Felix Payment Systems secures SoftPOS solution with In-App Protection
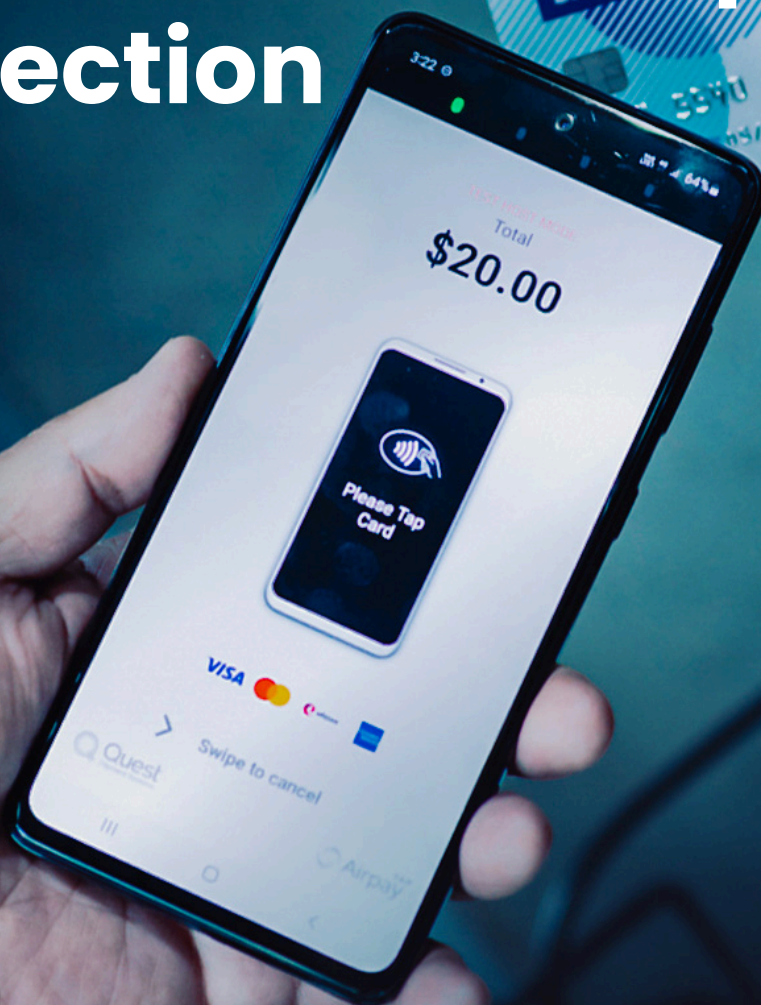
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Felix.™

Industry
Payments Industry

Locations
Vancouver, Canada
Melbourne, Australia

Solution
zKeyBox
zShield

Customer Profile

Felix Payment Systems (FPS) is an international product development firm with offices in offices in Vancouver, Canada and Melbourne, Australia.

Felix.Terminal helps merchants accept payments anywhere on their smartphones, without requiring proprietary card reading hardware or dongles.

FPS specializes in cybersecurity, mobile payments, and Chip and PIN technology. As the world of e-commerce and mobile payments continue to grow at an exponential rate globally, the opportunities and risks grow along with them. The products developed by FPS are designed to capitalize on both the growth and risks present in the market.

The firm has a suite of patent-pending products that enable traditional retail and e commerce businesses to accept payments by turning mobile devices into EMV (formerly Europay, Mastercard and Visa) capable payment terminals.

The company's merchant application, Felix.Terminal is a payment processing technology that enables customer payments to be processed on consumer grade Android phones by tapping contactless bank cards against the back of the smartphone.

Felix.Terminal provides the user interface and contactless card-reading capability using Near Field Communications (NFC).

After reading the card data, Felix.Terminal encrypts it, and sends the payment data off to the firm's innovative middleware application, Felix.Cloud, which is running in a secure cloud environment.

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"Intertrust's whiteCryption [now part of Zimperium] is very well supported and highly regarded inside the major card brands," notes Felix Payment Systems founder and CEO Owen Newport. "By going with whiteCryption [now part of Zimperium], the credit card security assurance groups and PCI allowed us to utilize PIN validation when required."

Felix.Cloud provides the PCI-compliant security infrastructure and back-end messaging layer that enables Felix.Terminal to be linked up with the traditional payment systems used by financial services providers.

The Challenge

Traditional mobile point-of-sale (mPOS) solutions have, until now, required costly and inconvenient card readers or dongles to be used in conjunction with a mobile phone to interact with payment cards, particularly for transactions requiring a PIN code. These devices add unnecessary cost and complexity to the solutions in both the cost of the hardware itself, the hardware certifications required, as well as distribution and maintenance of the infrastructure.

However, the majority of Android handsets deployed today already include an NFC interface. This creates an opportunity, as this interface can be used to communicate directly with a contactless card or other contactless payment instrument like Apple Pay or Google Pay. Mobile phones equipped with the Felix.Terminal application can become a complete payment acceptance device, with no need for specialized additional hardware.

The Felix.Terminal mobile application communicates with its back-end cloud counterpart—Felix.Cloud. All of the transaction processing occurs on Felix.Cloud, with the phone mainly acting as a user interface and card reader.

Because sensitive data and payment information is transmitted back and forth between Felix.Terminal and Felix.Cloud, some of the immediate challenges and needs from a security perspective were as follows:

- Increase security depth for Felix.Terminal and Felix.Cloud to secure any financial and personal data being sent through the app.

- Find a common security solution which could be easily integrated into the code base of both products, one on a mobile device, the other in the cloud.

- Secure all data transmitted back and forth between Felix.Terminal and Felix.Cloud.

- Protect Felix.Terminal and Felix.Cloud from reverse engineering and tampering.
- Ensure the encryption keys are protected at all times on both Felix.Terminal and Felix.Cloud.

- Adhere to or exceed card brand and PCI security guidelines and compliance restrictions.

- Provide proactive security on Felix.Cloud before onboarding multiple high-traffic high-transaction clients around the world.

- Build solid pilot projects with positive results that negate any security threats or attacks.

The Solution

FPS considered six security solution providers in its quest to provide the highest possible level of application shielding for its SoftPOS system. FPS and Zimperium started working together in early 2019.

Zimperium's zShield and zKeyBox solutions protect both Felix.Terminal and Felix.Cloud.

The Zimperium security solutions were implemented and deployed by FPS and enable both Felix.Terminal and Felix.Cloud to adhere to the security requirements of the payments industry, including full compliance with PCI Data Security Standard (PCI DSS).

Application shielding to secure the Felix payment system

zShield

is a development tool deployed into the application build process for Felix.Terminal and Felix.Cloud to deliver a self-defending and protected mobile application. It employs advanced code obfuscation and control flow flattening to remove any hard-coded messages or strings, replacing them with unrecognizable versions.

The application flow is radically changed without affecting the logical functioning of the app, making it hard to understand the logic and deterring hackers from understanding the code or being able to extract any sensitive IP.

"We know that whiteCryption [now part of Zimperium] will continue to be there to support us at every stage. We're confident in the security of our applications, our transactions, and our customers' data."

In addition, thousands of overlapping integrity checkers are embedded into the code, each one checking a section of the binary. These checkers are very hard to find and extremely time consuming to remove, so if the application is modified, Felix.Terminal will detect it and run a custom defense function, terminating the application or executing preferred code. The payment system can also detect whether it is being executed in a debugger or running on a rooted device.

zKeyBox

is an advanced white-box cryptography (WBC) library that protects cryptographic keys from being accessed or extracted. The keys are always encoded, even when in use.

The Felix SoftPOS system supports card scheme (Visa/Mastercard/AMEX) host card emulation (HCE) and the creation of PIN authorization blocks. The use of zKeyBox technology ensures that all cryptographic aspects of the product are secured, making it almost impossible to access or tamper with the keys in any way.

zKeyBox is the market leading white-box cryptography library, ensuring attackers cannot gain access to cryptographic keys. zKeyBox is regularly tested by top-tier pen testers at Zimperium customer sites and through third party labs such as Riscure.

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The Results

The Felix SoftPOS system is running a live pilot within a number of countries where EMV cards are widely used, including Canada, the United Kingdom, and Australia. It is estimated that 80 percent of transactions that take place in these countries are conducted using contactless (tap-and-go) technology. Zimperium solutions have saved Felix Payment Systems hundreds of hours in development time and provided faster market acceptance among major payment card brands.

Additionally, the Zimperium application shielding solutions provide FPS and its Felix SoftPOS system with these essential benefits:

Deeper Capabilities

- Ensures secure exchange of information between Felix.Terminal and Felix.Cloud, fully protecting the end user's financial and personal information.
- Increases security depth by protecting the Felix codebase from penetration by static and dynamic analyses, hacking, and piracy.
- Introduces proactive security to avoid unexpected circumstances which could distort the image of the brand, the merchants, or the card issuer.

Attaining Security Compliance

- Security compliance for fast market acceptance was accelerated thanks to Zimperium's market leading position and certification to the highest standards.

Easy Integration with Wide Platform Support

- Cross-platform, cross-language capability provided easy integration and was a key deciding factor for FPS. It meant Zimperium solutions easily supported Felix.Terminal's Android Java and Felix.Cloud's C++ code, saving time and resources.

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Learn more at: zimperium.com
Contact us at: 844.601.6760 | info@zimperium.com
Zimperium, Inc
4055 Valley View, Dallas, TX 75244