



**Global
Platform®**

Securing the digital future

Meeting the Needs of Payment Schemes in the Evolution of Secure Element Technology

Why payment schemes *must* define roadmap requirements for device features and functionality *now*, to ensure SEs support trusted payments innovation in the future.

This eBook explores:

- The evolution of SE technology and why payment schemes must input into and adopt the latest GlobalPlatform Card Specification.
- The GlobalPlatform Financial Configuration and the value payment schemes gain from specifying their current and future requirements.
- How the Financial Configuration eases certification processes.
- Why it's important for payment schemes to validate the presence and performance of key functionality in SE technologies, to ensure consistent and secure user experiences, regulatory alignment, and much more.

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Embedded secure components are changing traditional business models; a more diverse and complex population of stakeholders than ever is now specifying future core device functionality and features. As GlobalPlatform embarks on the development of GlobalPlatform Card Specification (GPCS) v2.5, there are many voices at the table. It's critical for payment schemes to engage and define their requirements if core features and functionality, crucial to payments, are to remain supported on devices in the future.

Gil Bernabeu, CTO, GlobalPlatform

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Card-based payments can be made using an ever-increasing range of cards, smart phones, wearables and other devices, thanks to the secure storage and processing of payment card data in each device's Secure Element (SE).

These payments are possible because SE technology supports the functional and security requirements of both EMVCo and the payment schemes.

Historically, payment community requirements have been widely understood by the limited number of SE vendors responsible for developing and providing secure component technology globally. The relationship between payment schemes and traditional SE vendors has always been strong and collaborative.

Yet the evolution of payment use cases and SE technologies over the past decade has led increasingly to secure components becoming embedded within devices. These embedded secure components provide new secure services for the device, applications and a brand new remote management mechanism based on Public Key Infrastructure (PKI).

This development has changed traditional business models and is shifting relationship dynamics. A much broader, less analogous population of stakeholders, including global tech giants and device manufacturers, is now specifying the future core features and functionality of secure components. And payments represents only one of a growing number of secure applications whose requirements are top of mind.

At the same time, the needs of the payment community are changing; payment cards continue to embed new innovations and require state-of-the-art runtime environments. In parallel, crypto agility is more important than ever to answer cybersecurity regulation and the evolution of services.

The needs of the payments community must be championed loudly as SE technology continues to evolve. If this doesn't happen, there is a real and present risk that device features and functionality may not support payment scheme roadmaps, and the specific needs of the payments community, in the future.

Payment schemes should fully engage in GlobalPlatform's collaborative work efforts to maintain and develop SE specifications, to be sure that their requirements are met and that key technology elements are not deprecated or removed in future versions of the GlobalPlatform Card Specification (GPCS).

For SE technology to support future trusted payments innovation, and to be certified as meeting payment scheme (and regulatory) requirements, those requirements must be clearly defined, communicated and understood.

The GlobalPlatform Card Specification

Making secure payments over devices possible, now and in the future

GlobalPlatform SE technologies comprise the GlobalPlatform Card Specification (GPCS) and various configurations, including the Financial Configuration.

The GPCS is foundational to more than 80 billion SEs deployed globally to enable payments, identity and a range of other use cases. The latest release – GPCS v2.4 – integrates key updates, amendments and learnings from widespread deployments over the past decade. Many of these technology evolutions have been made to support the continually advancing needs of the payments community:



Updated communication protocols

Including Serial Peripheral Interface (SPI), Inter-Integrated Circuit (I²C), and Improved Inter-Integrated Circuit (I³C) to support a wide range of devices and use cases.



Support for payment card innovation

Examples include Dynamic Card Verification Value (CVV) to improve payment security, embedded light-emitting diodes (LEDs) for cardholder interaction, and biometric sensors for strong customer authentication.



Enabling crypto agility

Support for Advanced Encryption Standard (AES) cryptography which is more resistant to the quantum computing threat.



Innovation support

Enabling third-parties to deploy and protect their services and applications in the SEs to support innovations like digital identity wallets, payments passkeys and central bank digital currencies (CBDC).

Define the future of device security

In 2026, GlobalPlatform will commence work on the next major specification update, GPCS v2.5. GlobalPlatform and its members are the guardians of the specification and, as the SE ecosystem expands and new use cases evolve, an increasing number of stakeholders are joining the effort to define the future of device security. Payment schemes need to be represented among the many voices at the table.

Only by engaging and clearly defining their requirements, can payment schemes ensure that core device features and functionality needed to support future payments innovation remain supported.

The GlobalPlatform Financial Configuration

Supporting easier deployment & faster adoption of your payment products

GlobalPlatform Configurations compliment the GPCS by helping stakeholders in particular markets identify the relevant functions and features for them and their needs, and act as a 'how to' guide for implementing the GPCS in line with key use cases. The GlobalPlatform Financial Configuration is the main reference point for banking, payments, wearable, digital wallet and other stakeholders seeking to protect their devices and services with SEs. It is also the basis upon which products are certified for use in financial services use cases, confirming that all functional requirements of the configuration are present and behaving as intended.

In line with current GPCS work efforts, GlobalPlatform is updating the Financial Configuration in parallel. Payment schemes are being actively invited to engage in this initiative, specifically to specify their functional and security requirements for different SE product implementations across cards, smartphones and wearables.

This will help the broader ecosystem, including device and SE manufacturers, understand the support future devices need to offer to successfully and seamlessly host payment applications and services. This also ensures they are prepared to support innovations within payment scheme roadmaps.

By openly specifying requirements, payment schemes can be sure that their ecosystem partners have an unambiguous understanding of what features and functionality need to be present in products supporting their applications and how they are expected to perform. This transparency leads to an easy, quick and efficient certification route.

Specify requirements in the Financial Configuration, benefit throughout your value chain

A Financial Configuration which includes all payment scheme requirements, becomes a detailed 'how to' implementation guide for the entire supporting ecosystem. Collaboration between payment schemes, technology vendors, banks and other stakeholders becomes much simpler and smoother. The result? Greater consistency and interoperability across the payment application lifecycle.



Define the configuration

Payment schemes help to define the Financial Configuration with potentially specific sets of functions, ensuring current and future requirements are detailed and clearly communicated to their ecosystems.



Build technology

Technology vendors have a clear set of requirements from which to develop valuable and cost-effective products that are aligned with scheme and regulatory requirements, and future roadmaps.



Validate compliance

Payment schemes can then require a certified 'stamp' for products to be deployed in their networks and which host their payment applications, delivering confidence that SEs deployed in cards, wearables and smartphones support the required functionality to host payment applications.



Simplified procurement

Banks, device manufacturers and other stakeholders have a well-defined set of payments-enabled SE products available to them, simplifying procurement processes.



Deploy with confidence

End-users benefit from a consistent, secure user experience across cards, smartphones and wearables, fostering trust.

GlobalPlatform Certification

Prove regulatory compliance & deliver seamless user experiences

With new stakeholders emerging and integrating into the payments community, it is essential that the community can easily prove compliance to the functional requirements of payment schemes. As the payments ecosystem continues to expand and converge with new industries like identity and automotive, it is also important to promote compliance within an increasingly complex regulatory landscape.

Independent testing and certification of SE products used to host payment applications is a fundamental step in the process to unlock many benefits for payment schemes and their stakeholders across the ecosystem.

Payment schemes benefit from certifying that products meet their requirements by:



Ensuring consistent user experience across payments use cases and devices, by ensuring interoperability across SE products.



Validating the products perform as intended and that key security features and functionality are present in SE products.



Protecting payments data, applications, intellectual property and therefore brand reputation.



Ensuring compliance with regulation like the EU Cyber Resilience Act (CRA) and Post Quantum Cryptography (PQC) migration.

Helping the payments ecosystem ensure regulatory compliance

GlobalPlatform has close partnerships with key regulators globally, and as a result, various regulations and mandates are aligned with GlobalPlatform technologies. By specifying that your products must pass GlobalPlatform certification processes, payment schemes can ensure products and components are in line with the latest regulatory requirements around cybersecurity and data privacy, such as the Cyber Resilience Act in Europe and timelines for migration to Post-Quantum Cryptography. Remote management and updates for vulnerability management are central to both of these initiatives.

Secure Elements Need Remote Management

Remote management and over-the-air updates are fundamental features of GlobalPlatform technologies. If testing and certification only focuses on how to perform the EMV transaction through EMVCo, schemes are not confirming if the SE products in their ecosystems support the required remote management and update functionality to align with regulatory requirements.



Get
involved

Next steps for payment schemes

Payment schemes are uniquely placed to drive consistency and trust across the payments ecosystem by ensuring the Financial Configuration clearly defines their requirements for features and functionality that are supportive of their roadmaps. They can also mandate certification for the functional features required to enable payments use cases, to ensure peace of mind and enable collaboration across the value chain.

Some payment schemes are already committed to this initiative or are taking steps to foster this trust.

All payment schemes are invited to engage with GlobalPlatform in the following ways:

1 Collaborate on GPCS development

Stakeholders can participate in the work of GlobalPlatform's SE Committee to ensure their requirements are integrated into the next iteration of the GPCS, version 2.5. Work on this is now starting and GlobalPlatform anticipates that some features and functionality will be deprecated and removed, while others will be added. This will reflect emerging innovations, use cases, additional remote management features and market evolutions like Post-Quantum Cryptography, as signaled by the input / contributions of influential key players of the global digital security ecosystem.

Get involved to have your say.

2 Contribute to the Financial Configuration

To support the payments community, GlobalPlatform is launching an initiative to update its Financial Configuration and is calling on the payment schemes to engage in this effort by specifying their functional and security requirements for different SE product implementations across cards, smartphones and wearables.

3 Mandate certification of SE products within your scheme

By requesting that SEs are functionally certified as an essential part of certification processes, payment schemes can ensure the presence of required security features and product functionality to deliver consistent user experience, regulatory alignment and more.

Contact Gil Bernabeu, CTO, to get involved.



CTO@globalplatform.org



How does the GlobalPlatform Card Specification Support Trusted Payments Innovation?

The GPCS was the foundation for the first wave of payments digitalization. Its evolution is perfectly placed to support a new wave of payments innovation delivered across SE technology



80 billion+

GlobalPlatform SEs shipped in smartphones, smartcards, and IoT devices, providing a tamper-proof solution for digital transactions and cryptographic processing



13 billion+

active bank cards providing secure, flexible payment experiences



\$1.6 trillion+

of contactless payments processed using GP TEEs on smartphones in 2024



The widespread adoption of GlobalPlatform's leading-edge, standards-based security technology empowers the payments industry to deliver secure devices and innovative services, enabling users to engage in a digital ecosystem built on privacy security and trust.



Fostering trust

GlobalPlatform technologies serve as the bridge between devices and services, ensuring seamless and secure transactions and interactions.



Enabling flexibility

GlobalPlatform technologies protect multiple applications running on the same platforms and chipsets, allowing them to run independently and in isolation.



Creating control

GlobalPlatform technologies are available to all and developed independently from any chip platform, helping payments stakeholders retain complete control over their digital services.



Ready for future threats

GlobalPlatform future-proofs digital security against quantum computing and AI-driven threats, adapting to the ever-evolving digital landscape.



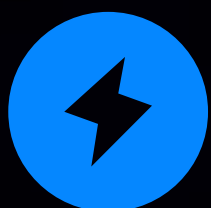
Business enabler

GlobalPlatform is the universal language helping payments stakeholders to discuss and implement security swiftly, simply and efficiently.



Delivering reach

GlobalPlatform uniquely brings consistent security and performance to services across cards, smartphones and wearables, and helps stakeholders deploy services to devices already in end-users' hands.



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