

SMART AND SECURE IDENTITY SERVICES



PROTECTION, FLEXIBILITY AND SIMPLICITY FROM THE LEADER IN IDENTIFICATION



SECURE CONNECTIONS
FOR A SMARTER WORLD

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NXP FOR eGOVERNMENT MEANS
SECURITY, FLEXIBILITY,
SIMPLICITY AND PERFORMANCE



NXP SHAPES THE eGOVERNMENT MARKET

We are becoming a world of cities. The United Nations Department of Economic and Social Affairs predicts that, by 2050, 70 percent of the global population – more than six billion people – will live in urban environments. Like all city dwellers, those billions of people will need efficient, trusted access to interconnected public services. Ideally with a single credential.

At NXP, we're working closely with governments around the world to prepare for this dramatic increase in demand. As a leading provider of identity solutions, we're enabling smart governance with ID programs that are both efficient and secure.

Public agencies around the world already trust NXP for their identification schemes. They partner with us because they know we're the number-one supplier of secure ID solutions for payment, access management, and public transport. We're also the leading choice for secure electronic documents. ABI Research determined, in their Q3/2016

report, NXP to be 46 percent of the eGovernment market. We're known for our ability to shape technology to meet real-world needs, and regularly advise government agencies and industry groups on best-practice solutions for secure identity.

We've successfully delivered more than 250 eGov projects, helping security-conscious governments in

more than 120 countries – including Brazil, China, Germany, India, Indonesia, Nigeria, Russia, the UK, and the US – to issue electronic Passports, ID cards, driver's licenses, vehicle registrations, health and subsidy cards, government access cards, and other documents that require the highest levels of security, performance, and trust.

DELIVERING SMART GOVERNANCE

Our dedication to application excellence means we address what matters most in the development of intelligent government services:

1. REDUCE WASTE, FRAUD, AND ABUSE

Massive deployment of any service brings the need to reduce waste, combat fraud, and minimize abuse. The simplicity, convenience, and security of smartcard-based identification schemes helps increase the efficiency of government programs while reducing administrative overhead.

2. PROTECT CITIZENS FROM CYBER CRIME

Massive data breaches have, become an everyday threat. Protection against cybercrime is more important than ever, and citizens expect their governments to keep private data safe from harm. Resilient government services need to rely on multi-factor authentication and Public Key Infrastructure (PKI) technology to maintain the necessary levels of data privacy.

3. STRENGTHEN DEMOCRACY

Many countries struggle with the political instability that can come from electoral fraud, ineffective voter identification, and lack of voter participation. A secure and convenient voting

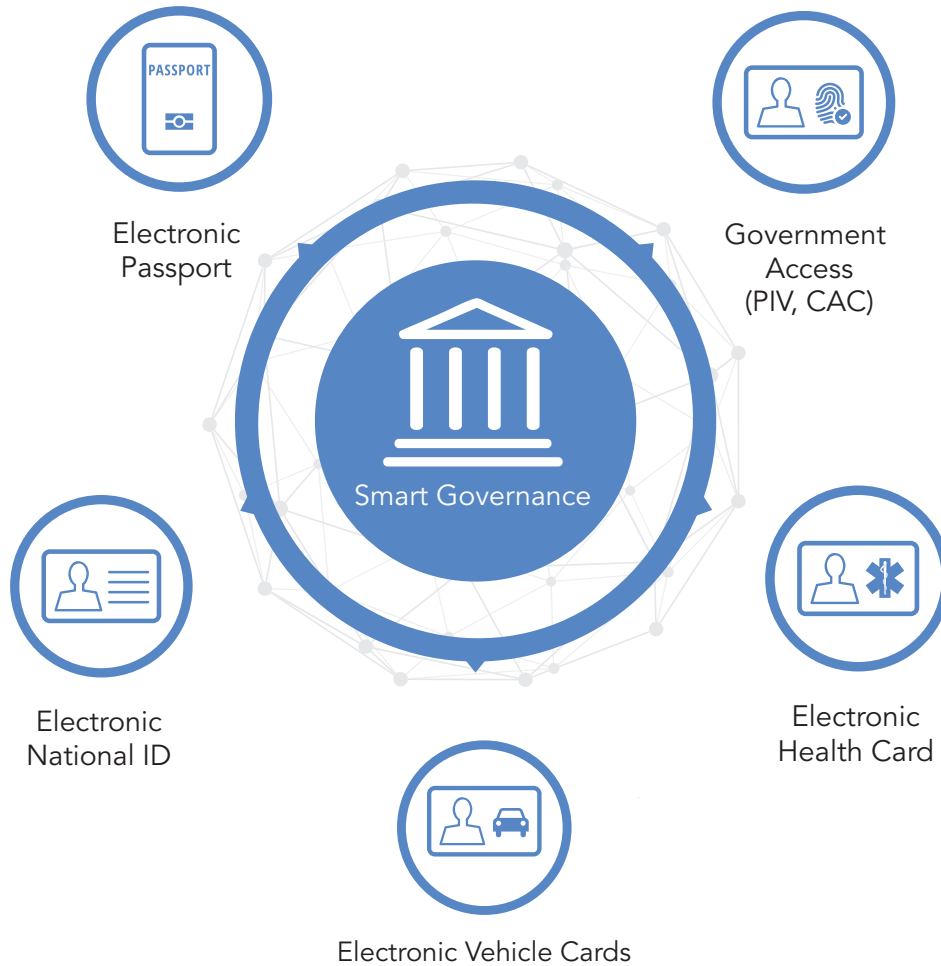
system, with voter registration and authentication based on electronic documents, goes a long way towards enabling reliable elections and stronger democracies.

4. INCREASE CITIZEN SATISFACTION

Delivering services in a non-intrusive way, so that government services are easier to access and simpler to handle, is key for smart governance. Mobility is part of the picture, too, with government programs making it possible for citizens to use their mobile devices to conduct a variety of interactions.

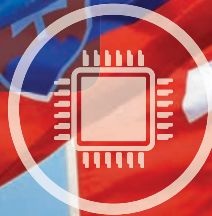
5. EXPAND FINANCIAL AND SOCIAL INCLUSION

The G20, the United Nations, and the World Bank Group have all recognized financial inclusion, which aims to provide universal access to financial products and services, as a priority for global development. Adding payment and banking functions to an eID card is an efficient way of increasing individual participation in finance, and can help citizens contribute to economic growth.





GOVERNMENT AGENCIES IN
MORE THAN 120 COUNTRIES
HAVE CHOSEN NXP



WHY NXP FOR eGOVERNMENT?

COMPLETE SOLUTIONS

- Everything you need, from just one supplier
- Dedicated experts for a smooth implementation
- The broadest portfolio, from start to finish

PROVEN SECURITY

- IntegralSecurity architecture = 100+ security mechanisms
- Highest security ratings (CC EAL 6+)
- Long track record of zero hacks

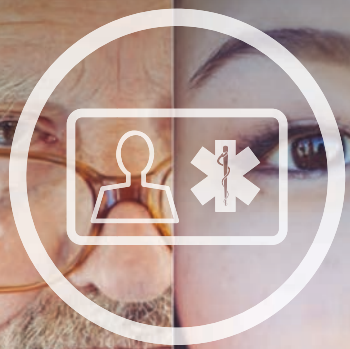
CONTACTLESS PERFORMANCE

- Fast transaction times
- Ultra-low power consumption
- Secure multi-applications

UNRIVALED COMMITMENT

- Unmatched deployment experience
- Highest number of references
- Most security certificates in the industry

**NEARLY 85% OF THE COUNTRIES THAT HAVE AN
ePP PROGRAM QUALIFIED NXP TECHNOLOGY**



MORE THAN HALF OF ALL
ELECTRONIC HEALTH-CARD
PROGRAMS WORLDWIDE
POWERED BY NXP



TECHNOLOGY TO SECURELY NAVIGATE A SMART GOVERNANCE PROGRAM

The best electronic documents combine the security and flexibility needed to safely and conveniently interact with connected government services. Cryptographic algorithms protect data, reduce fraud, and deter theft, while multi-application functionality lets a single document address several services.

The technology that drives these best-in-class electronic documents is familiar to billions of people worldwide, in the form of smartcards. Smartcard technology is

TODAY'S ELECTRONIC DOCUMENTS ARE

- Secure
 - Easy to use
 - Interoperable
 - Cross-functional
 - Cost-effective
-

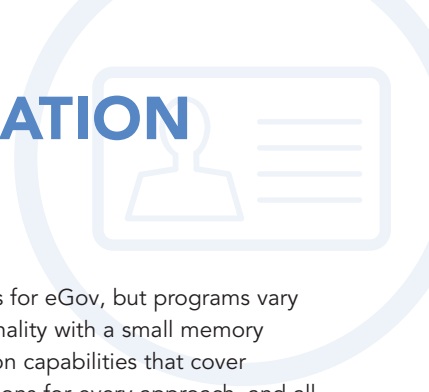
convenient, cost-effective, and durable. In contactless formats, it delivers long lifetimes, with high tolerance to harsh environmental conditions, such as temperature and humidity, and high resistance to aggressive chemicals

At NXP, we use our industry-leading smartcard solutions to support eGov applications of all kinds, and have established lasting partnerships that consistently yield groundbreaking new eGov programs.

A woman with long brown hair, wearing dark sunglasses and a light-colored jacket, is holding a red passport. She is smiling slightly. The background is blurred, showing what appears to be an airport or travel setting. A semi-transparent blue box with white text is overlaid on the left side of the image.

TODAY'S ELECTRONIC
DOCUMENTS ARE **SECURE**
TO USE, INTEROPERABLE AND
CROSS - FUNCTIONAL

NATIONAL ELECTRONIC IDENTIFICATION CARDS (eIDs)



Electronic documents that serve as proof of citizenship represent one of the biggest application classes for eGov, but programs vary widely from country to country. Some of the governments we work with choose cost-optimized functionality with a small memory footprint, just for authentication, while others choose more advanced functionality, with multi-application capabilities that cover everything from voting and social security to public transport and payments. NXP has best-in-class options for every approach, and all are based on the latest regulations and standards, including EU's eIDAS, ECOWAS, Mercosur, and ASEAN.

NXP IN ACTION:

Germany eID

Germany's widely referenced eID program was designed in a joint effort between government agencies and private companies. NXP was part of the initiative from the beginning and still delivers into the project card and reader ICs.

Indonesia eID

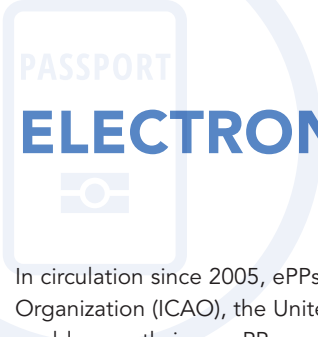
Working closely with the federal government and local vendors, NXP was the sole supplier to this massive rollout, which saw 170 million multi-application IDs, including voting and travel applications, issued within 18 months.

Nigeria eID

Nigeria's groundbreaking eID card combines identification with EMVCo payment functions, in a format developed and supplied solely by NXP. Designed for the long term, the card will continue to add functions over time.

Ecuador eID

Ecuador's eID card program based on NXP's SmartMX with JCOP is the largest program of its kind in Latin America. The card can be used as travel document, perform electronic signature operations and access social welfare services.



PASSPORT

ELECTRONIC PASSPORTS (ePPs)

In circulation since 2005, ePPs follow strict guidelines and standards which are issued by the International Civil Aviation Organization (ICAO), the United Nations agency that oversees international air travel. More than 120 countries around the world currently issue ePPs, and 80 percent of them trust NXP's SmartMX technology to authenticate traveler identities. NXP also provides reader ICs, to ensure fast, accurate transactions at automated border controls and other checkpoints worldwide.

NXP IN ACTION:

Europe

NXP supports SAC-based ePP programs in many European countries, including France, Germany, the Netherlands, Norway, Russia, Spain, and the United Kingdom. Global interoperability and high security are the hallmarks of these programs.

Africa

Travel within the African continent is getting easier, thanks to a standardized ePassport program that follows regulations issued by the Economic Community Of West African States (ECOWAS). Burundi, Kenya, Nigeria, Sierra Leone, and Tanzania are among the first to adopt the program, and all are supported by NXP solutions.

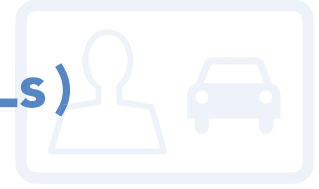
Asia & Greater China

Increased security and added convenience are the top reasons why so many of the governments in this region, including China, Hong Kong, India, Indonesia, Malaysia, the Philippines, and Singapore have chosen NXP technology for their eGov programs. Our technology secures the personal data in all their electronic documents, including passports.

Latin America

The need for high reliability, reduced identity fraud, and faster border crossings has driven a number of countries in Latin America, including Argentina, Brazil, Colombia, Ecuador, and Peru, to partner with NXP for secure electronic passports.

ELECTRONIC DRIVER'S LICENSES (eDLs)



Smartcard-based driving credentials are easier to update, can perform multiple functions, and reduce the risk of counterfeit. They simplify the administration process while delivering a valuable return on investment. They can communicate with readers, carried by highway patrol, and can be configured to act as an extra car key, to prevent an unlicensed driver from starting the car, or can connect to tachographs and insurance-based apps that track driving habits. Loaded onto a mobile phone, the eDL gives drivers a convenient way to carry the credentials, and enables new interactions with driving authorities.

NXP IN ACTION:

China

As the number of drivers in China is growing fast, the need for a secure driving license solutions is a major element to ensure a stable identification system. NXP supported many cities in China to establish a secure driving license program based on international standards.

US

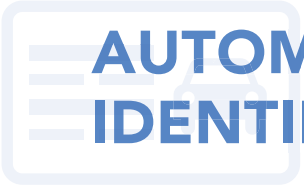
US citizens can update their electronic driver licenses over the Internet for different personal information and even use it for voter registration. The driver's license can also be used as a border crossing credential into Canada, Mexico or the Caribbean islands. A few states have already begun the journey toward offering mobile driver's license next to smartcards.

India

India is following the approach of becoming a Digital India. NXP supported several Indian states issuing an electronic driver's license to enable a secure identity protection of their citizens, a more convenient road security, and an efficient administration process.

Brazil

Brazil's electronic driving license *Carteira Nacional de Habilitação* helps to increase security and to prevent document fraud. The current smartcard based on NXP's secure microcontroller carries the driver's photograph, the number of his/her most important documents and can be used as an ID card.



AUTOMATIC VEHICLE IDENTIFICATION (AVI)

Vehicle registration, in the form of windshield-mounted stickers or metal license plates, are another type of government-issued document. Equipping vehicle registrations with dual-frequency tags, which include secure versions of long- and short-range wireless connectivity, enables more effective collection of taxes, fines, and tolls. Also, the vehicle becomes an authentic credential for loyalty, access, and micro-payment, so you can buy gas, pay for parking, get a carwash, or pick up a drive-thru meal, all without reaching for your wallet or phone. NXP has active AVI projects in more than 10 countries.

NXP IN ACTION:

Intelligent Traffic Light in Hamburg, Germany

This pilot project optimizes the flow of truck traffic in one of the world's busiest commercial harbors. The intersection can also warn drivers of vulnerable road users, issuing alerts when schoolchildren, wearing tagged backpacks, are crossing the street.

Air Quality in Beijing, China

In Beijing, on days when air pollution is particularly high, only vehicles with a "GreenTag" are allowed to enter certain city zones. The program reduces emissions, encourages use of public transport, and can be used to reduce traffic congestion during major events.

Electronic Vehicle Registration in India

A fully automatic border checkpoint-control system, involving 22 locations, reduces processing time, so traffic moves faster. Random checks have been replaced by 100 percent checking, and official inspections are more thorough because inspectors have more time.

Electronic Toll Collection in Turkey

2,000 km of Turkey's highways, including 387 lanes in 94 locations, together with several million vehicles, are equipped with passive UHF RFID. Automatic fee collection ensures the free flow of traffic while accurately charging vehicle owners for use of highways.

A BREAKTHROUGH FOR UHF RFID & AVI

NXP's UCODE DNA combines long read range and very fast performance with high security. Vehicles can be identified at highway speeds, from a distance of up to 15 meters, and crypto authentication for dynamic security means each transmission is different from the one before. Thousands of vehicles can be securely identified, so traffic keeps moving, while accuracy and privacy are assured.





ELECTRONIC HEALTH CARDS (eHCs)

Used by patients as proof of eligibility for services or benefits, these cards can also be used by caregivers to protect access to patient data. The card can be loaded with an encrypted key that authorizes access to a remote server or, when equipped with a larger memory, can securely store patient information, such as allergies, medications, prescription refills, or emergency contacts. The result is faster treatment with the right medicines, and less paperwork for pharmacies and insurance companies. Of the 20 countries that have implemented an eHC or subsidy program, 11 of them qualified NXP, including France, Germany, India and Romania.

NXP IN ACTION:

France SESAM-Vitale

NXP provides smartcard ICs for the French Health Card called SESAM-Vitale. The card allows holders to have secure access to their personal medical files electronically. The SESAM-Vitale Health Card contains a SmartMX secure microcontroller.

Germany eGK

The Health Card roll-out is a major initiative by the German government supported by NXP secure microcontroller technology. The "elektronische Gesundheitskarte," aims to enhance the public health system in Germany by improving the availability and accessibility of patient data. NXP's secure SmartMX technology will ensure that access to this data is conducted securely, providing the best possible protection of patient data and privacy.

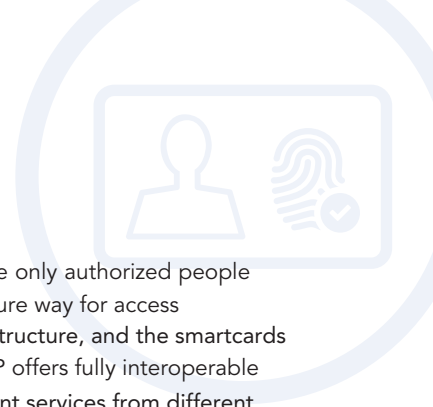
Philippines Unified Multipurpose Identity (UMID)

When the four biggest health-insurance providers in the Philippines wanted to make it easier for their members to access services, they turned to NXP. The resulting UMID chip-based card is a best-in-class product with the flexibility to add more features in future.

Russia Federal Social Card

The technology facilitated dual interface (contact-based and contactless), MIFARE transit application, Visa-approved retail payments, storage of social security and medical information, as well as the flexibility to add or delete applications after the card had been issued.

GOVERNMENT ACCESS



Electronic IDs for employees and contract personnel in local, regional, and national government ensure only authorized people access the workplace or log on to government systems. Contactless smartcards offer a convenient, secure way for access buildings or logical access to PCs. Biometrics can be added to further increase security of critical infrastructure, and the smartcards can be configured to support automated attendance records or locate personnel in an emergency. NXP offers fully interoperable solutions for cards and readers designed for easy incorporation into non-existing or existing government services from different agencies and ministries. Further, NXP's solutions support secure co-existence of applications on one credential - enabling auxiliary applications like micro-payment or integration into public transport scheme. Complementing applications enhance the value of electronic ID for the employee leading to higher efficiency.

NXP IN ACTION:

US PIV Program

Several federal agencies in the United States, including the Department of Commerce and the Department of Veteran Affairs, use NXP-driven solutions for their Personal Identification Verification (PIV) programs.

European Parliament / European Commission

NXP is delivering a smartcard solution to the European Parliament and Commission. The solution enables card holders to physically access secured facilities. The smartcard is based on NXP's MIFARE DESFire for advanced cryptography and secure user authentication.

Rijkspas – Dutch governmental card

The Rijkspas is a smartcard based on NXP's MIFARE DESFire carried by Dutch government officials. It enables the cardholder to physically access secured buildings. Plus, the smartcard is also a log on solution and therefore allows logical access to secured computers and networks.

NASA

The access management enabling Smartcard for NASA facilities is supported by secure NXP IC solutions. The Smartcard allows physical access to official NASA buildings. It is secured by NXP's MIFARE DESFire.



MORE THAN **6 BILLION**
SmartMX ICs HAVE BEEN SHIPPED



NAME

ADDRESS

PERSONAL ID

BUSINESS ADDRESS



THE BROADEST eGOVERNMENT PORTFOLIO

As the world's leading supplier of ID solutions, NXP delivers all the ingredients for a quick, cost-effective deployment, from secure microcontrollers and operating systems to pre-configured applications and full personalization services.

Secure Hardware: SmartMX

The central component of any eGov solution is the secure microcontroller inside the electronic document. NXP's secure SmartMX brand, now in its fifth generation, is the world's leading choice for eGov and payment applications. It provides advanced attack resistance and superior transaction performance in contactless, contact, and dual-interface formats.

Supported by powerful cryptographic coprocessors and

an ultra-low-power design, the secure SmartMX architecture support advanced multi-application functionality, offers quick personalization time, and is designed to simplify development while reducing the overall cost of deployment. NXP provides all the cryptographic algorithms required by any eGov program, including symmetric triple-DES and/or AES cryptography, hash algorithms like SHA-1/SHA-2, asymmetric RSA, or elliptic curve cryptography with support for the most advanced key lengths.

The SmartMX brand has been verified by global certification institutions to comply with the highest standards of ICAO and ISO/IEC, and meets the strict requirements of the U.S. department of defense and the German federal government in terms of quality, reliability, and security. Also, the latest generation SmartMX3 has earned Common Criteria Evaluation Assurance Level (CC EAL) 6+ certification, the level deemed necessary to protect high-value assets against sophisticated attacks.

SmartMX AND THE INTEGRALSECURITY ARCHITECTURE

The SmartMX products make use of NXP's unique IntegralSecurity architecture, which includes more than 100 security mechanisms. The architecture defends against attacks and deters fraudsters at every point, from the factory to the eID holder's hand. The result is complete life-cycle protection for the circuit and its associated eGov document.

HIGHLIGHTS OF THE INTEGRALSECURITY ARCHITECTURE

Feature	What it Means for eGovernment
Protected IP	Seven metal layers produce a highly protective mesh of active and dynamic multi-threaded shielding
Tamper Resistance	Secure RAM and Stealth-NV-Memory provide advanced detection to protect against sophisticated, combined attack scenarios
Attack Resistance	SecureFetch defends light and laser attacks while GlueLogic and active shielding technology are providing highest level of attack resilience which is unique in the market
Forensic Security	NXP's unique Physical Unclonable Function (PUF) uses the unique atomic structure of the semiconductor crystal to give each IC its own electronic "fingerprint"
Power Efficiency	The extremely low-power hardened FAME 2 crypto coprocessor prevents side-channel attacks, where power-consumption monitoring can uncover secrets
Crypto Protection	Using an approach considered to be the most advanced in the industry, the FAME 2 crypto coprocessor is protected during both the on and off states
Application Firewalls	Identity and payment functions can safely co-exist because information associated with each multi-application function is kept separate and protected from crossover access

TAILORED SOFTWARE: JCOP OS

JCOP is NXP's own operating system for the Java Card and GlobalPlatform compliant format. Originally developed by IBM, and bundled with our SmartMX controllers since 2007, JCOP has shipped with over 1 billion devices and now powers applications in over 80 countries.

JCOP is secure, fast, and flexible. Payment transaction times, which clock in at less than 290 ms per transaction, satisfy MasterCard's latest performance requirements, and put JCOP in a class of its own for dual-interface applications.

JCOP CAN PROCESS A PAYMENT IN **UNDER 290ms**

The most recent version, JCOP 3.x, is optimized for use with the SmartMX2 architecture, offers native support for NFC contactless formats, and can be used with flash-based persistent memory. It conforms to the GlobalPlatform 2.2.1 card specification, and has passed EMV and Common Criteria certification.

With JCOP, developers move quickly to create APIs and applets, configure standard operation, and create custom functionality. There are specific applets for eGov applications, and special features that make it easier to pass compliance programs, such as ICAO. The OS is included as a standard part of our dual-interface and contact solutions, or can be used on its own, with custom packaging.



STREAMLINED SERVICES: CREDENTIALING & PERSONALIZATION

NXP is dedicated to being an “all-in-one” solution provider, and offer complete personalization and credentialing services so you can work with one partner, from start to finish. That means faster deployment times at a lower cost.

Personalization Service

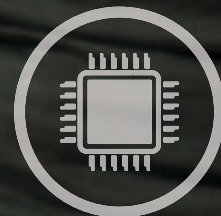
Personalization turns a generic smartcard into a unique electronic document, ready for use with your application. Our standards-based personalization services include loading the entire application code, all the user data, and every cryptographic key, so the document is fully secured and ready to deploy. Using our combination of SmartMX hardware and the JCOP OS saves time with this step, since both offer pre-personalization features that can be configured in advance.

Credentialing Service

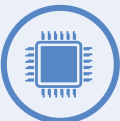
Trusted Identity Management Service makes it easier to manage your finished product, because it gives you a way to simply and securely handle all the credentials associated with your deployment. Supported by the advanced cryptography features on the smartcards themselves, our credentialing service ensures that security certificates are properly assigned, encoded, stored, and maintained, while keeping the highest standards for privacy and protection.



MORE THAN 15 COUNTRIES
NOW OFFER MOBILE ID
SOLUTIONS



NXP SECURE ID-PRODUCT AND SERVICE OFFERING

	PERSONALIZATION SERVICES	• OS Initialization • Applet- and data loading • Applet CC & FIPS cert. support	
	INLAY	• eCover • Datapage • Prelaminate	up to CC EAL 5+
	APPLICATIONS	• ICAO • ePKI • eHealth • eVehicle • Payment • MIFARE	up to CC EAL 4+
	SECURE IC OS	• Javacard OS - JCOP	up to CC EAL 5+
	SECURE IC'S	• SmartMX family	up to CC EAL 6+

TRENDS TO WATCH

Our work with government agencies around the world gives us an inside view to the future of smart governance programs. Two of the most promising near-term trends we're tracking are mobile ID and multi-application services.

MOBILE ID

The near-universal presence of mobile phones creates a logical extension of eGov formats. While people might forget to carry an ID card, they're unlikely to go anywhere without their phone.

The arrival of Near Field Communication (NFC) has increased momentum for mobile ID applications, because so many people have phones with NFC capability. ABI Research estimates there are more than 945 million smartphones and enhanced phones equipped with NFC today,

and that number is expected to nearly double in the next five years, growing to almost 1.7 billion by 2021.

NFC + eSE = SECURE MOBILITY

When NFC is combined with an embedded secure element (eSE), in what's known as „Secure NFC“, mobile devices can provide the advanced, cryptography-based security needed for eGov applications. Secure NFC can be trusted to ensure privacy, prevent fraud, and deter identity theft. Secure NFC surpasses the protection levels required for

electronic passports, and can keep credentials current with support for over-the-air (OTA) updates. Phones that use Secure NFC can also serve as readers, for a cost-effective addition to the existing infrastructure and in-place inspection systems.

NXP helped pioneer NFC (we co-invented the technology more than a decade ago), and has led the way in payment applications based on Secure NFC. Also, NXP's SmartMX microcontrollers are the number-one solution for high-security banking and access applications.

MULTI-APPLICATION SERVICES

Another growing trend in eGov is convergence, of multi-applications, which is the use of a single smartcard or mobile application to access multiple government services. The setup makes it easier to interact with public administrations as a whole, and as a result can improve customer satisfaction and increase citizen engagement.

Healthcare can be combined with social security or welfare programs, for example, or transport cards can be paired with payment services, for things like entry into parking garages, bicycle rentals, and so on. New applications can be added over time, for a long-term goal of maximizing convenience by supporting as many services as possible on one smartcard.

Security for Multi-Application Environments

The need to keep private data confidential and inaccessible becomes absolutely essential with a multi-application setup. Hackers already apply sophisticated attacks to steal passwords and capture log-in credentials for programs that provides access to a single government program—create a single point of access to multiple services, and you’ve only made the program more attractive to criminals, since gaining access can provide richer rewards.

Multi-factor authentication provides more effective protection than passwords alone, which is key for secure multi-application services. The addition of a second or third factor for authentication, beyond a simple password, strengthens the system and makes it less vulnerable and less attractive to attackers.

The GlobalPlatform initiative helps to ensure security for multi-application services, too, by defining how Secure NFC supports mobility. The initiative has defined supplementary security domains (SSDs) that allocate the eSE to several secure applications. Separate keys are used to manage each application domain, so phones equipped with Secure NFC can support any number of government applications, from basic identification to building access, transit access, payment cards, and more.

Most powerful multi-application platform

To serve a range of applications in eGovernment, SmartMX supports open-platform solutions like JAVA, its contact interface meets the international standard ISO/IEC 7816 and its contactless interface complies with ISO/IEC 14443. In addition, SmartMX with MIFARE implementations offers compatibility with a wide variety of additional applications.

TAKE THE NEXT STEP

Get in touch to find out more about NXP's seamless approach to eGov applications. Email us at support@nxp.com or contact your local sales office.

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