PROJECT RESULTS

CA206 | Advanced e-Passport makes border control faster, easier and more secure and also offers travel services
[NewP@ss]

Deploying microelectronics and embedded software, the NewP@ss project delivered advanced secure platforms for third and fourth generation e-Passports, currently under discussion at the International Civil Aviation Organization (ICAO). Once approved, the new e-Passport could be deployed for European and international travel, and to host a variety of travel-related e-applications – from electronic visas and boarding passes, to airline services.

NewP@ss focuses on developing advanced and secure platforms capable of handling new generation e-Passports for European and international travel. The third generation e-Passports were expected to be put in place in Europe by the beginning of 2015, and fourth generation ones in 2018. These new platforms enhance security and features traditionally connected with a passport, and can host dedicated e-services associated with travel. In fact, several other related e-documents, including the residence permit, are currently being finalised. And other electronic applications including e-Identity, Register Traveler Program, electronic voting and electronic driving licence are under consideration

This project is also about addressing interoperability, as well as, contributing proactively to international standards.

High performance and tight security were top priority

The NewP@ss project targeted the development of advanced microelectronics and embedded software secure platforms for the future generations of e-Passports and related government and private-sector e-services. To achieve project objectives, NewP@ss also made use of results and deliverables from previous CATRENE projects, such as MEDEA+, Onom@Topic and BioP@ss.

Project activities were quite extensive and included developing:

— Hardware and software technologies to support next-generation e-Passports, and in particular, the new logical data structures (LDS2) under discussion at the International Civil Aviation Organization (ICAO). This will enable a fundamental conceptual shift on passport usage, and also make the e-Passport a true multi-application device;

— Technology elements to meet regulatory performance and functionality standards.

These include new cryptographic protocols (like SAC, EAC v2.1); high-speed contactless interfaces (like VHDR/VHBR); and efficient biometry;

— Complete proofs-of-concept for new e-Passport implementation, resulting in a combination of advanced secure microcontrollers; advanced embedded software platforms based on small footprint multithread OS; and secure compact fixed or mobile readers. Validation was done through use cases deploying typical e-government and private organisation scenarios. Some of these use cases required development/ validation of security mechanisms for the proper handling of security credentials (such as certificates and PKI schemes);

— Security and privacy concepts needed to ensure a lifespan of five to 10 years for e-Passport platforms, as well as, the proper level of isolation between applications;

— Functional test suites and reference implementations suitable for further interoperability testing.

Project results are very encouraging. Deliverables include advanced secure e-Passport platforms embedded with state-of-the-art, near-field communication capabilities, which are 16 times faster than the generation of passport currently used. Microcontrollers provide the necessary computing power and memory to achieve high computing performance as well. Associated readers with impressive performance and interoperability requirements are also available. And with the increase in fraudulent activity, there was a special focus on security and privacy aspects, resulting in the implementation of new, very effective cryptography protocols (like SAC and EACv2.1). Crucially, the NewP@ss platforms have reached the highest level of security required for border-control operations. The first 3G ePassports are now available and will be marketed in 2016; and the 4G version from 2018.

Promoting European expertise, standards and industry

Information sharing within the NewP@ss consortium was very effective: more than 50 reports with project results were shared internally and new collaborations have been established. Project partners also shared project knowledge and scientific results in academic journals, and through major international conferences. In addition, the consortium contributed to various special-interest groups focusing on standards and applications.

NewP@ss goals and deliverables mesh nicely with the European Union's own Digital Agenda that sets out the European Commission's strategy for addressing the main challenges and developments in the information society and media sectors up to 2020. This initiative aims at improving efficiency, modernising administration, reducing bureaucracy and facilitating citizens in communicating with the various administrative authorities. Once citizens have secure national identification cards and e-Passports, they will be able to gain easy access to services in an expanded e-administration.

In the travel world, the European e-Passport scheme is considered a showcase and reference. This means, for example, the new SAC protocol could be supported globally through this project, thus promoting European standards and industry in the process.

Business opportunities with e-government services

Identity management (the mechanism for identifying a person) is currently conducted mostly by paper. Electronic identity will complement, or perhaps even replace, paper-based identification with electronic means, which offers huge advantages, such as information access anytime, anywhere. A good example of where identity management can be deployed is in accessing public services, something every EU citizen is entitled to. Importantly, this should be simple, secure and accessible anywhere and anytime within any member state.

However, implementation raises several technological and organisational issues. These include security, privacy and data protection, together with interoperability and the amount of information an ID card should contain, as well as the means and methods of authentication. NewP@ss makes this possible by providing some of the key enabling technologies and components, together with the necessary expertise and experience. It in fact offers a sound basis for developing new business models around e-government services.

Markets to match

Applications targeted by the Newp@ss project share stringent requirements in terms of security and interoperability at European and international levels. That is why this project strengthens the competitiveness of the European industry for e-Passport and other spin-off applications and services that use secure personal devices. Furthermore, these applications have large economic, societal and technical impact and will represent a huge part of the total e-Passport market by 2015-2020. In fact, this market is vast and expanding. Already more than 30 countries adopted the first version of the ICAO e-Passport by mid-2007, and the EU adopted SAC-secured biometry at the end of 2014. Adoption in Europe of third and fourth generation e-Passports is expected to create a market for more than 200m units.

And notably, Secure ID News predicted in 2010 that the e-Passport market (made up of hardware, software, and services) would reach sustainable, annual revenues of US$7 billion by the end of 2014, with a compound annual growth rate of 31.5% in 2009-2014. In addition, the Asian market is expected to experience the most significant market-share growth, increasing from 25% to nearly 46% of annual market revenues with an annual compound annual growth rate of nearly 50%.