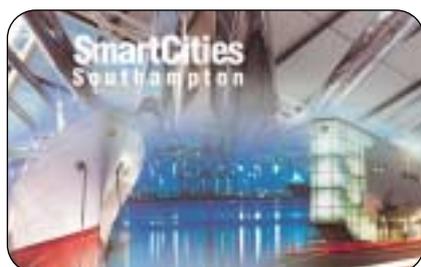


Subscribers will receive "Motorola's tick.et" card free with this issue of Smart Card News.



Southampton SmartCities Pilot: European Model?

The City of Southampton (population 215,000) on the south coast of the UK has been selected to pilot the SmartCities Smart Card co-funded by the European Commission and nine partners. The project, which will run until November 2002, will use Smart Cards for transportation, entertainment, education and other services, and will provide a model for other European cities.

The new SmartCities card will allow citizens to use and pay for leisure, library and transport services in the city without using cash. It will also be used to access services and for payments at Southampton University. Use of the card could be extended to other services in the future.

Continued on page 83



CardTech/SecurTech, Miami



May 2000



News

083 - 096

*Gemplus Buys ODS Landis & Gyr
Smart Medical Card for Jordan
Motorola AFC Systems for China
Breakaway groups new company
Italian Healthcare Card
PubliCARD Forms Infeiner
CardTech/SecurTech Show
New Products from Bull
Cubic Smart Card Fare Solutions
GSA joins GlobalPlatform
ACG and Utimaco Set up Omnikey
TSA Acquires Chipper Technology
Smart Card Migration in Brazil
Keyware Using Java Card Platform*

Smart Card Tutorial

096 - 098

*Briefing Notes on Multi-Application
Smart Cards - Part 6*

*NB: This set of tutorials will be available to purchase
online in spring 2000*

098 - 099

*SCN Multi-Application Development Kit:
Software Architecture*

Cards on the Cover

**Motorola's tick.et ~ this issue's
Collector's Corner card**

Card free to subscribers

Southampton's SmartCities Pilot

Cover Story

Carta Sanitaria ~ Italian Health Card

Page 087

Bull's Smart EMV

Page 090

Main Photograph

CardTech/SecurTech Show, Florida

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Don't Forget!

Our Website, containing On-Line News, a Library of Smart Cards and information about the full range of SCN services, can be found at the following address: www.smartcard.co.uk

Southampton SmartCities Pilot

Continued from page 81

Council Leader, June Bridal, said: "SmartCities brings together the specialist skills we need to create a blueprint for an open, easily-replicated solution that other European cities can implement with minimum start-up costs."

SmartCities aims to design a dynamic Smart Card and multi-application management architecture which will enable mid-sized cities to reap the benefits of Smart Cards, without being tied to one proprietary model. Essential to the viability of the scheme is the ability to add and remove applications from the Smart Card, using either a public-access city terminal, dual-slot mobile phone or Internet-connected PC.

Partners and responsibilities

Schlumberger is responsible for overall project management and to lead the development of the open systems architecture and cards, application management systems, application software and mobile applications. In the pilot phases, it will be responsible for systems integration.

Southampton City Council, the "vision owner" for the scheme, will participate with an evolving portfolio of applications and take responsibility for the project evaluation.

Europay International will provide the electronic purse and e-commerce solutions.

Motorola, a leader in mobile communications, will enable the SmartCities card to be used on the move.

The University of Southampton will provide 'proof of concept' in two major end-user roles. It will explore how the scheme can facilitate access to advice, information and learning materials, individual learning accounts and management of individual records of achievement. The University's Uni-Link bus service, catering and access to sport and recreation facilities will be brought into the project.

IT Innovation will provide a high-performance Web-based information analysis.

Technolution will provide software development.

CRID (The Centre for Research on Computers and Law) at the University of Namur, Belgium, will provide legal expertise on IT law, especially on privacy, authentication and liability issues.

The City of Göteborg, Sweden, will provide independent analysis and project evaluation.

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Gemplus Buys ODS Landis & Gyr

Gemplus has bought ODS Landis & Gyr, the Smart Card division of Landis & Gyr Communications, and plans to reinforce its market position in Germany and central Europe.

ODS is a well-established supplier of Smart Cards focussing on banking, telecommunication and pay-TV and is an important player in the German banking segment with expertise in GeldKarte electronic purse technology. The company has about 240 employees at its offices in Ismaning, near Munich, and its production site in Seebach. Last year it achieved a turnover of approximately DM 70 million.

Marc Lassus, Chairman of Gemplus' Supervisory Board, said: "In our fast growing market, this move will allow us to enhance our expertise and to strengthen our German presence. We welcome a group of highly experienced and dynamic specialists with a very good marketing and technical knowledge and an excellent reputation in terms of quality and service."

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Smart Medical Card for Jordan

Jordan is rolling out a Smart Card-based medical records project that automates patients' medical and insurance information. The aim is to provide quick and secure information for quality patient care and prompt claims processing.

The scheme, by the National Health Insurance Administration Company of Jordan, is launching in the capital of Amman with 400 Smart Card readers. The system will use microprocessor-based M.O.S.T Smart Cards from CardLogix, PC Pay readers from Innovonics, and eClaim software from IdealSoft.

Doctors, pharmacies, hospitals, laboratories and radiology centers in the Greater Amman area are being issued with a PC Pay hybrid Smart Card and mag-stripe reader capable of reading the M.O.S.T. Card through an Internet browser.

The healthcare provider is able to examine insurance and medical information for the patient by inserting the provider card and the companion card presented by the patient at the point of care. Everything from blood type to benefits status can be viewed, updated and stored on the two cards simultaneously, ensuring accurate records and appropriate care.

The cards must be used at the same time, providing patient control and privacy. Additionally, card data is encrypted to prevent tampering.

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GAIT for Roaming Worldwide

Schlumberger has announced Simera GAIT, a new Java-based SIM (Subscriber Identity Module) Smart Card that allows mobile subscribers to roam with ease between GSM and TDMA networks worldwide. For TDMA operators which dominate the market in the Americas, parts of Asia, and Russia Simera GAIT opens up the world of GSM value-added services. For GSM operators, it provides the opportunity to expand beyond their primary markets in Western Europe and Asia-Pacific.

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Hybrid Card Reader from Mag-Tek

Mag-Tek has launched the Intellistripe 65, vandal resistant, hybrid card reader designed for unattended terminal applications such as kiosks, vending machines, petrol payment terminals and ATMs. The unit can read up to three tracks of magnetic stripe and read/write to ISO 7816, T=O, T=1 micro-processor cards and a range of memory cards.

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SmartAxis' first ISP Link

The Positive Internet Company, one of the leading European web hosting and e-commerce providers, is to link with SmartAxis to enable its 2,000 web site customers to accept Smart Card based electronic cash payments.

SmartAxis is a payment service for low-value and digital goods over the Internet and mobile networks. The service is currently operational and supports Sterling via Mondex and Belgian Francs via Proton. It has recently announced its collaboration with Europay to bring the SmartAxis service to their Clip e-purse brand. The service is being extended to support all major Smart Card based e-purses or loyalty schemes in any currency.

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Safeguarding Medical Records

Oberthur Card Systems is to supply Smart Cards with the MULTOS operating system to LifeGard Technologies for a patient card healthcare pilot project in the UK this summer.

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Motorola AFC Systems for China

Motorola, through its Huamin Beijing Smartcard System Joint Venture, has been awarded two Smart Card-based contracts in China.

One is for the design and implementation of a contactless Smart Card automatic fare collection (AFC) system from Lanzhou Public Transit Co., in Lanzhou, a city of three million people in Northern China. It includes cards, hardware and back office software as well as system integration and management.

The contract involves equipping 800 buses. In the first phase, about 120,000 monthly pass holders will receive Motorola M-Smart Mercury high-speed contactless fare cards and the equipment of 500 buses.

The second contract was awarded by the Changde Public Transit Co., for a multi-application Smart Card system in Changde, China. It is planned to start the project with an automatic fare collection (AFC) system and then grow the Smart Card platform into a broadly used payment method for public utilities, water, gasoline and taxi services.

Motorola will design and implement the AFC system for the bus system, which serves the city's 600,000 residents, and supply the software system platform for multi-applications implementation.

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GemSAFE Enterprise Shipping

Gemplus has announced the availability of its GemSAFE Enterprise Suite comprehensive Smart Card-based solution for enterprise-wide corporate security which enables corporations to conduct secure business-to-business commerce by utilising PKI solutions enhanced by Smart Card technology.

A GemSAFE Enterprise 5-user evaluation kit is available for US \$995 and includes software, Smart Cards and readers.

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SETEC Multi-function Java Card

Setec is developing a high security multi-function Java Smart Card designed for securing e-commerce and electronic transactions. The new card will be available early next year.

To ensure the product meets the needs of the Smart Card market, Setec will incorporate technologies from Sun Microsystems, Philips and Visa. Card security will be formally proven by a Common Criteria security valuation at level EAL-5 and will also be evaluated according to the US security standard, FIPS 140-1.

Setec has chosen the high-security 16-bit SmartXA Smart Card controller architecture from Philips Semiconductors for the hardware platform of its Java Card product. SmartXA will undergo a separate hardware security evaluation according to Common Criteria EAL-5 and FIPS 140-1

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G&D Fingerprint Technology

Veridicom, a leading provider of silicon-based fingerprint authentication solutions, and German Smart Card manufacturer Giesecke & Devrient (G&D), are partnering to create the next generation of highly secure Smart Card products using Veridicom's patent-pending Match-on-Card fingerprint technology.

Veridicom's Match-on-Card technology uses fingerprint authentication to unlock the card and provide access to an enrolled user. For added security, fingerprint matching operations are conducted entirely on the Smart Card itself.

The joint development agreement with G&D marks the second Match-on-Card technology partner for Veridicom. A similar agreement was signed with French Smart Card manufacturer Gemplus (SCN March 2000 page 52).

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Breakaway Groups New Company

Bluefish Technologies, a new company financed by ACG and run by four ex-ORGA senior employees is being launched to address the rampantly growing market for Smart Cards.

Bernd Deutschmann, who established ORGA's Smart Card activities in the early 1980s with the development of the world's first microprocessor Smart Card with reusable memory and Heinz Schafers, Paul Hill who was co-founder of ORGA UK and Jon Twigg, all recent employees of ORGA have decided to form a new company with a different approach to supplying the SIM card market.

Bluefish will not manufacture cards, instead they will work with card manufacturers who are willing to embed Bluefish operating systems and products into their SIM cards. Paul Hill, CEO at Bluefish, said: "This is not a new concept. It is well established in the PC industry where there has long been an unbundling of hardware and software. We are just bringing this well proven concept to the SIM card market, which is a new approach for this industry."

Bluefish will be developing their own quality assurance processes so that network operators can be assured that partners working with Bluefish will meet with their requirements. Bluefish will also be focussing on application development and services.

ACG will own 51% of Bluefish, 39% will be owned by the management and employees with the remaining 10% reserved for an un-named venture capitalist. "In working with ACG, we have both an ambitious and financially secure partner, who recognises the strategic importance of this market," said Paul Hill.

In 1999 ACG AG took over w.w.Chip AG and acquired Semiconsult GmbH. Continuing its expansion strategy in the area of chip brokerage for the semiconductor industry ACG earlier this year took over MGI, one of the largest specialised chip brokers in North America and recently in a joint venture with Utimaco Safeware formed a new company Omnikey AG operating in the field of RFID, Smart Card readers and terminals (see page 92).

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Nigerian ValueCard

A group of Nigerian banks are working on a common electronic purse, called ValueCard, through Smartcard Nigeria plc for roll-out this year. Participating banks represent more than 90% of the banking system in Nigeria.

The Nigerian scheme is multi-issuer and multi-acquirer. Merchants can work with any bank of their choice or with several banks simultaneously.

The role of Smartcard Nigeria is to promote the ValuCard brand and to act as clearing house for the banks. The software for the project was provided by CardBase Technologies, of Dublin, Ireland. Cards come from Gemplus and other suppliers include DataCard, VeriFone, and Ascom Monetel.

ETSI Smart Card-related Bodies

ETSI, the European Telecommunications Standards Institute has created two new technical bodies - the Technical Committee for Access and Terminals (ETSI TC AT) and the ETSI Project for Smart Cards, 'New SMG9'.

The goal of Technical Committee Access and Terminals is to expand and maintain expertise with regard to the interaction between terminals and networks, whether private or public, switched or non-switched.

Karl Heinz Rosenbrock, ETSI Director-General, said: "TC AT is now 'the home' for terminal activities within ETSI. To face the challenge of market globalisation and the emergence of new technologies, terminals have to be able to interoperate over the network."

The ETSI Project for Smart Cards, or 'newSMG9' (because it replaces the existing ETSI Technical Subcommittee, SMG9, which was responsible for the standardisation of the SIM card for GSM), will enable ETSI to create a central focus point for the standardisation of a common IC Card platform for 2G and 3G mobile telecommunications systems.

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Italian Healthcare Card

PCU Italia SpA is co-operating with Finsiel SpA and the Italian Healthcare Ministry on Netlink - an international project involving Italy, Germany, France and Canada.

PCU is involved in the card design, personalisation and distribution by mail; and the PC/SC terminals design, installation and maintenance at all the physicians surgeries. The company will also design a PKI infrastructure enabling doctors to sign and encrypt their prescriptions and referrals.

The cards include 32K byte EEPROM Java Smart Cards and cryptocards. They will store personal data, emergency data and other significant health data. The same card will be used in the future for storing prescriptions. The cards issued to the physicians will have encryption capabilities.

The project will start in four towns in the north of Italy (Imperia, Pinerolo-Turin, Trento, Bolzano). Global figures for the pilot phase are: about 150.000 patients' Smart Cards, 1,000 doctors' Smart Cards, 1,000 Smart Card readers (some connected to PCs; others standalone for ambulances and first aid sites) and PKI (Public Key Infrastructure) services.

The Italian Healthcare Ministry is forecasting the roll-out of the project throughout Italy, involving more than 50 million cards and 200,000 terminals by 2003.

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Datacard Chief Financial Officer

Datacard Group has appointed Jeffrey J Hattara as Chief Financial Officer to replace Paul Schroeder, who was recently appointed General Manager of the company's Secure Issuance Division.

Hattara will also serve as financial advisor and representative for Datacard Group's Board of Directors. Previously, he was CFO for Minneapolis-based BMC Industries.

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FIPS 140-1 Certification for Rosetta

SPYRUS has announced that its Rosetta Smart Card is the first to receive Federal Information Processing Standard (FIPS) Pub 140-1 Level 2 certification from the National Institute of Standards and Technology.

The Rosetta Smart Card uses the SLE66CX160S 16K bytes EEPROM chip card cryptocontroller from Infineon Technologies.

"Breaking this major barrier to entry for potential consideration by the government is a big step for Infineon and SPYRUS," said Joerg Borchert, Infineon's North America Corp. Vice President for Security and Chip Card ICs.

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Smart Card for US Army in Bosnia

US soldiers with the NATO peacekeeping mission in Bosnia-Herzegovina are using Smart Cards for personal purchases from a haircut to a burger.

ICL's SmartCity multi-application card is being used to help staff and visitors pay for goods and services. Remote bases have few amenities, but commercial "food courts" operating mostly in tents and post exchanges are available.

The system, commissioned by the US Treasury Department, was implemented by ICL's e-Business services company and eliminates the need for personnel to carry cash and cuts the risk of theft.

Thousands of cards in circulation are used for haircuts, shoe shines and even hamburgers from fast-food outlets, as well as stamps, gifts and CDs. The cards can be reloaded with value at the military's finance office. Smart Card vendors have been issued with small, portable point of sale terminals that use battery back-up power.

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PubliCARD Forms Infineer

PubliCARD has brought together its two subsidiaries, Tritheim Technologies, Inc. and Absec Ltd., under the new name Infineer.

“Broadband’s potential to revolutionise practically every aspect of our lives is becoming more and more a reality,” said Infineer President and CEO Jan-Erik Rottinghuis.

“Joining these two divisions into a single organisation brings sharper focus to our Smart Card intellectual property that will result in innovative broadband solutions.”

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Infineer to Pilot eCoupons

Infineer (see above), the new subsidiary of PubliCARD, is to conduct the first Smart Card Internet-based eCoupon pilot later this year.

The project will enable selected participants from the loyalty program of a major regional supermarket chain to download eCoupons from various web sites directly onto the store’s loyalty Smart Card.

When next buying groceries, the customer can redeem the eCoupon by inserting the card into a reader at the checkout. The value of the eCoupons for the purchased promoted items is automatically deducted from the grocery bill increasing both consumer loyalty and manufacturer brand promotion.

Infineer will deploy its SmartCOMMERCE technology at the supermarket’s web site ensuring the secure delivery of the downloaded eCoupons onto the Smart Cards. SoftCARD will provide all the store-based systems and technology where shoppers will be able to add eCoupons to their loyalty cards using special shelf mounted dispensers designed by SoftCARD. Infineer will also provide participating consumers with special Smart Card readers that can be attached to their home computers.

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Hitachi Takes Stake in Zaptronix

Hitachi Europe is to take a 27% stake in Zaptronix, subject to approval from Zaptronix shareholders. The ZAR 16 million (2.5 million euros) contract will see the companies work together to develop e-commerce solutions across the EMEA region.

The companies plan to develop a range of Smart commerce solutions, including Internet kiosks for the retail and public sectors such as ticketing applications for public transport and access to local and national government information via kiosks in hotels, shopping centres and other public amenities.

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Asian Contracts for Omnitech

Omnitech has announced three new contracts in Asia through its subsidiary VFJ Technology. One contract is to install an access control building management system for the Beijing headquarters of China Resources, the official retail outlet for China handicrafts.

VFJ will also provide Smart Card-based technology for an estate management control and bus validator system for Henderson Land, a large property developer in Hong Kong. Smart Cards will be issued to all the residents of the new Tseung Kwan O 1,200 units development providing them with access to the appropriate buildings and bus system that will operate in the residential development.

The third contract involves the provision of a one-card multi-application tollway system for the North Eastern Heilongjiang province in China.

Project in India

In an alliance with Gemplus, VFJ is to install its new CCR-120 access control readers and multi-application Smart Card system to provide personnel and building management control for a client in the state of Karnataka, India.

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CardTech/SecurTech Show

Visa and MasterCard chose the CardTech/ SecurTech show in Miami, Florida, earlier this month to make major announcements. Visa revealed it had made special pricing deals with Smart Card companies to help member banks move to chip technology while MasterCard announced a \$50 million fund to invest in technology companies working on new types of payment systems.

Both card issuers, having failed to encourage US banks to adopt Smart Cards and spurred on by the success of the American Express Blue hybrid card, are now trying to encourage market development. An additional worry is the potential impact of mobile commerce and the possibility of digital phone users making purchases on the Internet by phone and charging them to their phone bills instead of through a credit card account.

Visa is using its market clout to induce price reductions for banks that agree to convert their payment cards from magnetic stripe to chip cards. It says its pricing program is aimed at kick-starting the market and that a typical offer could halve the cost of implementation of a Visa Smart Card program.

The card issuer says that to date discounts have been negotiated with ACI Worldwide, IFS International and NBS Technologies and will be available for a limited time period and for a limited number of early adopter banks.

MasterCard plans to bankroll companies that seem to offer a strategic partnership and significant financial returns. The \$50 million investment fund is designed to invest in companies that offer payment technologies and solutions in areas such as Smart Cards, e-business and mobile commerce. The scheme will apply to both start up firms and established companies.

MasterCard has also donated \$5 million to create a new electronic transactions laboratory at the Massachusetts Institute of Technology (MIT).

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Cards for Cholesterol Sufferers

Lifestream Technologies presented its Privatlink solution, developed with Microsoft, for people suffering from high cholesterol levels. Their application on Smart Card for Windows creates a secured Smart Card Internet Portal and opens up new opportunities over the Internet.

The system is aimed at the estimated 98 million people in the USA with high cholesterol levels.

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Gemplus Launches ThinkPulse

Gemplus formally announced the launch of a new company, ThinkPulse, Inc., that will commercialise the smartX software technology introduced by Gemplus last year to provide a unifying application framework for Smart Card development across multiple platforms and operating systems.

The privately held company, headquartered in San Jose, California, will design and market smartX software products and web services that will simplify Smart Card-based application development and deployment, enable card and terminal independence, and allow for web-based maintainability.

ThinkPulse also announced availability of the smartX run-time engine in both Java and Win32 versions.

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Proton and ACI partner

Proton World and ACI Worldwide announced a partnership alliance to provide a combined solution for e-commerce and other payments that will combine the Proton R4 Smart Card management package with the ACI host and back office system.

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New Products from Bull

Bull Smart Cards & Terminals unveiled the Smart-EMV 1000, a new debit-credit card compliant with EMV specifications. The 8K bytes card has the capacity to manage multiple applications.

The card has just been certified by Visa for Visa Smart credit and debit applications, and is now available to Visa card issuers.

Bull also showed SecurTouch, its new micro-processor card combining electronic purse and ticketing applications for the public transport market.

"Bull aims to integrate contact technologies, such as e-purse, and contactless and hyperproximity technologies, for sectors such as public transport, in one single chip, at an attractive price for our customers," said Philippe David, Bull's Marketing & Sales Director, Banking & Transport sector.

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Motorola Dual Interface Card

Motorola announced its M-Smart Venus MV5000 second-generation dual interface (contact/contactless) multi-application Smart Card. According to the company, the card integrates a hardware cryptographic engine and other enhancements to cut contactless transaction time in half compared with currently available cards.

A second version, the MV5100, also supports the Proton 3 Electronic Purse and Proton Easy Entry banking applications from the contact interface providing a multi-application platform supporting both contactless automatic fare collection (AFC) and the Proton stored value system.

Armand Linkens, Proton World's Managing Director said: "Mass Transit is a key strategic market for Proton World. We see AFC as an important application for Smart Cards and an ideal ally for e-purse and stored value applications."

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Free source code for MULTOS

MAOSCO, promoters of the MULTOS multi-application Smart Card operating system, demonstrated card based e-commerce banking and payment applications and provided the source code free.

The demonstrator was designed and developed by UK based e-commerce consultancy Consult Hyperion.

By giving away the source code on CD ROM for developing real MULTOS systems, MAOSCO aimed to assist application developers and card issuers in building solutions for secure e-commerce.

The code is also available for download at:

- ✉ www.MULTOSTechNet.com
- ✉ www.Consult.hyperion.co.uk

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UBS joins Open Platform

United Bank of Switzerland (UBS) has joined the Swiss Open Platform Smart Card program. Following a pilot with Swiss Post and Cornèr Bank, it is planned to issue EMV compliant Smart Cards based on JavaCard technology and the Open Platform specifications to all customers. The cards will be used for both payment and non-payment functions, including Visa Smart credit and debit applications.

Contact

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HyperProximity contactless chip

HyperSecur Corporation announced that its HyperProximity technology has been implemented in the ST16HF52 contactless chip from STMicroelectronics and is now in commercial production.

Contact

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Cubic Smart Card Fare Solutions

Cubic Transportation Systems (CTS) announced a set of technologies designed to move mass transit fare collections to a Smart Card based system.

The system, Nextfare Solution Suite, is a package of tools that can be integrated with automatic fare collection systems.

The system includes a series of add-ons and equipment designed to work with a central computing application. These include: Nextfare Auto Load which allows users to add fare products to their cards instantly; Nextfare Express enabling employers to automate and decentralise distribution of transit benefits to employees; Tri-Reader, a contactless Smart Card reader capable of reading any ISO 14443 Smart Card, and Cubic's own Go Card contactless Smart Card.

Contact

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MagIC 9000 Mobitex Terminal

Schlumberger Smart Card & Terminals introduced MagIC 9000 Mobitex, a Smart Card-ready, wireless point-of-sale terminal for secure credit and debit card transactions with the announcement that it had already received "significant" orders from Royal Bank of Canada, Millennium Money and eXcape/InterPOS.

The new POS terminal, which has multi-application capabilities, enables transactions to take place virtually anywhere.

Contact

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Online lottery system

Intelligent Media Systems (IMS) demonstrated the FunLotto Internet-based lottery system, combining Smart Cards, the Internet and IMS' MediaFLX software platform.

Contact

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SmartAxis demos Proton in pesos.

SmartAxis provided a technical demonstration of Internet purchases in Mexican pesos using Proton-based e-purse Smart Cards.

The initiative, with Proton World and its Mexican licensees Inbursa, (Mexico's leading clearing bank) and Telmex, (the Mexican national telephone operator), could lead to SmartAxis-enabled e-merchants worldwide being able to accept transactions from Mexican Proton e-purse holders.

SmartAxis is currently engaged in discussions with Inbursa regarding a full deployment in Mexico.

Contact

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CryptoCash from Zaxus

Zaxus (formerly Racal Security and Payments) announced CryptoCash as a secure mechanism for the mass loading of value onto reloadable Visa Cash cards. The application is currently undergoing EMV testing and approval, and will be available in third quarter 2000.

CryptoCash is a stand-alone, PC-based application for Windows NT and processes the Visa Cash card either through an automated batch encoder or a manually fed Smart Card reader. Batches of up to 400 cards at a time may be handled automatically. CryptoCash provides summary reports and secure audits that make it easy to use.

Contact

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Proton World to open US office

Graham Frost, Deputy Managing Director of Proton World, told a press conference that the company would be opening a sales office in Orlando, Florida, later this year to consolidate current efforts to promote the Proton technology in North America.

Contact

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✉ info@protonworld.com

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GSA joins GlobalPlatform

US Government department, the General Services Administration (GSA), has joined GlobalPlatform, the cross industry Smart Card group developing an international standardised infrastructure for multi-application Smart Card services.

GSA already uses multi-application cards. Last year it issued Smart Cards to its employees in the Washington DC area. In Fairfax Virginia, employees can use their cards for purchasing, travel, building and computer access, phone calls, digital signatures for e-mails and for direct boarding of airline flights.

Contact

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Oberthur/Philips Smart e-Wallet

Oberthur Card Systems is partnering with Philips Digital Networks to develop a secure, flexible and personalised e-wallet service.

The e-wallet, to be accessed via a set-top box and displayed on the TV screen, will allow secure payment access.

The e-wallet service is based on Oberthur's AuthentIC card solution which allows a card to be inserted into a dual-slot set-top box with the conditional access card occupying the remaining slot.

Future developments look to combine access to the TV and access to the e-wallet on one card. GlobeID, will provide the software for the e-wallet.

Contact

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Internet security by Smart Card

ORGA Kartensysteme introduced its Smart Card Goes Online (SGO) web authentication system which enables companies offering services using the Internet to actively protect and control their content.

Utilising a Smart Card with cryptographic access protection, companies can offer customers access to all of their services, as well as individual packages. By using both the Smart Card and a unique PIN, active protection and control of all services used is guaranteed.

The SGO server application is designed to run on the LINUX operating system, while the client application is Windows based, and works with both Microsoft Internet Explorer and Netscape.

The basic starter package comes complete with server and client software, 2 ECO 5000 Smart Card readers and 5 SGO customer cards.

Contact

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Multi-application operating system

SERMEPA (Servicios para Medios de Pago) debuted Advantis, the first multi-application operating system that combines both EMV standard credit and debit applications with the CEPS electronic purse. It includes a crypto-processor to allow the generation of a secure electronic signature via a public key encryption algorithm.

Contact

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Over 20 million Java Cards shipped

Sun Microsystems announced during the show that more than 20 million Java Card technology-based Smart Cards were shipped in 1999 and strong growth was anticipated for the year 2000.

Demand for incorporation of Java card technology was strong across a wide range of industry sectors, including mobile telephony, financial services and government, said Sun, adding that licensees have developed more than 20 different Smart Card products that incorporate the Java Card platform.

Contact

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ACG and Utimaco Set up Omnikey

ACG AG (with MicroDatec GmbH, Kronegger Informationssysteme and Celectronic GmbH) and Utimaco Safeware AG have set up a joint venture called Omnikey AG, which unites several companies operating in the field of Smart Card readers and terminals as well as contactless technology. The new company is headquartered in Wiesbaden.

Omnikey will initially cover three product areas. With Smart Card readers for PC applications, Smart Card terminals for POS payment applications and contactless writing and reading systems for the RFID, the company plans to position itself as a leading OEM manufacturer of identification technology.

Utimaco Safeware is a leading manufacturer of Smart Card-based security solutions, MicroDatec specialises in Smart Card reading systems, Celectronic manufactures chip card terminals for health insurance cards and cash card applications, while Kronegger Informationssysteme specialises in contactless writing and reading systems with standardised modules.

At the recent CardTech/SecureTech show in Miami, Florida, Omnikey launched its new CardMan 1010 Smart Card reader. It comes with PC/SC drivers for easy integrations into all kinds of PC applications such as purse applications, Internet-based Smart Card schemes or home banking.

Contacts

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Statoil Order for Hypercom

Scandinavian oil company, Statoil Detaljhandel Skandinavia, is to deploy Hypercom Financial Terminals AB's card payment terminals to support bank and fuel card transaction processing at its petroleum stations throughout Sweden. The number of terminals now ordered is 900.

Bjorn Eriksson, project leader, Forecourt Automation Systems for Statoil Detaljhandel Skandinavia, said: "Hypercom's HFT 117 terminal reads all types of payment cards, allows the secure input

of personal identifications numbers (PINs) and is extremely easy to use. Additionally this Hypercom terminal model provides us with a platform for future acceptance of chip-based credit, debit and electronic purse cards."

Contact

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LeapFrog Jumps into Asia

Leapfrog Smart Products has announced a \$20 million contract to provide Smart Card services to the Asian market in a collaboration between Leapfrog and a group of Asian investors under the title Smart Products International (SPI), which will work with groups in Malaysia and Singapore.

SPI is to provide Smart Card services for the next 10 years, although the majority of this contract will be carried out in the next three years.

Jim Grebey, Corporate Technology Officer at Leapfrog has been appointed President of SPI which plans to open offices in Malaysia, Singapore and Australia this year.

Contact

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Learn2.com Card for Staples

Learn2.com, a provider of e-learning solutions, has announced an agreement that will promote the Learn2.com Smart Card to customers in all Staples retail stores in the US. More than 70,000 Smart Cards will be shipped in the initial distribution.

The card provides users with the information they need to directly access Learn2.com courseware. The Learn2.com Smart Card includes an encoded serial number and unique URL, which represents a specific Learn2.com online courseware library customised for the company or employee, and instructions to access the courseware at work, at home or on the road.

Contact

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TSA Acquires Chipper Technology

Transaction Systems Architects, Inc. (TSA), provider of enterprise e-payment solutions, has acquired the intellectual property rights of the Chipper multiple application Smart Card scheme from Postbank NV, a wholly owned subsidiary of the ING Group.

TSA and Postbank have entered into a long-term co-operation agreement for TSA's Electronic Commerce business unit to provide continuing support and development for Chipper which is used by more than seven million Postbank customers in The Netherlands. Originally founded in partnership by Postbank and KPN Telecom, the scheme has been in operation for more than four years.

Hans Dijkman, Executive Vice President of Postbank, said: "We have always had great faith in the future of the Chipper scheme and TSA will help us to migrate to the new infrastructures that Euroland and international interoperability demand. Our Chipper customers can expect to see more and more ways in which they can use their card to gain greater access to services and more convenience over the coming years."

Under the agreement, TSA will take over the staff and assets of the Chipper development team. Chipper Netherlands, the operating company and the Chipper Purse Scheme, will remain with Postbank.

Contact

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Upgrade to Acquire Instacache

Upgrade International Corporation has signed a Letter of Intent to purchase the assets of NCC SmartCard.com LLC (formerly NationalCacheCard Company) (NCC), including its Instacache electronic purse applications.

The US General Services Agency has approved the Instacache software for government stored value applications, and has demonstrated the technology in their GSA/Navy Smart Card Technology Center in Washington, DC.

Contact

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Motorola Shipping 32-bit Card

Motorola has announced the shipping of its new Internet security application that works with its 32 bit M-Smart Jupiter multi-application Smart Card.

FLEXgate addresses a growing demand for increased network security from the Internet community, by using Smart Card technology. The application addresses Internet security by storing information on the card, rather than on the computer. The user can carry information from machine to machine, and prevents unauthorised persons accessing the information.

The card owner is verified by means of a PIN, which completes the two layer security method.

Contact

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BBAN to acquire Smart Card Plant

A subsidiary of BroadBand Wireless International Corporation (BBAN), iTell Inc, has entered into an agreement of principal with M.T.I. C.A. Valencia, Venezuela for the purchase of 65% of the private company's shares.

M.T.I. is the first Smart Card manufacturing plant in South America, with a fully functional printing manufacturing facility which produces Smart Cards, pre-paid phone cards, debit and credit cards.

As well as supplying Smart Cards to companies in South America, iTell is also planning to use this facility to supply contracts in Spain and Italy.

Contact

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Oberthur Personalisation Service

Oberthur Card Systems has formed an alliance with Visa to provide local Smart Card personalisation services to Visa member banks for Open Platform cards as well as proprietary platform cards.

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Smart Card Migration in Brazil

MasterCard International, working with member financial institutions, will begin to migrate its entire card base in Brazil from magnetic stripe to chip technology. The program is expected to get underway in September 2000.

The objectives are fraud prevention and processing cost reduction. Chip cards will also enable financial institutions to integrate their card products into their e-commerce strategy.

The Brazilian banks will introduce MasterCard-branded Smart Cards using the MasterCard M/Chip credit/debit application, based on the EMV standard.

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Rosetta Re-Programmable Reader

SPYRUS, the Internet ID company, has announced the release of the Rosetta Personal Access Reader 2 (PAR2), a low cost, portable, re-programmable Smart Card reader that can be used both in stand-alone mode, as well as in a tethered PC/SC mode for personal computers.

Slightly larger than the Smart Card itself, the design of the reader allows it to fit easily into a purse or pocket for standalone applications such as e-cash balance checking, calculator, etc.

The reader also readily slips into a docking station for use at the office, at home or anywhere secure conditional access is required for PC-based Smart Card applications.

The reader includes Windows PC/SC compatible drivers and supports T=0 and T=1 asynchronous cards as well as synchronous cards.

It can be programmed to support Visa Cash, Proton, Mondex, or any other electronic cash payment schemes, in addition to loyalty and security applications.

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Semiconductor Industry Awards

Dr Peter Keucher, of Infineon Technologies and Horia A Grecu, of Motorola, have won the 2000 SEMI (Semiconductor Equipment and Materials International) Award for Europe for their significant efforts in the introduction of next generation semiconductor manufacturing technology.

General Manager and Deputy General Manager respectively of Semiconductor 300, the Infineon and Motorola joint venture, they led the first 300mm wafer manufacturing facility.

Walter Roessger, Vice President of SEMI Europe, said: "Through their extensive efforts, they have greatly contributed to the advancement of the global semiconductor industry and its transition to the next wafer size. In addition, they have enhanced the stature of the industry regionally by bringing Europe into a leadership position in advanced semiconductor manufacturing."

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Campus Pipeline/CyberMark Team

Campus Pipeline and CyberMark have formed an alliance to combine CyberMark's Smart Card technology with Campus Pipeline's college and university intranets to enable schools to issue ID cards that can be used as secure electronic identification for online campus services.

Colleges and universities will be able to use Smart Cards for campus ID and Campus Pipeline intranet and e-mail authentication as well as access to dormitories and buildings, and library services. Eventually other features may be added such as digital certificates, loyalty programs, transit passes, electronic purses, voting applications and parking.

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- **Tom Burke** CyberMark
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Keyware Using Java Card Platform

Keyware Technologies, provider of biometric identification solutions, has announced an effort to stimulate the development of biometric applications with Sun's Java Card platform for Smart Cards.

"We are excited about this announcement from Keyware that gives Java technology developers the opportunity to design and develop biometric applications for the Smart Card market," said Jennifer Yonemitsu, Product Manager, JavaCard Technology. "Because of Java technology's multi-application functionality and inherent security, Keyware has chosen the Java platform as a means to further enhance and expand the biometrics industry."

Keyware's layered biometric technology provides Smart Card users with a method of securing access to the multiple forms of information. By providing a combination of a PIN code and voice, face and/or fingerprints, users will be protected from unauthorised individuals and personal information stored on the card will be secure.

"We see Sun's Java Card technology as enabling the development of innovative applications for biometrics," said Mik Emmerechts, Director of Business Development, Keyware Technologies.

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Labcal Unveils SmartSign

Labcal Technologies has unveiled SmartSign, a combination Smart Card/reader-writer, that sets new speed records for the reading and generating of key pairs and digital signatures. Used for PC-based identification purposes, SmartSign provides a low-cost, secure alternative to password-based authentication by incorporating a two factor authentication method - a SmartCard and PIN to Microsoft Windows logon.

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Briefing Notes on Multi-Application Smart Cards- Part 6

Communicating with the Smart Card

Before carrying on with our discussion on Multi-Application Smart Cards we need to review some of the key elements of the ISO 7816 standards for contact Smart Cards. The low level standards (ISO 7816 parts 1-5) are well adhered to by most modern cards but as we shall see later the higher level standards relating to the Open Platform card manager are interpreted somewhat differently by the different manufacturers of Multi-Application cards.

ISO 7816-1 refers to the physical properties of the cards without which it would be impossible to design a general purpose card reader. ISO 7816-2 defines the layout of the contact plate as shown in *figure 13*. Eight connectors are defined but only five are used today. V_{cc} is the supply voltage that drives the chip. Traditionally this was 5 volts but today 3 volts is becoming more common. GND is the ground reference against which the V_{cc} voltage is applied. RST is the reset signal line that is used to initialise the state of the integrated circuit chip after the power signal is applied. CLK is the clock signal that drives the logic element of the chip. In the initialisation phase the ISO 7816-3 standard allows this frequency to be between 1 MHz and 5 MHz. In practice 3.58 MHz is widely used which is a hangover from the early card readers that used widely available clock crystals from the television world. The American NTSC colour sub-carrier frequency is 3.579545 MHz. Most of the Smart Card chips also have a minimum frequency somewhere between 0.1 MHz and 1.0 MHz which is to stop attacks on the chip by single stepping the programme instruction. The I/O counter is the single line by which the chip receives commands and interchanges data with the outside world. V_{pp} is now largely obsolete and was the connector by which the high voltage signal was applied to program the non volatile EPROM (Electrical Programmable Read Only Memory). Today almost all Smart Card chips use EEPROM (Electrically Erasable Programmable Read Only Memory) where the necessary high voltage is generated internally on the chip. Two further connectors (RFU) are reserved by ISO for further use.

The ISO standard defines a single I/O (Input/Out) line for the interchange of data between the IC and the interface device. The transmission characteristics for the Smart Card are based on an asynchronous half duplex mode of operation. Half duplex refers to the need for the line to change

direction depending on whether the IC is transmitting or receiving. Asynchronous refers to the need for synchronisation of each character frame in the message between the IC and the terminal. The well known RS232C standard used on the PC is an asynchronous full duplex mode of operation where there are separate lines for the transmission and reception of data. When connecting a Smart Card reader to a PC one of the functions of the reader is to form an interface between these two communication protocols.

Fifteen transmission protocols (T=0 to T=14) are allowed for in the ISO 7816-3 standard of which only two are in widespread use today. T=0 defines a character transmission protocol while T=1 defines a block transmission protocol.

The transmission of a single character defined as 8 bits requires an overhead of several bits, as follows:

- Start bit (used for frame synchronisation)
- Parity bit (for error detection)
- Guardtime bit(s) (separation between characters)

The format of a character frame is shown in *figure 14*. The receiver examines the I/O line looking for the transition from the mark or high state to the space or low state. The sampling of the line is required to be such that the receiver monitors the state of the line in the centre of each bit period with a precision of $\pm 20\%$. The parity bit is defined to achieve even parity, which means that the number of 1s in the 8 data bits and the parity bit together result in an even number of 1 bits. In the T=0 transmission protocol the guard time is defined to be equal to 2 bit periods. In the T=1 transmission protocol this guard time can be reduced to a single bit.

An Elementary Time Unit (ETU) is the normal bit duration used in the character frame. For the T=0 protocol this is 12 ETU, 1 start ETU, 8 data ETU, 1 parity ETU and 2 guard time ETU. The default value for an ETU is defined as $372/F_0$ where F_0 is the chip clock frequency. For the clock frequency of 3.85 MHz referred to previously we end up with a communications rate of 9622 elemental bits per second (baud rate). The information rate is $8/12$ of this value. Although we are likely to be using 9600 baud in the terminal the 0.2% difference computed over the asynchronous frame is well within the allowed tolerance.

Answer to Reset

After the reset signal is applied by the interface device the chip should respond with the ATR (Answer to Reset) message after 400 clock cycles but before 40,000 clock cycles have elapsed. The ATR is at most composed of 33 characters and consists of 5 fields as follows:

- The initial character (TS)
- The format character (TO)
- The interface characters (TA_i, TB_i, TC_i, TD_i)
- The historical characters (T₁, T₂, T₃.....TK)
- The check character (TCK: Note not asserted when only T=0 is present)

Each of these fields is sent in order as shown in *figure 15*. The initial character TS is really a bit synchronisation pattern which can be used by the terminal for auto baud rate sensing. TS is also used to determine the sense of the transmission logic (i.e. is a '1' high or low voltage) and the order of bit significance.

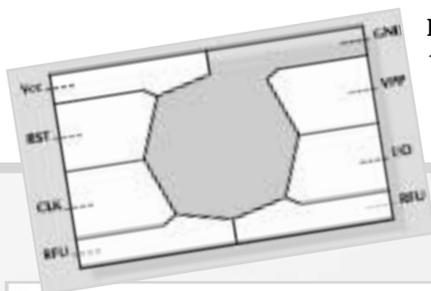


Figure 13
 < ISO 7816-2 Connector Plate

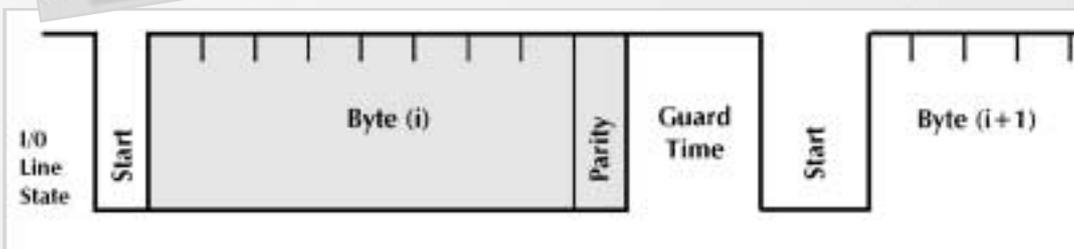


Figure 14
 ✓ ISO 7816-2 Character Transmission

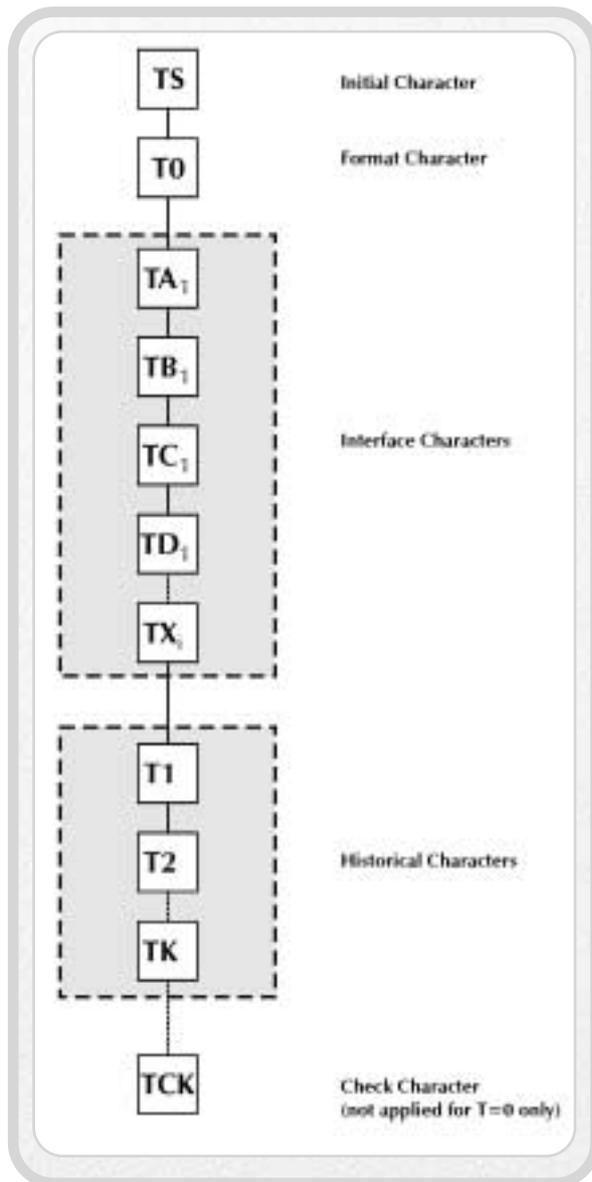


Figure 15
Answer to Reset (ATR)

When decoded by the inverse convention the byte is interpreted as 3F (Hex) and for the direct convention the byte is interpreted as 3B (Hex). The format character T0 provided information necessary to interpret the remaining character in the ATR message. The most significant 4 bits use a bit map to determine the presence or otherwise of TA_i, TB_i, TC_i, TD_i. The least significant 4 bits of the T0 character give the number of bytes of historical characters binary encoded. The use of 4 bits restricts the maximum size of this field to 15 characters. A more detailed interpretation of these bytes has been described by previous articles in Smart Card News.

David Everett

To be continued next month.

SCN Multi-Application Development Kit

Software Architecture

The software supplied with the kit is made up of several layers, which can be seen in *figure 1* opposite. What follows is a brief description of each, with a set of URLs at the end for further information.

At the top end is the JPython¹ interpreter. This is an interpreter for the Python² language written in Java. Python is a fairly new language that is gaining popularity due to its flexibility and ease of learning - in fact; it originates from a University where it was designed to teach programming. It has several features which make it ideal for communicating with Smart Cards, not least of which is the 'slice' mechanism - more of which in future articles.

Another useful property of this layer is that it is an interpreter. As such, the JPython software can accept commands entered at a prompt interactively. In fact, this is the main mode of use for our tutorials.

As the JPython interpreter is written in Java, it can run on any platform that supports Java, including Win9x & NT, Mac and various Unix. It can access all the facilities of the Java language, which are quite impressive, without having to become an expert in object oriented software development. It is also a lot less demanding on system resources than many present Java development environments.

There is a comprehensive set of libraries written in Python that JPython can use for all sorts of activities, and these are included in the kit. If you wish to learn more about the Python language the source files are a good starting point.

To communicate with the Smart Card from JPython we use the next layer down, which is the OpenCard Framework³ (OCF). This is a library written in Java precisely for this purpose. At the top end it provides a very easy way to send messages to the card and receive the response. It can be quite sophisticated in what it offers, to the point where the programmer has no knowledge whatsoever of the underlying message structure. However, for our articles we will use the ability of the OCF to send raw messages to the card.

The bottom end of the OCF consists of drivers to speak to whatever card terminal you wish to use. There are several flavours of drivers, but for our kit we are using the OCF PC/SC bridge. PC/SC is a mechanism used by Windows to speak to Smart Card readers. If you already have a Smart Card reader that has a PC/SC driver you can use it with our kit - you do not need to use the supplied reader.

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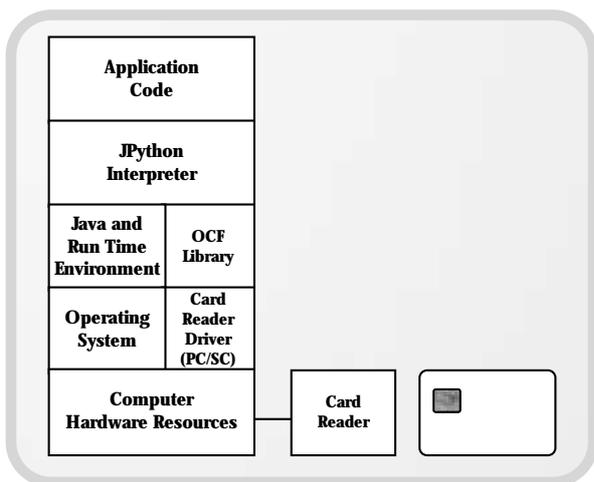


Figure 1
Development Kit Software Architecture

One of the example Python scripts with the kit lists all the known PC/SC terminals installed on your computer.

The PC/SC driver provides a uniform way of accessing the reader, so that our scripts don't know whether it's a reader plugged into the serial port or a PCMCIA type on a laptop.

The next layer down is the Java Virtual Machine⁴ (JVM). This is a software implementation of a computer architecture (hence 'virtual') that can run Java software. As our entire tutorial runs on top of this, using a different architecture than Win32 platforms is possible. To do this a Java Virtual Machine for the target architecture is needed – the Java website holds a list of currently supported platforms. (You would also need a driver for OpenCard for your Smart Card reader; at the time of writing PC/SC was only available on Win32).

Jon Barber

¹ www.jpypython.org
² www.python.org
³ www.opencard.org
⁴ java.sun.com

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