



WHITE PAPER

BACKGROUND INFORMATION

ON THE

M - COMMERCE EXTENSION

SPECIFICATION

5C:
Hitachi, Ltd.
Ingentix GmbH & Co.KG / Ltd.
Matsushita Electric Industrial Co., Ltd.
SanDisk Corporation
Toshiba Corporation

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INTRODUCTION

Based on the rapid expansion and acceptance of broadband home and small business networks such as Cable and ADSL in the U.S., Europe and Japan, the emergence of third-generation mobile phones is signaling an era of wirelessly connected network access which will be available nearly anywhere and at anytime. The proliferation of continuously connected high-speed Internet access will enable a more productive and efficient life-style for business users and general consumers, and will stimulate demand for mobile commerce services such as the purchase of movie or airplane tickets, food, or Audio/Visual content such as music or movies. All of these emerging mobile services require high levels of security to protect not only the transmission of financial account and PIN codes but also the data that is ultimately downloaded and stored. Advanced SmartPhones and convergence PDAs will serve as the mobile terminals that will generate the demand for these services.

Until now, it has been common to enable secure commerce transactions via a tamper-resistant chip card IC typically packaged in a credit card-size SmartCard. In typical storefront purchases, this has been adequate and convenient—not only for the users but also for the businesses where the secure cash register or terminal resides. However, with the emerging demand for similar mobile commerce transactions originating wirelessly from a mobile terminal, a new solution that is not only physically scaled to match the device but is also capable of much larger data capacity will be required. Fortunately, two standards that have been in the making for several years provide a great base from which to build a new generation of highly secure, high capacity M-Commerce cards: the SIM (Subscriber Identification Module) used in GSM mobile phones and small form factor memory cards such as SD or MultiMediaCard (MMC).

To this end, Hitachi, Ingentix, Matsushita, SanDisk, Toshiba (the 5C companies) have defined a new standard called the M-Commerce extension specification (hereinafter Mc-EX) that can be easily adapted to any small memory card that has been enabled with the same IC card technology currently in used in SIM and SmartCards today. One of the primary benefits of combining the security function with the large capacity memory function is that a user can easily move their eCommerce capability around with them to various mobile terminals and not be tied to the SIM module in a particular device. Likewise, the large amounts of content that will be purchased and downloaded will also move with the user. This transportability of M-Commerce capability and mass storage capability is uniquely suited to the coming wave of pervasive broadband wireless devices and the new lifestyles they enable.

ARCHITECTURAL OVERVIEW

The 5C companies have defined the Mc-EX core specification as well as the initial Mc-EX interface specifications for the SD and MMC card standards. Future interface specifications to any other cards can be added based on market requirements.

The core specification provides mobile terminal manufacturers with an open integration platform for security that can be easily adopted to existing memory card standards. The 5C companies will license the core specifications and interface specification to any and all interested parties outside the 5C.

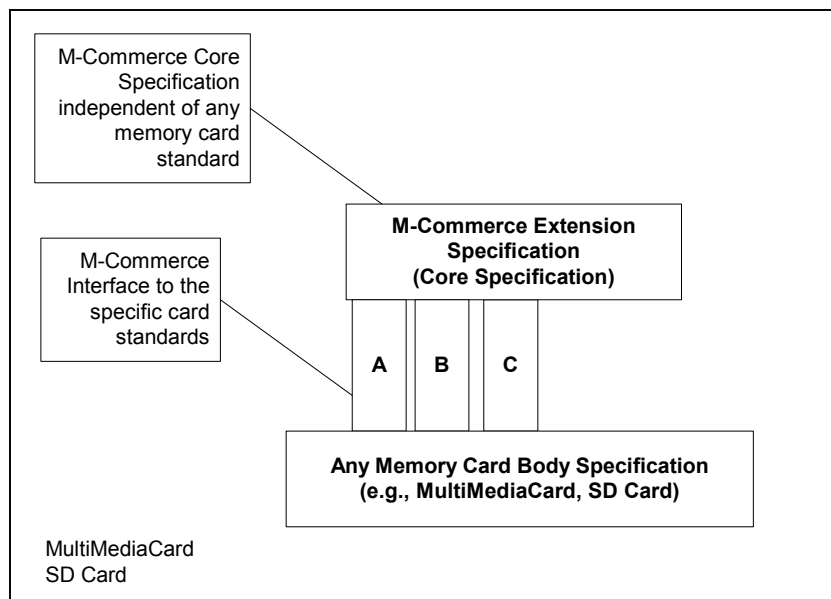
The Mc-EX specifications contains 2 parts:

- Part 1 includes the basic commands set as well as supported secure features.
- Part 2 is targeted to define security applications that use the basic core commands. The first application that is specified is full WIM [1][2] capability as an optional application ideally suited for mobile terminals.

The M-Commerce Core Specification is specified and the addendum approved by 5C¹. Additional functions, features and applications may be added in the future by the 5C.

Figure 1 shows the summary of the architectural overview.

Figure 1. Architectural Overview Summary



¹ 5C: Hitachi, Ingentix, Matsushita Electric, SanDisk Corp., and Toshiba.

FEATURES OF THE MC-EX SPECIFICATION

A host that uses the security features of the Mc-EX standard will switch into Secure mode after the normal card initialization is completed. This is designed to allow the easy integration of the Mc-EX standard into the existing memory card standards. The switching mechanism is defined in the I/F extension physical layer specification and in each card interface specification. Once the card is in Mc-EX mode, the Read and Write Secure Commands are available.

► security token transport commands

The Read and Write Secure Commands that transport the security token on the Data line between a host and a memory card are defined in the Mc-EX core specification. The structure format that encapsulates the security token is specified in compliance with [ISO7816-4] [5] standard APDU.

► mc-Ex register

The CSI (Configuration and Status Information) register is defined and contains Status, Configuration and Properties of the card when in the Mc-EX mode. The CSI register can be read using the SEND CSI Command.

MC-EX APPLICATION SEGMENTS: FUTURE OUTLOOK

Today memory cards have become a bridge media or “personal network” between various digital devices. Likewise, the smart card has become the de facto media for secure public network access in various commerce systems.

The Mc-EX enables the linking of bridge media like memory cards with the secure media like SmartCards for use in mobile commerce transaction within both Private and Public mobile networks.

There are three focused segments that are addressed by the Mc-EX standard:

- Mobile Commerce
- Personal entertainment
- Mobile Workforce

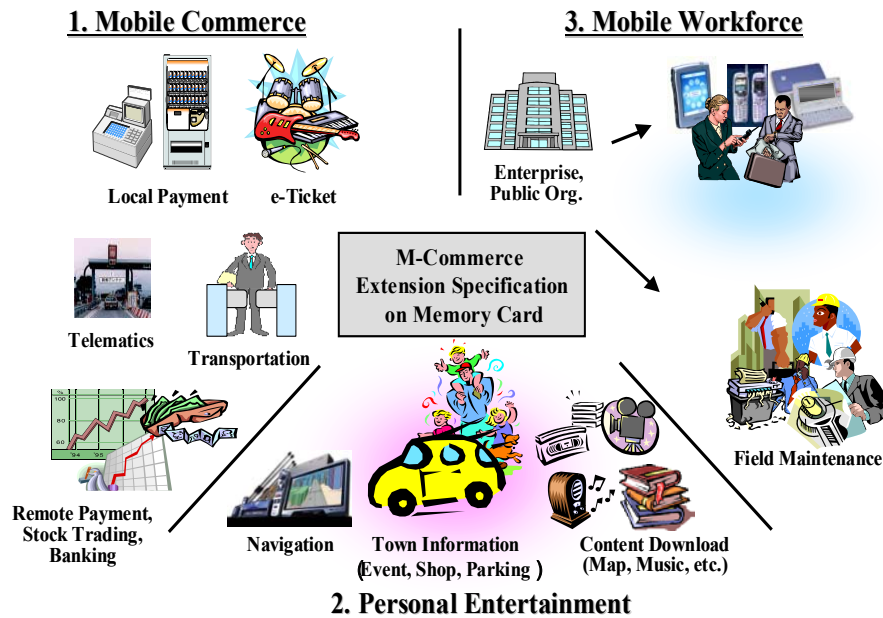
The Mobile Commerce application allows for personal payment transactions like e-ticket purchase, local merchant payments, stock trading, and eventually telematics and transportation usage in the future.

The Personal entertainment application addresses distributed and/or downloaded music, video and eventually navigation content that is copyright protected. In some regions of the world, this type of systems is already in use to a limited degree.

The Mobile work force application connects outside sales people to both internal company and external public organizations through a secure network. This application is an essential part of a comprehensive sales force automation (SFA) implementation.

Figure 2 below shows the abstract of the target segments.

Figure 2. Target Segments



CONCLUSION

In summary, the Mc-EX standard, developed by the 5C companies, provides a timely solution for a new class of wirelessly connected mobile devices that demand secure commerce transaction capability. The blending of existing standards for security with existing standards for stamp-size, high-capacity storage cards allows mobile terminal designers to quickly provide solutions to a burgeoning class of sophisticated mobile users without the need to invent new standards to solve the problem. Collaboration on the Mc-EX standard by the leading providers of stamp-size cards and security ICs, will assure a smooth and abundant supply of this desired technology in the near future.

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