Chapter III

Smart Card Applications and Systems: Market Trend and Impact on Other Technological Developments

Gerald Maradan, STMicroelectronics, France
Pierre Cotte, STMicroelectronics, France
Thierry Fornas, STMicroelectronics, France

ABSTRACT

Securing data is becoming of the utmost strategic importance in today’s digital environment. Open wide networks such as the Internet and interdependencies of modern systems have reshaped security requirements of smart card platforms. Smart card chips have been designed for 20 years to protect data and resist against attacks. Design mechanisms, cryptography, software implementation and certification process have all been introduced to provide efficient tamper resistant techniques against piracy. These techniques are re-used by a semiconductor industry demanding even more security. At the same time, smart card industry tries to address this demand and modify its positioning. This global convergence slightly impact new modern integrated systems.
INTRODUCTION

Securing data is becoming of the utmost strategic importance in today’s digital environment. Open wide networks such as the Internet and interdependencies of modern systems have reshaped security requirements of smart card platforms.

In the 1980s, the first secure platforms were introduced by semiconductor industry to address smart card market needs. A smart card is a plastic card, embedding a silicon IC (Integrated Circuit). Today, smart cards are being used in a wide range of applications, from SIM (Subscriber Identity Module) cards for GSM (Global System for Mobile Communication), pre-paid memory cards for telephony and TV applications to transportation, communication, banking, health and identity cards. Since the late 1990s, GSM has been the market driver of smart card industry.

All these applications aim at protecting sensitive data. Therefore, security has shaped both hardware architecture and embedded software of smart cards. Beyond the technical features, a standard security evaluation methodology has been introduced, the Common Criteria (CC), released in 1996 in order to guarantee that the whole development process follows methodology rules. However, the environment is changing and the smart card market is at a watershed:

- Firstly, the communication revolution occurred: Internet, laptop computers and mobile phones led to the advent of the communication world. Thirty years ago, Marshall McLuhan made up the theory of “the Global Village” to describe his feeling that the world was getting everyday more interconnected and thus smaller and smaller (McLuhan, 1968). Indeed, today, anywhere in the world, people are able to communicate, to handle and exchange data. In this environment, securing data and communication becomes critical. Traditional software solutions to protect data turn out to be too weak to handle sensitive data (Pescatore, 2002). Technology providers propose alternatives and implement smart card techniques in modern platforms.
- Secondly, the digital convergence is on the track. Data transfers are moving from analog to numeric forms and digital home networks (DHN) are looming, inter-connecting into a network all devices in the house (set top boxes, televisions, DVD players, home servers, game consoles and computers) linked together through digital interfaces (USB – Universal Serial Bus, DVI – Digital Video Interface …). The digital convergence will keep on. As a consequence, valuable content is now fully in a digital form and can be reproduced and redistributed wherever without any modification of its quality. Many industries, like music or movie ones, are at risk. Technology providers, coupled with standardization bodies try to find solutions for
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