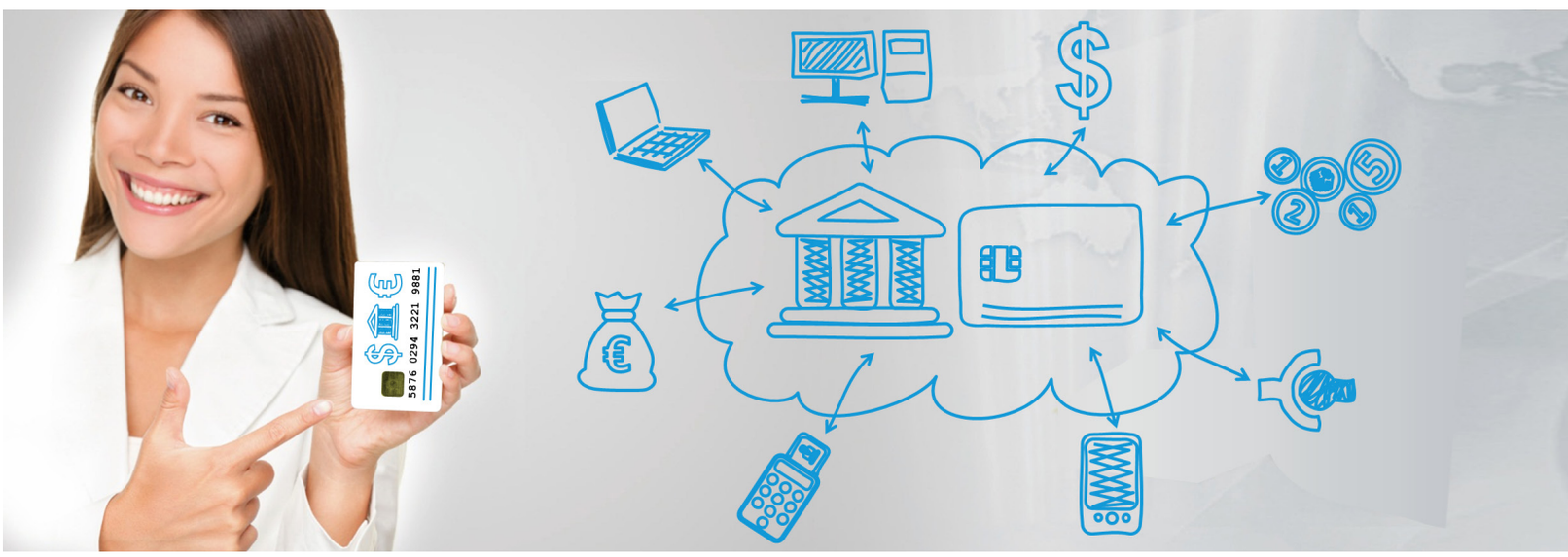
cryptovision

eBanklet

Java based payment framework



eBanklet is an innovative Java based card solution providing a complete set of EMV payment applications. With eBanklet you can realise a credit or payment card in a simple and highly flexible way.

MANAGEMENT SUMMARY

The EMV standard has revolutionized the payment card sector. It has introduced secure and standardised smart card solutions providing worldwide interoperability. One possibile way to realize EMV-compliant cards is the Java Card technology. Java Card based EMV solutions have been around for over 15 years – usually based on standard Java Card operating systems. While these systems work reasonably well, they have serious drawbacks. Most of all, EMV requires only a small part of Java Card functionality, which makes such a solution expensive and introduces additional complexity as well as security risks.

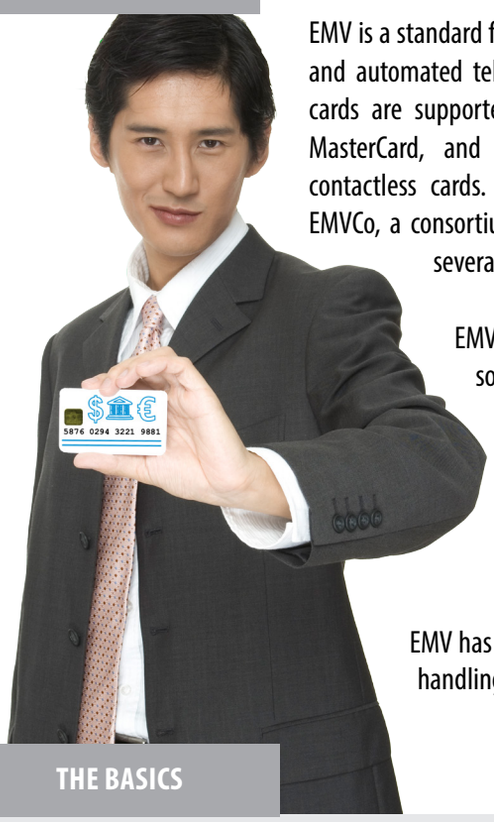
eBanklet, a product developed by cryptovision together with partner jNet Technology, is a next generation EMV solution. It is built on top of µJavelin, a new Java based card operating system that can be tailored to different markets and verticals, including payment, eGovernement (electronic identity cards), and secure Internet of Things. Post issuance applet loading is supported.

eBanklet uses a µJavelin version that is tailor-made for payment applications. Most of the required functionality, including optimized cryptographic operations and secure data storage, are provided by the operating system. Many standard Java Card features not required for EMV have been stripped off. Following a lean design philosophy, µJavelin is highly optimized, providing a reduced memory footprint (less than 128K) and unrivaled performance.

While the payment-tailored version of µJavelin is not Java Card compliant due to the stripped-off parts, it is a lean solution ideal for EMV use. Like other solutions based on µJavelin, this one has low certification and maintenance costs.

BACKGROUND

What Is EMV?



EMV is a standard for payment cards, payment terminals and automated teller machines. Both credit and debit cards are supported. EMV, which stands for Europay, MasterCard, and Visa, supports both contact and contactless cards. The EMV standard is managed by EMVCo, a consortium with control split equally among several major payment card companies.

EMV was created to supercede payment solutions based on magnet-stripe cards as well as proprietary smart card payment solutions. Meanwhile EMV has been implemented by all major payment card technology suppliers, which results in worldwide interoperability. EMV has considerably simplified payment card handling in recent years.

The most widely known chip card implementations of the EMV standard are:

- VIS – Visa
- Mastercard chip – Mastercard
- AEIPS – American Express
- UICS – China Union Pay
- J Smart – JCB
- D-PAS – Discover/Diners Club International

Each of these implementations integrates vendor-specific, proprietary modules into a standardised framework.

EMV has made magnet-stripe cards (which are insecure) and proprietary smart cards (many of which had security weaknesses) obsolete and has replaced them with an architecture based on modern security concepts. For this reason, EMV has improved card payment security considerably.

THE BASICS

eBanklet

eBanklet is a next generation Java based card solution for realising EMV-compliant payment cards. EMV (Europay, Mastercard, Visa) is a standard devloped by the major credit card companies aiming to create worldwide interoperability in the payment card area. eBanklet was developed by cryptovision together with partner jNet Technology. Additional applications can be developed and used according to the customer's requirements.

Many banking applications supported

eBanklet supports the standard functionality of all major credit card suppliers: Visa (VSDC), MasterCard (M/Chip Advance/Select), Discover (D-PAS) (optionally), and American Express (AmEx) (on request). A card can be configured to support several technologies independent from each other. Additional functionality can easily be added, based on existing or newly developped applets.

Banking-tailored card OS

Instead of a Java Card operation system, eBanklet uses µJavelin, a new and innovative Java based card operating system. µJavelin is provided by cryptovision partner jNet Technology, a California based IT company that has been specialising in Java and Java Card solutions for over a decade. jNet Technology's µJavelin operating system is used in a version that is tailor-made for payment services. While this version is not Java Card compliant, as some standard Java Card functionality not needed is stripped off, it is ideal for payment applications.

Small memory footprint

Following a lean design philosophy, the µJavelin card operating system is used in a highly optimized and reduced version. This results in a very small memory footprint of less than 128K and low hardware costs. For the same reason, eBanklet renders an unrivaled performance.

Fast personalisation

Because of the lean design and its payment-oriented architecture, smart cards realised with eBanklet can be personalised in less than a second per card. Competing solutions require significantly more personalisation time.

Loading of additional applets

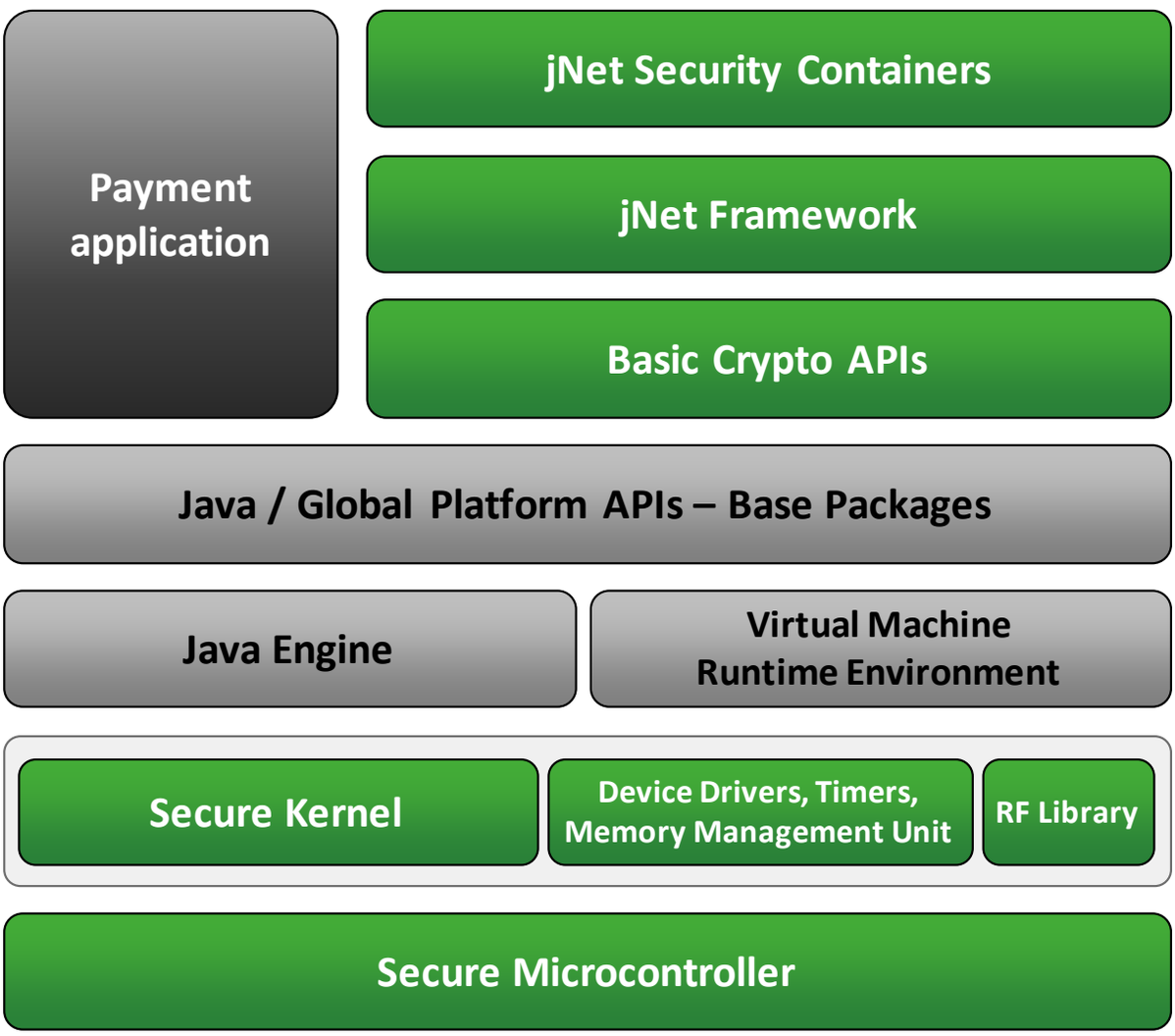
Even though the payment-optimized version of µJavelin is not Java Card compliant (due to stripped-off functionality), it still supports the loading of additional applets according to the Global Platform standard – also post-issuance.

Convergence

Convergence with cryptovision's government ID and enterprise IT offerings is possible. For instance, government issued eID cards with credit card functionality as well as credit cards with electronic signature function can be realized.

THE TECHNICAL PART

eBanklet is a modular solution. It provides a complete set of EMV payment applications that can be used to realise a credit or payment card in a simple and highly flexible way.



THE MODULES

Banklet is comprised of the following modules:

- **Visa**: VSDC v2.8.1G (v2.9)
- **MasterCard**: M/Chip Advance/Select
- **Discover**: D-PAS – optional
- **American Express**: AmEx – optional

SUPPORTED SYSTEMS

eBanklet (including the µJavelin operating system it is based on) runs on all common smart card types. Due to the lean design, even low-end card versions can be used.

Success story

cryptovision's Java and Java Card based smart card solutions are used by numerous government and enterprise customers. For instance, the government of Nigeria, which has launched a national identity card project for its over 160 million citizens, uses this technology. The Nigerian eID card, which has been deployed following an ambitious Presidential initiative, includes an ICAO compliant travel application, a national eID application, and a digital signature application featuring support for biometric Fingerprint Match-on-Card functionality. Credit card payment is supported, too. The number of applications will grow in the future stages of the project thanks to the unique architecture of cryptovision's card solutions, which enables infield update and provide additional features.

Customers

cryptovision's card solutions are used by the following customers:

- Bundesdruckerei: The national German security printing house uses a cryptovision Java Card solution to enhance their electronic identity card (eID) portfolio.
- South American country: A country with more than 10 million citizens in South America is now using cryptovision Java Card technology for both, the electronic Passport and the national electronic ID document.

About cryptovision

cryptovision is a leading supplier of innovative cryptographic IT security solutions. Based on its two decades market experience and broad background in modern cryptographic techniques, such as Elliptic Curve Cryptography, all cryptovision products provide the most state-of-the-art and future-proof technologies. The company specializes in lean add-on components which can be integrated into nearly any IT system to gain more security in a both convenient and cost-effective way.

From small devices like citizen eID cards, all the way to large scale IT infrastructures, more than 500 million people worldwide make use of cryptovision products every day in such diverse sectors as defense, automotive, financial, government, retails and industry.

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