



MIFARE Technology Platform

Enabling campus card applications worldwide



Carlos Paternain
Porto, May 2013



A photograph of a high-speed train at a station platform. The train is blurred, indicating motion. Several passengers are standing on the platform, waiting. The platform has a yellow safety line. A sign on the platform reads "澳門台民中心" (Macau People's Center) and "澳門交通發展局" (Macau Transport Development Bureau).

1.2 Billion people have access to our MIFARE™ contactless ticketing technology, making public transportation more convenient and efficient

A person in a blue suit is holding a white access card. The card features a photo of a man, a yellow chip, and the NXP logo. The background is a modern office hallway with large glass windows and a person walking in the distance.

200M+ people rely on NXP technology
to enter their offices and hotels every day

Source: NXP

MIFARE™ by the Numbers

>1000

Partner Network

www.MIFARE.net

>650 Cities

>50 Countries

Adopted MIFARE
solutions

>5 billion
Cards and Tickets ICs

>50 million
Reader ICs

Shipped

>40

Application Types

>10

Breathrough
Innovations

First time to market



MIFARE™ is leading in many other applications

Loyalty	Event Ticketing	NFC Tags	Micro Payment	Road Tolling	Student Cards
					
<p>Increased customer engagement through convenience</p> <ul style="list-style-type: none"> ▶ Cardholders earn points to get discounts and advantages ▶ Loyalty points are securely stored on the card for offline earning and spending 	<p>Contactless technology enhancing the experience</p> <ul style="list-style-type: none"> ▶ Stadium access, micro payments, parking and membership services ▶ Seasonal cards and single tickets ▶ Anti counterfeiting and black listing 	<p>Convenience for NFC interconnections and smart information sharing</p> <ul style="list-style-type: none"> ▶ Ideally suited to the broadest range of industries ▶ Interactions require no more than a simple touch 	<p>Speed and security for closed loop micro payments</p> <ul style="list-style-type: none"> ▶ Fast cashless transactions ▶ Suitable e.g. for shops near subway stations, canteen payments or loyalty cards 	<p>Fast and reliable way to pay for the highway</p> <ul style="list-style-type: none"> ▶ Cost efficient way to collect money for highway operators. ▶ Pre-paid and postpaid cards solutions possible. ▶ Convenience for drivers 	<p>Reliable multi-application solution</p> <ul style="list-style-type: none"> ▶ Physical access to university and student home buildings ▶ Micro payment for student restaurants ▶ Logical access to PCs and services

Air Asia frequent flyer card (2Mpcs/year)

German blood donor card (1,5Mpcs/year)

Season tickets of Manchester United, Real Madrid and Bayern Munich

Tickets for the soccer world championship

Explosive growth with smart posters, store advertising and access to content download

Indonesian theme parks (1,5Mpcs/year)

BaShiBa card HongKong (1 Mpcs/year)

Vietin Bank (1 Mpcs/year)

KGS Road tolling Turkey (3Mpcs/year)

Touch'n'Go Malaysia (2Mpcs/year)

European Campus Card Association using MIFARE (5Mpcs/year)

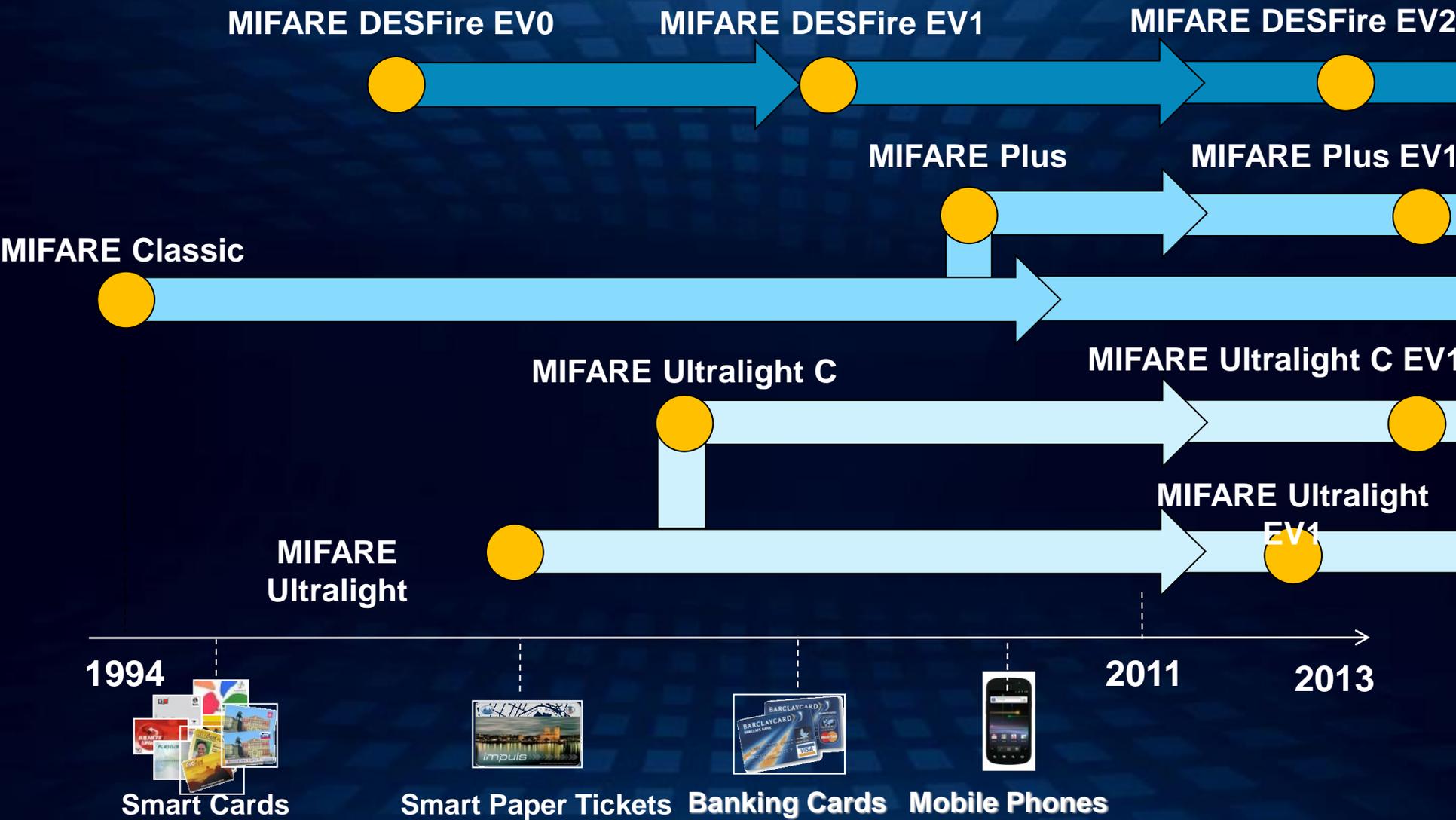
Growing number of Chinese campus cards using MIFARE

MIFARE card IC portfolio

Key Features

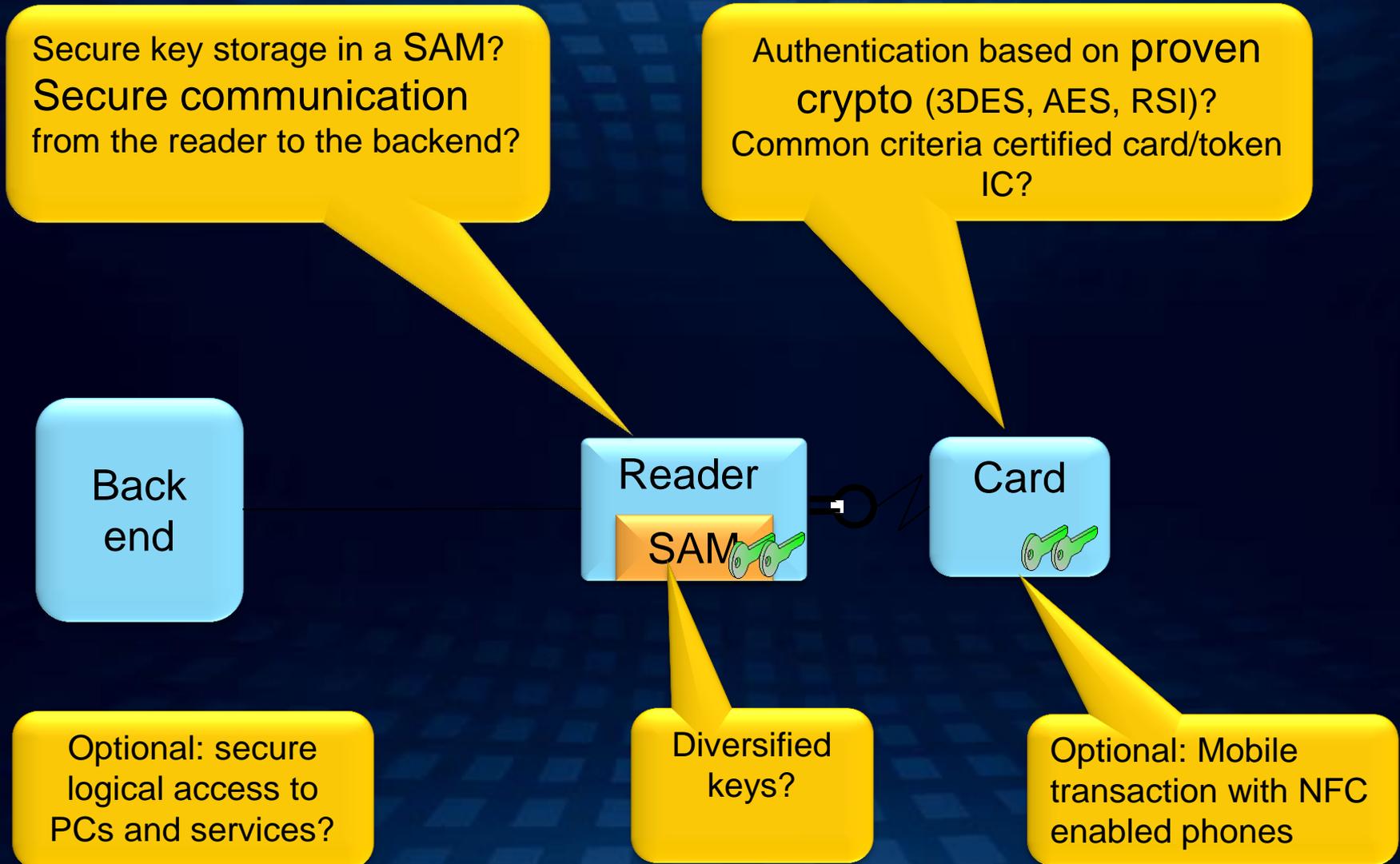
	MIFARE Ultralight MF0 U10 MF0 U11	MIFARE Ultralight C MF0 U20 MF0 U21	MIFARE Ultralight EV1 MF0 UL11 MF0 UL21	MIFARE Classic MF1 S50 MF1 S70	MIFARE Plus MF1 S61 MF1 S71	MIFARE DESFire (EV1) MF3 D21 MF3 D41 MF3 D81
HW Crypto	-	3DES	32 bit PSW	Crypto1	Crypto1, AES	3DES, (AES)
EEPROM	512 Bit	1536 Bit	640, 1312 bit	1 KB, 4 KB	2, Kbyte	2,4,8 Kbyte
Special Features	-	Anti-cloning function	3 counters	-	MIFARE Classic compatible	CC EAL 4+
Certification	-	-	-	-	CC EAL 4+	CC EAL 4+
Contactless Interface	ISO 14443 A (13.56MHz, up to 10cm distance, 106 - 848kBaud)					
Design-in Package	PEGODA (CL RD710)					
Reader IC	Micore I, Micore II or Micore III family					

MIFARE™ – Nearly 2 decades of innovation



SECURITY RECOMENDATIONS

Is your system state of the art?



Design in solutions from NXP



NXP MIFARE
SAM AV2

MIFARE DESFire EV1
CC EAL 4+ certified
Open standard 3DES & AES
Ideal for multi-application

MIFARE Plus Migrating
MIFARE Classic legacy
systems

NXP
access
demo
software

Reader design in kit based
on NXP Reader ICs, SAMs
and μ C



SmartMIX

NXP application notes on
key diversification &
generic data model

NFC phones
MIFARE4Mobile

MIFARE DESFire (EV1)



- › MIFARE DESFire (EV1) is NXP IC solution for contactless multi-application, high speed and secure smart cards. The newly introduced DESFire EV1 is the next generation in our MIFARE DESFire platform.
- › Key Features
 - Common Criteria EAL 4+ certification
 - 2K bytes, 4K bytes and 8K bytes EEPROM with fast programming
 - Flexible file structure for multi applications
 - Choice of open DES/3DES/3KDES/AES crypto algorithm in hardware

**MIFARE DESFire EV1 is
Secure, Scalable and Flexible**

Reference installations & systems

Leading government institutions and corporations rely on NXP technology



SIEMENS



UNIKASSEL
VERSITÄT

THE AMERICAN UNIVERSITY IN CAIRO
الجامعة الأمريكية بالقاهرة

Key system partners promoting MIFARE technology with PRs



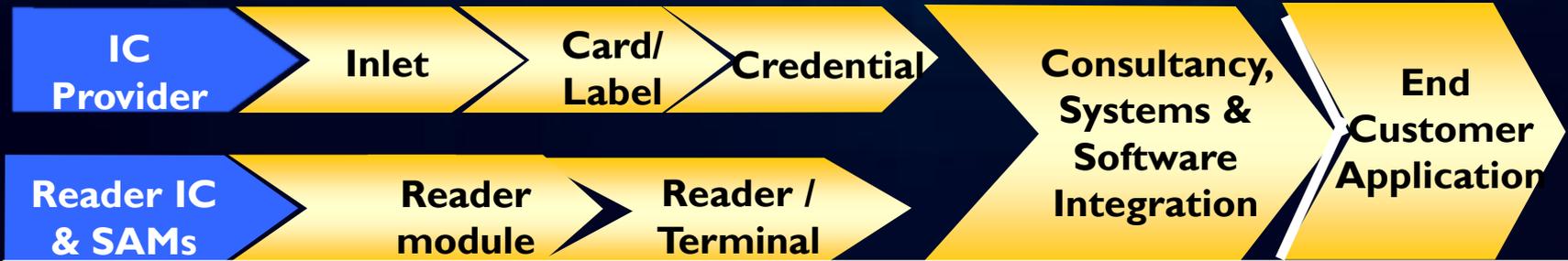
External white papers in sync with NXP's product offering

- ▶ Access Management best practice paper by RWE & srlabs.de
- ▶ BSI Technical Guidelines for the Secure Use of RFID. BSI.de

NXP's Access Management partners worldwide



Giesecke & Devrient
Creating Confidence.



MIFARE.net – the forum

The screenshot shows the MIFARE.net website homepage. At the top, there is a navigation menu with links for Home, About MIFARE, Technology, Products, Applications, Companies, Mcommunity, and Links. A search bar is located on the right side of the header. Below the navigation, the main content area features a large banner for "NEW SMART CARD SOLUTION FOR SCOTLAND" with a video player and a "Read more" link. To the right of the banner is a "LOGIN or SIGN UP" button. Below the banner, there are three columns: "PRODUCTS" (listing MIFARE SmartCard ICs, SmartTicket IC, Reader ICs, SAMs, Mobile, and Flex), "APPLICATIONS" (listing AFC SmartCards, SmartTickets, Access management, Convergence, NFC, and SmartCity), and "COMPANIES" (listing SPECTRA SMART SOLUTIONS P.V., Jimmyu Electronics Co., Ltd., Confidex Inc., Confidex Ltd, and Navkar Industry Pvt Ltd). At the bottom, there are three small promotional boxes: "LEGIC speaks MIFARE", "Go to London Olympics with ASK contactless cards!", and "Check for Companies in your Country".



JOIN THE BIGGEST MIFARE COMMUNITY!!!
1000 companies already registered / iPhone-iPad application

USE CASES

MIFARE DESFire EV1 use cases...

Just some examples

- › Hamburg: 40k students



- › Aachen: 35k students



- › Erlangen: 33k students



- › Kassel: 20k students

UNI KASSEL
VERSITÄT

- › The American University in Cairo



Multiapplications on campus cards

- › Several universities are using campus cards to replace paper tickets for campus events.
 - Alabama : campus card for football games
 - Vilanova: campus card for basketball games
 - Texas: campus card for football games
 - Montana: campus card for football games
- › Backend systems rewards loyal fans
- › Enables schools to be more efficient
- › Very positive feedback from students



French Universities

- › Current campus card in french universities based on MoneoPass
 - Few card makers
 - Royalites involved and expensive solution



- › CNOUS recommending **migration to MIFARE DESFire EV1 for french universities**



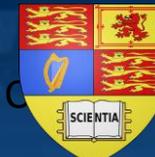
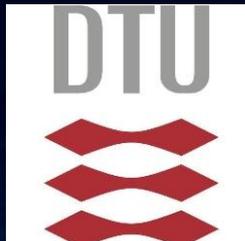
- › Core application is catering and micropayment on campus
 - DESFire EV1 supporting multiapplication for flexible implementations

Smart Certificates – INDIA use case

- › Counterfeited university certificates cause significant irritations in the recruitment processes.
- › Indian Universities are starting to issue certificates with an embedded secure IC
- › The secure IC stores information to allow a secure verification of the certificates authenticity
- › Using MIFARE solutions to protect the certificates



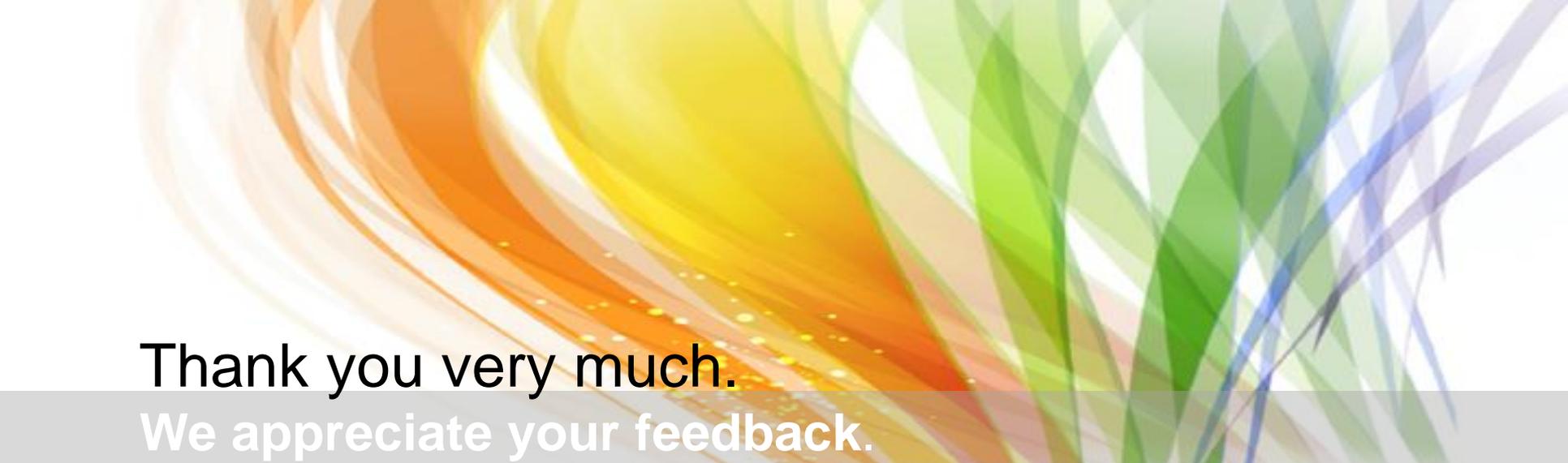
MIFARE Platform universities...



Conclusions

- ▶ MIFARE offers a **strong and reliable platform for campus cards** – already proven on hundreds of **campuses worldwide**.
- ▶ Scalable platform responding to an increasing demand for **privacy and security features** (CC certified card ICs, SAMs in readers). NXP is providing all core components, as well as design in tools for state of the art access management systems.
- ▶ The **MIFARE platform is extendable** for convergence of physical and logical access, combined campus and public transport cards and campus ID on NFC phones





Thank you very much.
We appreciate your feedback.



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