › Broad geographic coverage – Consistent performance even in areas without Wi-Fi.
- › Enhanced security – More secure than other connectivity options.
- › Scalability – No need to expand local network infrastructure.
- › Better customer experience – More reliable connection means quicker transaction approvals and fewer failed payments.

### Steady uptake of cellular IoT connectivity

The POS market is poised for significant growth, driven by advancements in connectivity technology. POS terminals today use a variety of different communications technologies. Mobile terminals generally rely on short-range wireless connectivity technologies such as Bluetooth and Wi-Fi, or wide area networks such as 2G/3G/4G/5G. Stationary terminals, meanwhile, often rely on fixed networks such as DSL, PSTN, TCP/IP or X.25, although wireless connectivity is also common for stationary terminals.

Figure 1: POS terminal shipments (World 2024–2030)



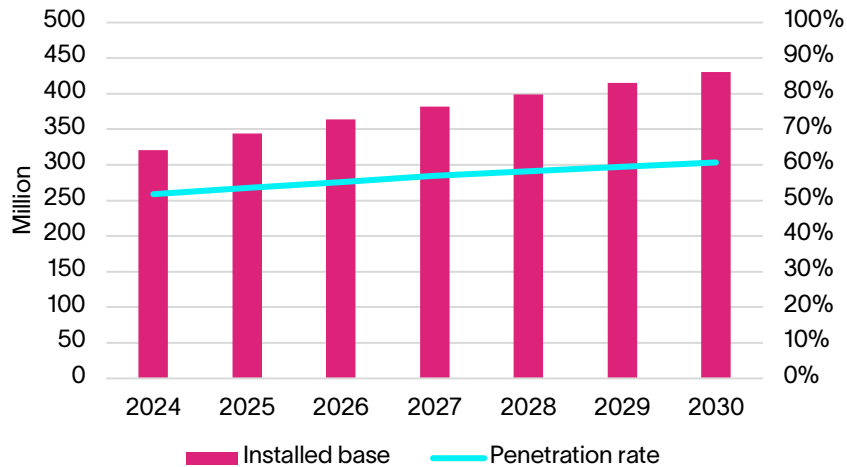
The introduction of cellular connectivity has allowed many new groups of users to adopt POS terminals and accept electronic payments. Typical examples are home delivery services, taxi and limousine services, outdoor restaurants, and various services provided by professionals such as electricians and repairmen. Overall, the

convenience and flexibility of not needing a fixed-line connection have made cellular connectivity a highly popular option. Furthermore, cellular connectivity is facilitating the adoption of electronic payments in emerging markets where the fixed-line telecommunications infrastructure is less developed. Due to the relatively low cost of wireless IoT modules and connectivity services, cellular POS terminals have also become a viable alternative in the stationary terminal segment. In this segment, the main benefit is that a fixed line does not need to be installed. Cellular connectivity has become a very popular option for POS terminals and was incorporated in approximately 73.3 million of the 130.4 million POS terminals that shipped in 2025. In total, an estimated 184.0 million of the 344.0 million POS terminals that were in use worldwide at the end of 2025 included cellular connectivity. This corresponds to a penetration rate of 53 percent.

By 2030, it is expected that 63 percent of all POS terminals shipped will feature cellular connectivity. Multi-network solutions are projected to see a particular rise in demand as merchants and POS providers seek more reliable and versatile connectivity options. Multi-network IoT connectivity is particularly attractive because it offers easy switching between different network providers, ensuring consistent performance even in areas with patchy network coverage.

As multi-network POS solutions become more widely used, merchants will experience fewer connectivity-related disruptions, leading to more stable and efficient operations. This improvement in reliability and performance is expected to drive higher Gross Payment Value and improve the overall customer experience. Another potential game changer in the market for POS terminals is related to marketplaces and new types of apps that can be installed on POS terminals.

**Figure 2: POS terminal installed base (World 2024–2030)**



Traditionally, POS terminals have been relatively closed, with only a limited number of payment applications allowed to run on the device. The application environment on POS terminals has, however, started to open up, allowing merchants to download and install business-specific apps on their terminals. This can enable merchants to accept coupons or vouchers in new ways, conduct their business more efficiently and improve the customer experience.

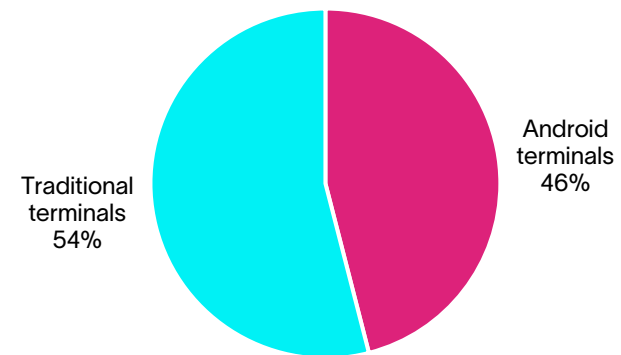
A direct consequence is that merchants will start to consider the platform’s strength when they choose POS terminals. The POS terminal vendor with the broadest application base is likely to stand at an advantage vis-à-vis smaller competitors that have more limited platform support.

**Android payment terminals gain traction**

The Android ecosystem unlocks the ability to move beyond proprietary ecosystems and allows acquirers and value-added providers to develop their own applications. There are few limits to the types of applications that can be deployed on Android devices.

The Android OS makes it easy to complement payments with business applications. The OS comes with a large developer community, and a plethora of application types can be deployed on an Android-based POS. These might include front-office apps, such as loyalty, click and collect and ticketing, while back-office apps can deliver for instance reporting and staff management. The platform also makes it possible to accept alternative payment methods, leveraging extended device capabilities, such as cameras, scanning and NFC. Android unlocks the ability to easily port new applications, including QR codes and digital wallets – on top of traditional payment methods.

**Figure 3: POS terminal shipments by form factor (World 2024)**



Examples of major vendors that offer Android POS terminals include Ingenico, Verifone, Landi, MoreFun, Sunmi, Newland Payment Technology, Nexgo, PAX Technology, Tianyu and Vanstone Electronic. Android POS terminals were in 2024 most popular in Europe and North America, where more than two-thirds of the total POS terminals sold were Android POS terminals. POS terminals also consisted of more than 50 percent of shipments in the Middle East & Africa. In 2024, more than 45 percent of the POS terminals sold worldwide were Android POS terminals. The regional split for these were Europe (19 percent), North America (13 percent), Latin America (22 percent), Asia-Pacific (33 percent) and Middle East & Africa (14 percent).

### How connectivity failures impact POS and merchant operations

Payment terminals need reliable, always-on connectivity to support uninterrupted payment acceptance. Connection failures carry significant consequences, with the most immediate impact being lost sales. Beyond the financial toll, network downtime can also lead to damaged customer relationships and lost productivity. For merchants, this is not only a sales issue but also an operational one, as staff are forced to spend time managing incidents rather than serving customers.

The wider impact of connectivity failures often extends beyond the duration of the outage itself. Repeated disruptions can erode confidence in the merchant and in the POS provider, particularly if payment problems become recurring. Connectivity issues may arise in overloaded Wi-Fi environments, during fixed broadband outages, or when cellular solutions rely on a single mobile network without effective failover.

The dependency on Wi-Fi leaves merchants exposed to the risks of connection failures, particularly in high-traffic environments such as shopping malls, sports

events and festivals. When thousands of devices compete for bandwidth, Wi-Fi networks can become congested, leading to intermittent connectivity or complete outages. Disruptions may also occur due to fixed network connection issues caused by construction mishaps, weather events or other failures in network operations.

Cellular connectivity solutions relying on a single network can also result in inconsistent service. For instance, at a festival where 100,000 customers share the same network as the POS devices, the quality of service can become severely impacted and lead to lower speeds, dropped connections and higher latency. With the option of just one network rather than the failover that a multi-network offers, POS performance could suffer or even fail completely. Additionally, a network that performs well in one location may struggle in another, leaving merchants with slow or unreliable POS functionality across their footprints.





### Technology innovations shaping the future of POS operations

Innovations in POS operations are transforming the retail landscape, driven by advances in technology and changing consumer expectations. Cloud-based POS systems are leading the charge, offering real-time data access, enhanced security, and seamless integration with various business applications. Mobile POS solutions are also gaining traction, enabling sales transactions to be conducted anywhere within a store or in remote locations, improving customer service and operational flexibility.

There are also innovations taking place in the POS terminal form factors. A software point of sale (SoftPOS) is a type of software-based payment system that enables merchants to accept debit and credit card payments using a tablet or smartphone. The technology is often marketed as “Tap to Phone” or “Tap on Phone”. The SoftPOS systems offer cost savings to merchants by eliminating the need to invest in physical hardware such as card readers and traditional POS terminals. While SoftPOS technology offers great opportunities, it may not be the right choice for everyone. In fact, the traditional payment terminal might be the smart choice for high-throughput retailers like supermarkets, where customers are buying in volume and have a very clear journey through the store, ending at the payment point. Existing payment terminals can operate at greater speed and benefit from high levels of consumer familiarity and trust. SoftPOS was only available to deploy on Android up until 2022, when also Apple announced the availability of SoftPOS apps on iPhone devices. The number of smartphones running SoftPOS is still less than 15 million, but this number is anticipated to grow fast. Companies betting on the SoftPOS market include Verifone, Ingenico, Worldline, Yazara, MineSec, Avantis Direct, Hitachi Payment Services, Softpay, IDEMIA and Surfboard Payments.

### Ensuring continuous service with multi-network POS solutions

Unlike traditional single-network solutions, a multi-network approach enables devices to connect to multiple networks. For payment terminal providers, there are multiple benefits of multi-network connectivity.

A single SIM that can access multiple networks in each location eliminates the need to test different SIMs and individual networks at each merchant deployment site. Instead, providers can deploy one standardized SIM in each device, knowing it will automatically connect to the best available network no matter where it goes in the world. This approach eliminates the need for multiple site visits, troubleshooting, and lengthy customer support calls for a POS to be deployed successfully.

Multi-network connectivity guarantees optimal performance by seamlessly switching to the best network based on location and traffic conditions. This automatic transition prevents downtime and allows merchants to maintain continuous service during peak times or in areas with unreliable coverage of a single network. The result is a reliable POS system that enhances customer experience by minimizing transaction failures and delays. Additionally, this approach reduces the need for manual interventions, freeing up resources for other critical business functions.

Multi-network connectivity can be achieved in several ways, including roaming arrangements and eSIM-based provisioning. Though the approaches vary, they serve a similar commercial purpose in reducing dependence on a single-network.

### How SGP.32 simplifies global POS terminal rollouts

The new IoT eSIM specification, called SGP.32, is intended to support remote provisioning of eSIMs and can be viewed as a framework that simplifies the management of multi-network connectivity in payment terminal deployments. The main benefit is lower operational complexity and improved resilience.

A key difference from other multi-network connectivity solutions is the ability to localize the connectivity in a standardized way through eSIM profiles from local mobile operators. For payment terminal vendors, this means that terminals can be manufactured in a single, standardized configuration and shipped globally, thereby streamlining manufacturing and logistics. Another key feature is a type of fall-back mechanism that enables the eSIM to switch to a pre-installed backup profile if quality of service degrades.

A key design principle for the development of the eSIM IoT specification was to leverage existing SM-DP+ systems, the infrastructure used for consumer eSIM services, in order to simplify and accelerate deployments. More than 400 mobile operators had deployed SM-DP+ systems at the end of 2025, which will be technically able to support IoT eSIM services.

Commercial eSIM solutions based on the SGP.32 specification are beginning to emerge following the launch of the first GSMA-certified IoT eSIMs in mid-2025. While adoption remains at an early stage, SGP.32-based deployments of payment terminals are in 2026 moving from trials to initial commercial rollouts.

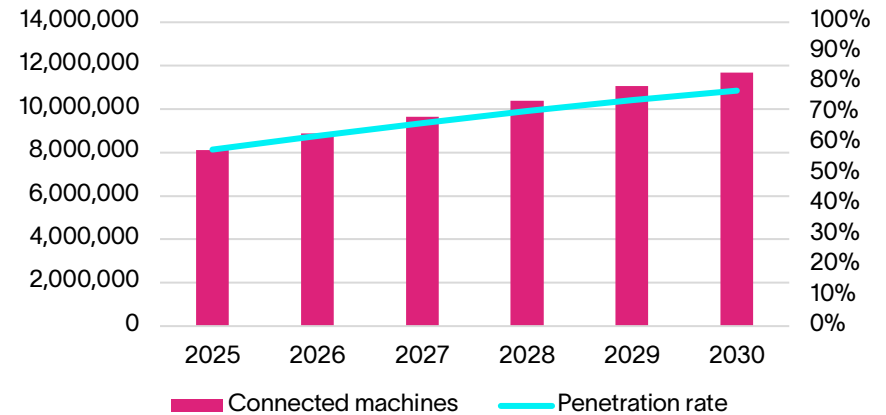
### POS systems in unattended environments

While commonly associated with traditional retail environments such as stores and restaurants, POS terminals are increasingly finding innovative applications across diverse sectors. Beyond traditional retail, POS systems are pivotal in environments where cashless transactions and seamless payment experiences are essential. These include unattended applications such as EV charging stations, vending machines, micro markets, laundromats and gaming machines. POS terminals also play an important role in collecting fares on buses, trains and subways, and in providing secure payments for medical services in healthcare settings.

### POS terminals allow vending and micro market operators to streamline operations

There are currently around 14 million vending machines in the world that dispense goods such as hot and cold beverages, foods, refreshments and other physical products to consumers on the go. Vending machines operate around the clock and can thereby offer products at any time, which is especially beneficial in areas with limited or no retail options. Coin mechanisms have historically been the most widely used payment system for vending machines. Today, however, cashless payments are generally seen as low-hanging fruit for the vending industry, as adding acceptance of credit and debit card payments via POS terminals does not require changes in the operating model. Sales data from cashless transactions can, for example, be integrated into existing financial reporting systems, while inventory management, replenishment and maintenance continue as before with the added benefit of more efficient operations. The Covid-19 pandemic further led to a surge in the popularity of cashless and contactless payments as users began to seek versatility, convenience and safety to a larger extent than before.

Figure 4: Installed base of connected vending machines (World 2025-2030)



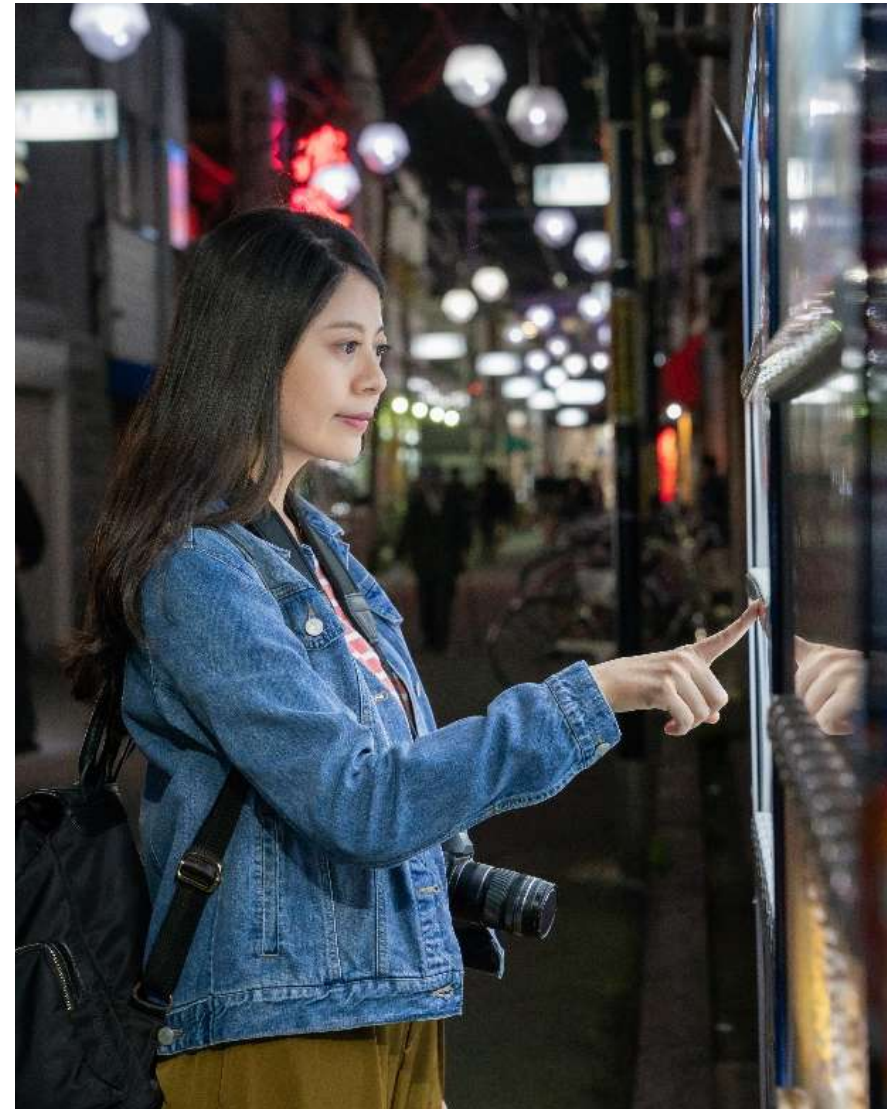
According to Automatic Merchandiser, more than 90 percent of US vending operators now use cashless payment devices. While adoption in other regions of the world remains more modest, cashless payments act as the single most powerful driver for adding connectivity to vending machines. Consequently, cellular POS terminals are expected to be the main source of connectivity for the vast majority of the world's 12 million connected vending machines by 2030. Its use is meanwhile not limited to offering users a convenient way to pay, but product suppliers and operators also leverage the connectivity from payment terminals to gain more efficient control of cash, sales, stock, route planning, operations and marketing data.

Closely related to vending machines is the concept of micro markets. These are stores in which consumers can access items such as pre-packaged food and pay for their selection at unattended kiosks, generally using cashless payments via a POS

terminal. In the US, micro markets have experienced significant growth in recent years, with the number of locations having increased from 13,000 in 2015 to nearly 56,000 in 2024. The concept has also started to spread to additional markets including Canada, Europe and Latin America. According to the European Vending Association (EVA), Europe now hosts over 10,000 micro markets, with more than 730 located in the United Kingdom at the end of 2024. As micro markets can offer significantly more product variety and broad assortment ranges, it is expected that the roll-out of micro markets will continue to see significant growth in the years to come as an alternative to both vending machines and traditional retail stores.

Positioned at the intersection of traditional vending machines and micro markets is also an emerging concept commonly referred to as grab-and-go machines or smart coolers. Unlike traditional vending machines, these machines do not rely on mechanical dispensing systems and instead allow users to grab and return products directly from shelves inside the machine. To open the machine, users must first complete a pre-authorization process, which is typically done by using a debit or credit card at an integrated POS terminal.

One reason for the growing popularity of grab-and-go machines is their ability to accommodate a wider range of products than traditional vending machines, particularly fresh foods and awkwardly shaped products. On the other hand, they require less space than micro markets and are cheaper to deploy. As a result, the concept is now gaining significant traction in Europe and North America as operators actively test the format to explore new product categories and more flexible retail configurations. As an example, the number of smart coolers in Europe increased by 95 percent between 2023–2024 according to EVA.





### POS terminals are a critical part of EV charging infrastructure

As the electrification of vehicle fleets continues, the roll-out of EV charging stations proceeds at pace. The number of public charging points in North America and Europe alone is expected to grow from about 1.7 million in 2025 to over 3.3 million in 2028. These will be placed throughout a variety of public spaces, such as transportation hubs, tourist destinations and commercial areas. At the same time, charging point operators need to collect payments and data from the charging stations.

Today, the most common ways of initiating payments for EV charging sessions are to use a mobile application or a radio-frequency identification (RFID) tag. An alternative to RFID tags and mobile payments is card payments using a POS terminal. The use of a dedicated payment terminal can help EV-charging operators to comply with the non-discriminatory ruling in Directive 2014/94/EU, as it allows all EV drivers with a credit or debit card to charge and pay. In addition, the Alternative Fuels Infrastructure Regulation (AFIR) came into force in April 2024, which stipulates that public charging infrastructure in the EU with power outputs of 50kW and above must include the option to pay with a credit card, either contactless or via swipe, chip or dip. In the US, federally funded charging points similarly need to offer users the ability to pay using a credit card.

Besides helping operators adhere to regulations, the use of POS terminals at EV charging points enables drivers to avoid installing various mobile apps or carrying RFID cards from different operators. POS terminals also ensure that drivers are not restricted by unreliable network connections at EV charging stations, which could otherwise impede their ability to download and install mobile applications.

### Conclusions and strategic recommendations

Several parallel market and technology shifts are currently reshaping the POS industry, potentially establishing new market dynamics for payment operations in the long term. Below, we highlight key trends emphasizing the crucial importance of multi-network connectivity.

Against this backdrop, the conclusions and recommendations below highlight how POS terminal estate owners can reduce risk, improve total cost of ownership and build a connectivity foundation that scales across countries and product generations.

- The uptake of cellular IoT connectivity in the POS market has been driven by vertical markets where mobility is central and where fixed-line telecommunications infrastructure is less developed. Future growth will be driven by multi-network solutions that ensure consistent performance in areas where reliable connectivity is not possible through Wi-Fi or cellular single-network connectivity.
- Connectivity failures have a direct and significant impact on the financial performance of merchants, but the costs extend beyond mere monetary losses to encompass operational disruptions, customer dissatisfaction, and potential damage to brand reputation. To mitigate this risk and to reduce costs related to on-site visits and lengthy customer support calls, POS providers will adopt multi-network solutions for enhanced reliability and flexibility.
- The growing use of payment terminals in unattended environments such as EV charging infrastructure is expanding the market for POS systems, which is likely to open up more use cases for cellular connectivity in general and multi-network connectivity in particular.
- Consumers today are increasingly opting for convenience, speed and ease of use when conducting transactions. As a result, the POS industry is undergoing a significant transformation driven by the increasing reliance on cashless payments and the opportunities they present. To enhance the customer experience, it is therefore vital for POS providers and merchants to ensure uninterrupted services and product reliability.
- Multi-country deployments benefit from planning for scale and change from the outset. Remote SIM provisioning, centralized connectivity management, and bulk activation and suspension reduce friction over time.
- The new IoT eSIM specification SGP.32 will simplify connectivity management and localization for payment terminal vendors by enabling terminals to be manufactured in a single, standardized configuration and deployed globally. This can reduce operational complexity and support more scalable international rollouts by enabling remote downloads of local operator profiles when and where needed.

# Appendix: IoT Connectivity Evaluation Framework for POS terminals

## 1. Understand Business Needs & Use Cases

- Define core objectives (tracking, monitoring, automation, etc.)
- Identify device types, expected volumes, and geographies
- Map requirements to business outcomes

## 2. Short-Term vs. Long-Term Deployment

- Short-term: speed of rollout, ease of integration
- Long-term: scalability, global coverage, contract flexibility

## 3. Connectivity Technology Landscape

- Assess available technologies (2G/3G sunset, LTE-M, NB-IoT, 4G, 5G)
- Match technology to device lifecycle and data requirements

## 4. Connectivity Provider Selection Criteria

- Network coverage and quality
- SIM/eSIM capabilities
- Management platform and APIs

## 5. Vendor Stability & References

- Choose partners positioned for long-term viability
- Verify customer references and case studies
- Review financial health and market presence

## 6. Build a Procurement Strategy

- Align internal stakeholders (IT, procurement, operations)
- Define selection timelines and evaluation criteria
- Balance technical needs with commercial priorities

## 7. Evaluate Vendors: Test, Pilot, Compare

- Run proof-of-concept deployments
- Assess ease of integration and support responsiveness
- Compare performance across regions

## 8. Use a Scoring Matrix

- Create weighted criteria (coverage, cost, platform features, SLAs)
- Use scores to drive objective decision-making

## 9. Cost Models & Flexibility

- Review pricing options (per SIM, per MB, bundled plans)
- Look for flexibility as volumes and geographies change
- Check for hidden fees (roaming, activation, termination)

#### 10. Security, Compliance & Risk Management

- Ensure compliance with local regulations (GDPR, HIPAA, etc.)
- Review encryption, authentication, and data isolation practices
- Assess vendor's incident response processes

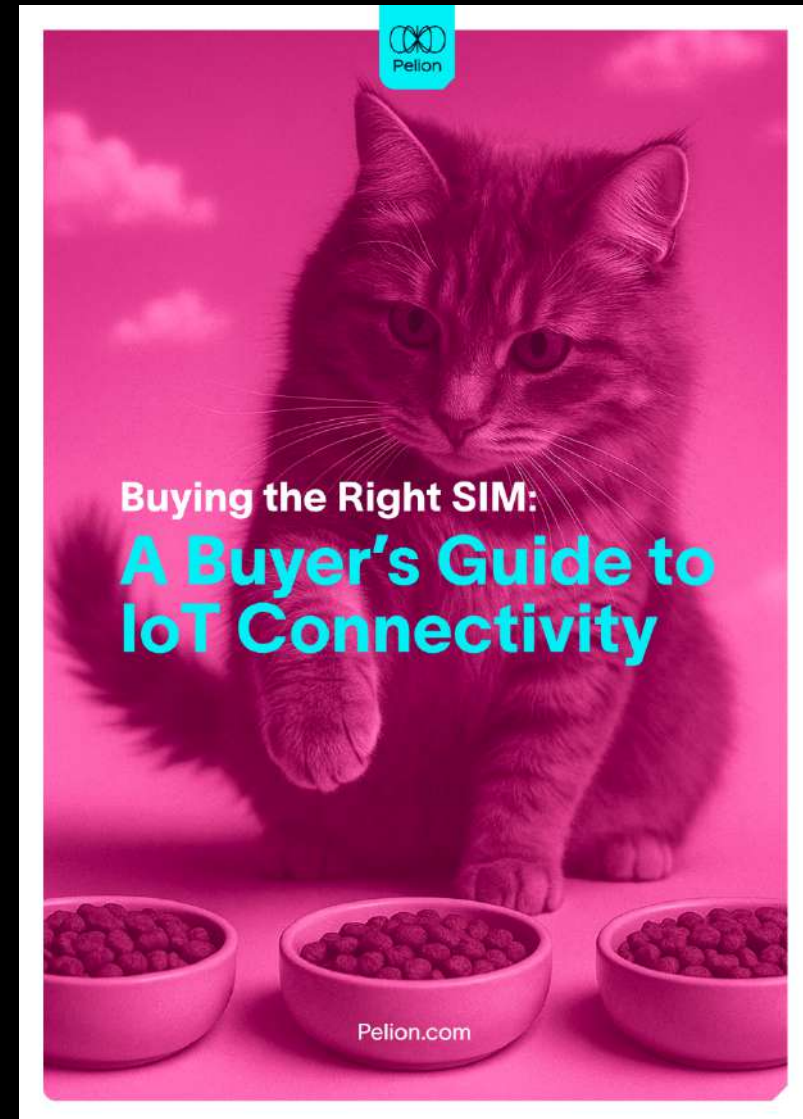
#### 11. Managing Scale

- SIM lifecycle management (activation, suspension, replacement)
- Roaming agreements for cross-border deployments
- Global reach through multi-network or aggregator models

#### 12. Procurement Process Flow

- Draft RFP with clear requirements
- Shortlist and evaluate vendors against scoring matrix
- Negotiate contract terms and SLAs
- Finalize vendor and initiate rollout

Access Pelion's full buyer's guide to IoT connectivity [here](#)





Pelion offers a comprehensive cellular IoT connectivity solution designed to meet rigorous IoT connectivity requirements. Our global multi-network SIMs include eUICC-enabled eSIM profiles for seamless carrier switching, ensuring robust coverage and resilience.

Pelion's connectivity management platform, the Pelion Portal, features an intuitive self-service portal, extensive APIs, and integrations with leading cloud providers. The solution prioritizes security through end-to-end encryption, and compliance support.

With scalable pricing, unified billing, and strong SLAs delivering industry-leading uptime of 99.995%, it doesn't matter whether you're deploying 10 devices or 100,000 across continents – Pelion enables secure, resilient, and scalable cellular IoT connectivity.

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