Multi-Application Cards Will Fail, Says Forrester

Forrester Research threw a huge rock into the pond and sent waves crashing through the Smart Card industry last month with the prediction that multi-function cards, viewed by many companies as the way forward, will never materialise.

In a new report called *Europe’s Smart Card Fallout*, Forrester Research says the current move towards multi-application Smart Cards will fail. Instead, the report predicts that firms will issue company-specific cards that allow customers to access networked applications and electronic identification will be a key functionality.

The European Smart Card market will take off but multi-application cards “will never materialise,” says Carsten Schmidt, Associate Analyst in European Corporate Technologies at Forrester.

Continued on page 223
Contents

December 1999

News

223 - 236
Shetland Smart Card
Has Mondex Left it Too Late?
Smart Cards in Korea
Grand Voyageur Loyalty Rail Card
Eurosmart Card Shipment Figures
Virgin Mobile Launched in UK
Cartes 99 Show in Paris
Banks Trial Card flex System
KidCard to be Launched in Norway
Award for Third Millennium
Europe to Lead in Mobile Trading
Visa and SERMEPA in CEPS Test

239
Smart Card News Brings Another Subscriber First

Smart Card Tutorial

237 - 239
Briefing notes on Multi-Application
Smart Cards Part 2

If you wish to subscribe to Smart Card News please complete the form on page 239
Multi-application Cards will Fail

Continued from page 221

Transitioning to multi-application Smart Cards, which offer a better business model and consumer proposition, will pose enormous challenges, says the report.

Forrester believes that several issues, like the right mix of functionality, the inadequacies of existing Smart Card operating systems, and appropriate partnerships, will undermine the multi-application card. Higher costs will also deter card issuers, while telecom advances will eliminate the need to host applications on a card.

As multi-application’s fortunes erode, the rising importance of networks, driven by Internet growth, will finally spell the end of local applications management. Instead, Smart Card issuers will focus on enabling secure access to networked applications that range from retail loyalty programs to electronic ticketing. This shift will bring electronic identification to the forefront of Smart Card functionality.

Forrester believes that firms should first set their priorities. Banks, for example, should start with electronic ID, not just e-purse. To encourage customers to carry a particular card, firms should create customer loyalty through personalisation features. They should also use certificates to bridge the on- and off-line gap by developing cards that are accepted in both realms and making transactions easy via in-store card readers or over the PC.

The research company interviewed 40 companies including banks, telecommunications companies, digital TV operators and insurance providers that either issue Smart Cards now or plan to during the next two years. Sixty-six per cent stated that they are running Smart Card pilots, but these primarily support one type of functionality for their customers - ePurse. However, 59 per cent of the executives interviewed want to move to multi-application cards.

Forrester, headquartered in Cambridge, Massachusetts, has its European Research Center in Amsterdam, The Netherlands.

Contact
■ Claire Powell Forrester Research BV
  ☎ +31 20 305 4396
  www.forrester.com

Shetland Smart Card

Shetland Retailers Association last month launched an island-wide Smart Card loyalty scheme to give the islanders an incentive to spend more locally rather than wait until their next trip to the mainland.

Cardholders are awarded a point for every pound spent and the Smart Card shows the new total every time it is used. These points can be redeemed for various benefits offered by the retailers. The scheme has been designed to be expanded to provide a number of other facilities to ensure a high level of participation, this includes the Islands own electronic lottery during 2000, the ability to load value as electronic cash and to operate an island-wide transport payment system.

Fifty-five businesses from hotels and restaurants to small retailers have signed up for the scheme and it is expected up to 10,000 Smart Cards will be issued.

Charles Smith, a spokesman for the Retailers Association, said: “The Shetland Smart Card provides a loyalty system as sophisticated as any used by the big national groups, and enables us to offer real incentives and rewards to our customers for using local businesses.”

The system was designed and supplied by Scotcomms Technology Group, of St Andrews in Scotland. Smart Cards were supplied by Gemplus and Dione Corporation provided the transaction terminals.

Contacts
■ Kevin Denvir Shetland Retailers Association
  ☎ +44 (0)1595 694959
■ Randal McLister Scotcomms
  ☎ +44 (0)1334 476504
  randal@scotcomms.co.uk

Datagrams Acquires TouristCard

French Smart Card software integrator Datagrams has bought out the TouristCard Corporation and now holds 84 per cent of its shares. The acquisition gives Datagrams the exclusive rights to use the TouristCard application worldwide. The TouristCard system enables the cardholder to obtain discounts when visiting prestigious sites and earn points at the same time.

Contact
■ Hélène Basler Datagrams
  ☎ +33 (0)4 92 96 79 92
  helene.basler@datagrams.com
Has Mondex Left it Too Late?

Mondex International, the electronic cash group, is planning to raise £30 million to penetrate new markets.

The Company, in which credit card issuer MasterCard has a majority holding of 51 per cent, is seeking new investors apart from the banks who make up its shareholders.

Mondex has so far failed to make its electronic cash into a mass market product. The warning signs that the road to mass market status would be a long one were evident during the trial launch in Swindon UK and later in joint trials with Visa Cash in New York, the latter creating even less enthusiasm from the public and retailers alike.

It has, however, licensed the technology to more than 50 countries, the most recent being Mexico and South Korea (see page 225). But despite this, only about one million Mondex cards have been issued in a number of trials.

The rival Visa Cash stored value product claims more than eight million card issued.

Leading the electronic purse field is Proton World International, created by major card players (American Express, ERG, InterPay and Visa International) which has licensed it technology to 16 countries and has over 30 million electronic purse cards in circulation.

Proton was the brain child of Banksys, operator of the Belgium network for electronic payment which launched Proton as the national electronic purse in 1996 (at the same time as Mondex) and then decided to bring in new investors to move it onto the international stage. As SCN said at the time “for Banksys to achieve its aim of making Proton a truly global player, it needs to take on powerful partners.” This they announced in July 1998. Mondex is now in the same position.

So where does Mondex go from here? Apart from licensing the technology to financial institutions around the world, it has had some success in launching the system in a number of universities (closed user groups) with value-added services such as student ID, access control, computer access, library card, vending and voting registration in addition to electronic cash.

It now appears to be planning to target new markets like young people who often do not own a credit or debit card, and service providers who want to collect small payments on-line for such things as computer games, pay television and on-line lotteries.

However, a clear and significant danger for Mondex is the entry of Microsoft Corporation into the Smart card arena with its Windows for Smart Cards operating system. Microsoft believes, as many in the industry do, that it will take a large part of the Smart Card market by storm. Only last month Microsoft said hundreds of corporations will be deploying Smart Cards next year, growing quickly to thousands (SCN Nov 1999, pages 201 and 203).

Mondex has aligned itself and is promoting MULTOS the multi-application Smart Card operating system it helped to develop and which is attractive to banks and other security-sensitive organisations because of its high security rating (ITSEC Level E6) - the highest achieved in the industry.

Just to cloud the issue, Forrester Research has predicted that multi-application Smart Cards will fail to materialise (see front page).

It is possible that there will be a partial divorce between Mondex and MULTOS with Mondex using a modified operating system for its new target markets and leaving MULTOS for franchise licensees.

Who is likely to invest?

Who is likely to invest in Mondex? Ruled out are the card issuing competitors of MasterCard and rival electronic purse operators. Mondex has little to offer them in terms of cards currently in circulation and it would suggest that their systems were inferior.

The best hope for Mondex would be partnerships with the telecommunications and/or related industries as the next big event - starting early next year - will be an explosion in e-commerce and m-commerce with businesses and the public flocking to use the Internet.

Users will need a secure way of paying for small transactions and here Mondex electronic cash can play a major role with the added advantage that the cardholder can top up his card on-line.
Smart Cards in Korea

Two major Smart Card projects in Korea were announced last month involving card issuer rivals MasterCard (Mondex) and Visa.

Mondex Korea is to roll-out in Year 2000 nearly 400,000 multi-application Smart Cards using the MULTOS operating system for debit and credit application, loyalty programmes and ID and access.

Gemplus has been selected as a strategic partner to supply the cards and to provide consulting services.

Implementation has begun on three projects. One will take place at Hanyang University, where MULTOS cards with a Mondex purse and a GemClub based loyalty programme will be issued to students. Another project will take place at COEX, a major convention and exhibition centre in Seoul with the issuing of MULTOS contact and contactless cards, including several applications: Mondex purse, MasterCard credit, Maestro debit, employee identity and public transportation.

Gemplus has signed a long term consultancy agreement with Mondex Korea to provide technical support for these projects and has also taken an equity stake in Mondex Korea, joining existing shareholders MasterCard Korea, Kookmin Bank, Korea Credit Communication Inc, (KCCI), the Amdahl Corporation, KDB Capital and TeraSource Venture Capital.

Meanwhile, Visa and its Members in Korea are planning to phase out magnetic stripe technology in favour of EMV (Europay, MasterCard, Visa) compatible Smart Cards. The first cards will be introduced to customers this month for use in the Yoido financial district of Seoul.

Schlumberger has won contracts to design and supply 40,000 Smart multi-application VSDC (Visa Smart Debit/Credit) cards which will enable Visa’s Korean Members to implement new services, and to substantially enhance security. Issuing banks choose one or more functions, such as credit, debit, loyalty, stored value and e-commerce, and even non-financial applications such as ID and personal health records.

Schlumberger will be supplying card issuing companies KEB Credit Service, BC Card, LG Capital, Samsung Card and Shin Han Bank.

Together these companies share 90% of Korea’s payment card market.

The Yoido project is scheduled to run until the middle of year 2000. This will be followed by the roll-out of Visa Smart Debit and Credit products to the rest of Korea. During this phase, the Smart Cards will feature multi-function applications such as transit, mobile telephony and loyalty. An important feature to be added will be Internet shopping.

Contacts
- Flavie Gil Gemplus
  ☎ +33 (0)4 42 36 56 83
  🌐 Flavie.gil@gemplus.com
- Robin O’Kelly Mondex International
  ☎ +44 (0)171 557 5036
  🌐 Robin.okelly@mondex.com
- Libby Jordan Schlumberger
  ☎ +33 (0)1 47 46 63 12
  🌐 jordan@montrouge.tt.slb.com

French Banking and Transport Card

MODEUS, a French partnership venture involving the Caisse d’Epargne (savings bank network), La Poste (postal services), Société layered multi-application architecture layered multi-application architecture Generale (banking), RATP and SNCF (transport) and France Telecom - has been set up to market a new Smart Card combining transport ticketing, electronic purse, and added-value services.

The same card can be used for metro, train or bus transport, shopping - for bread, newspapers, beverages, etc. - at equipped retailers, and to make phone calls and access supplementary services.

Bull, in partnership with ASK, specialists in ticketing and contactless cards, has been selected to develop the MODEUS system. This involves two cards - the owner’s card and the retailer’s card, and a security component built into the retailer’s terminal. Both cards are required to meet the security requirements of the Banque de France.

The MODEUS project involves the use of contactless technology for public transport ticketing applications, and the combination of banking and transport services on the same card.

Contact:
- Catherine Vincent Bull Smart Cards & Terminals
  ☎ 33 (0)1 39 66 42 63
  🌐 catherine.vincent@bull.net
Grand Voyageur Loyalty Rail Card

French national rail operator SNCF has launched Grand Voyageur one of the first French loyalty schemes to be based on a microprocessor card.

SNCF decided to reward its best customers - the five per cent of passengers who account for a third of all main line revenue.

In exchange for points, Grand Voyageur cardholders receive rail travel bonuses (in the form of train tickets) or a range of ancillary services (hotel accommodation, restaurants) supplied by partners.

Bull has supplied SNCF with over 300,000 microprocessor cards manufactured at its UK plant. In partnership with Euro-Information, Bull has also provided a complete range of services for card owners: customised mail, an introductory booklet and user guide.

Contacts
- Catherine Vincent Bull Smart Cards & Terminals
  - 33 (0)1 39 66 42 63
  - catherine.vincent@bull.net

Medical Information System

HyperSecur Corporation has signed a Letter of Intent with Doctors Hospital Health System in Nassau, The Bahamas, to develop and implement a medical information system incorporating electronic files, secure card-based identification and authentication functions to enable remote access by healthcare providers, insurance companies and other authorised healthcare professionals.

HyperSecur, in partnership with semiconductor manufacturer STMicroelectronics, is developing a contactless Smart Card with a security feature embedded in the chip called HyperProximity. The chip uses radio frequencies to carry out secure transactions at speeds up to 10 times faster than contact cards. The technology will first be implemented in ST’s ST16HF52 contactless chip.

DHHS has 100 medical specialists and employs 326 associates providing a full range of services which include acute care, emergency services, and the latest in imaging technology.

Contact
- Angelo Nichilo HyperSecur Corporation
  - +1 514 288 8882

MasterCard M-commerce Team

MasterCard International has announced the formation of a Global Mobile Commerce Team led by Chris Jarman, Vice President, Electronic Commerce and Emerging Technologies.

It will focus on the convergence of the card payments and mobile telephony industries. MasterCard is already working with member financial institutions, handset manufacturers, and network operators to facilitate on-line payments capability through mobile devices, making them secure, consistent, and globally interoperable.

Industry analysts predict that m-commerce is poised for exponential growth over the next few years. The Global Mobile Commerce Forum (GMCF), a diverse group of international companies working together to enable consumers to use mobile phones to conduct business from anywhere at any time, estimates that by 2001, 50 million people will own a commerce-capable wireless phone.

MasterCard’s Mobile Commerce Team includes representatives from Maestro, Europay, Mondex and MAOSCO. Three forums have been set up to involve key industry players: a Member Forum, composed of MasterCard’s key international members; an Industry Forum, composed of key wireless technology organisations; and a Network Operators Forum.

Contact
- Christina Costa MasterCard International
  - +1 914 249 4606
  - christina_costa@mastercard.com

Multi-function Pilot in Switzerland

Visa International, Swiss Postfinance and Cornèr Banca are to pilot the first multi-function chip cards in Switzerland. The EMV compliant cards will run on Java and the Visa Open Platform.

Cards will offer both credit and debit functionality as well as a home banking certificate. Following a trial period in the 2nd quarter of 2001, the cards will be rolled out gradually to all 1.7 million Postcard holders and to the Cornèr Banca customers.

Contact
- Stacy Torbit Visa International EU
  - +44 (0)171 795 5390
  - torbits@visa.com
Eurosmart Card Shipment Figures

The European Smart Card Industry Association estimates of Smart Card shipments in 1998 show a 28% growth in volume between 1997 and 1998. The figures released last month are said to represent 90% of the whole industry’s delivery.

A total of 1,154 billion Smart Cards were shipped last year compared to 900 million in 1997. Some 248 million microprocessor cards were sold in 1998, an increase of 38% over 1997, with 45% of them GSM cards. Memory cards released totalled 906 million and included a bulky volume of prepaid telephone cards.

Banking applications, GSM SIM cards and yet again public telephone cards mainly contributed to the growing issue of Smart Cards. But, according to Eurosmart, 1999 could be a turning point in the industry with memory cards losing ground (+14% growth compared to 1997) and microprocessor cards taking off (+50% growth). In total 1.4 billion Smart Cards are expected to be shipped in 1999 with a slowdown in the yearly growth at 21%.

If the allocation of application markets looks set to change in 1999, the markets geographic distribution should remain unchanged with its strong European Smart Card base and a continuing increase in Asia-Pacific. China also looks strong with some major operations and promising prospects with its entrance into the World Trade Organisation; and the boom in Southern and Central America shows no sign of stopping. The North American market will remain the black sheep showing little interest in the technology.

“North America is a cheque society with 225 cheques written by each American a year against 114 credit card transactions. It is also a credit society,” says Eurosmart Chairman Lutz Martiny.

The US’ notorious lack of acquaintance with the device is also likely to impact on the use of Smart Cards on the Internet since 56.5% of all Web surfers at the end of 1998 resided in North America according to eStats.

Eurosmart figures are simple estimates which do not correspond to actual card shipments. Such information is kept shrouded in secrecy by the association members. Lutz Martiny is well aware of this weakness and intends to remedy it by asking every member to disclose its sales figures to an entrusted lawyer who would synthetise and summarise them in confidence. The procedure needs to be agreed on and could be in place for next year.

Regrettably the association is also cagey about generating statistics on the value of the market. Its silence might signal the impossibility of reaching a consensus amongst the members.

<table>
<thead>
<tr>
<th>Shipments 1998</th>
<th>Memory</th>
<th>Microprocessor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banking</td>
<td>1</td>
<td>72</td>
</tr>
<tr>
<td>Healthcare</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Telecom</td>
<td>820</td>
<td>110</td>
</tr>
<tr>
<td>Transport</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Pay TV/IT</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>Others</td>
<td>55</td>
<td>20</td>
</tr>
<tr>
<td>Total 1988</td>
<td>906</td>
<td>248</td>
</tr>
<tr>
<td>Total 1997</td>
<td>720</td>
<td>180</td>
</tr>
<tr>
<td>Growth</td>
<td>+26%</td>
<td>+38%</td>
</tr>
<tr>
<td>Total 1998</td>
<td>1,154 b (78% mem 22% micro)</td>
<td></td>
</tr>
<tr>
<td>Total 1997</td>
<td>900 m  (80% mem 20% micro)</td>
<td></td>
</tr>
<tr>
<td>Growth vs 1997</td>
<td>+28%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shipments 1999</th>
<th>Forecasts</th>
<th>Forecasts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>115</td>
<td>Microprocessor</td>
</tr>
<tr>
<td>Banking</td>
<td>-</td>
<td>115</td>
</tr>
<tr>
<td>Healthcare</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Telecom</td>
<td>910</td>
<td>160</td>
</tr>
<tr>
<td>Transport</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Pay TV/IT</td>
<td>-</td>
<td>38</td>
</tr>
<tr>
<td>Others</td>
<td>67</td>
<td>28</td>
</tr>
<tr>
<td>Total 1999</td>
<td>1027</td>
<td>371</td>
</tr>
<tr>
<td>Total 1998</td>
<td>906</td>
<td>248</td>
</tr>
<tr>
<td>Growth vs 1997</td>
<td>+14%</td>
<td>+50%</td>
</tr>
<tr>
<td>Total 1999</td>
<td>1,398 b (73% mem 27% micro)</td>
<td></td>
</tr>
<tr>
<td>Total 1998</td>
<td>1,154 b (78% mem 22% micro)</td>
<td></td>
</tr>
<tr>
<td>Growth vs 98</td>
<td>+21%</td>
<td></td>
</tr>
</tbody>
</table>
Virgin Mobile Launched in UK

The Virgin group has ventured into the buoyant UK mobile phone market by partnering with One2One, the UK operator about to be taken over by Deutsche Telekom. The £100 million joint venture claims to shake up the wireless telecommunication market in offering cheaper calls, no line rental and simple pricing structure. Heavy users could save up to £200 a year says Virgin.

The launch was “peculiar” to say the least with Richard Branson surrounded by six naked models in Leicester Square, central London. This classic Virgin-style public relations exercise caught the media attention, infuriated the police, a women’s rights association and Charles Dunstone, Managing Director of Carphone Warehouse who claimed that the Virgin offer was disappointing and “no better than others.”

Virgin and business partner One2One expect to sell 850,000 phones by March 2000 and grab 6% of market share. On the day of launching, more than 2,000 people had already subscribed to the service.

Called Virgin Mobile, the service uses a Mobile Advanced Wireless Technology platform supporting multiple applications. This communications infrastructure interacts with a SIM card and offers Value Added Services (information on demand, special prices on other Virgin products), plus over-the-phone e-mail.

The platform has been designed by Gemplus as part of a year-long consultancy and software development process. The GemXplore 32Kb SIM card is activated by a SIM Tool Kit that runs three applications: including a scroll down menu to access the standard or extra services, a Short Message Service to query credit left, and three thresholds for tarification.

Virgin says that its SIM cards will soon be enabled to allow mobile phone users to access the Internet.

Contact
- Ken Ross Brodeur A Plus
  · +44 (0)1753 790700
  · kross@brodeuraplus.com

Amino Support for MULTOS

Amino Communications, designer of low-cost network appliances that deliver on-line services, now supports the MULTOS Smart Card technology across all market sectors. The appliances are based on Amino’s patent-pending IntAct architecture. Designs range from kiosks, set-top boxes and Video-on-Demand terminals to network computers, security systems and ATMs.

“People can use the same Smart Card in different network appliances to search for information, pick up their e-mail, access secure areas, book travel or buy goods using a variety of payment instruments,” said Martyn Gilbert, Managing Director of Amino Communications.

“Businesses deploying network appliances across their organisation or around public venues such as hotels, hospitals and shopping malls can now build totally integrated systems,” he said.

Contact
- David Dickin Amino Communications
  · +44 (0)1954 260027
  · ddickin@aminocom.com

Medicard for People “At Risk”

ORGA Card Systems and EMR Medicard have launched the Medicard which holds medical information of people deemed to be “at risk,” such as those with diabetes, epilepsy, or heart related problems, as well as people with allergies and special needs.

The ORGA Smart Card stores the user’s name and ID number as well as vital medical details including allergies, medication and specific health problems. Ambulance crews and accident and emergency staff will be equipped initially with ORGA “Handy” Smart Card readers to access this information. These will be replaced within six months by larger desk mounted readers permanently attached to a printer.

The scheme is funded by EMR Medicard and its subscribers and the equipment is provided free of charge. Subscribers pay £28.50 for the first year and £18 per year thereafter.

The scheme is being launched in Gloucestershire and at Russells Hall Hospital in Dudley. Accident and Emergency Departments in Hereford & Worcester, Warwickshire and Bristol will join the scheme in January.

Contact
- Scott Allen ORGA Card Systems
  · +44 (0)118 377 6000
  · sallen@orga.co.uk
Cartes 99 Show in Paris

Sesames 99 Awards

The Winners for the Best Applications were:

Transportation
ASK for GTML (Generic Transport Mask) designed to meet the requirements of secure multi-modal ticketing in automatic fare collection systems.

Contact
Xavier Bon ASK
☎ +33 (0)4 97 21 40 00
✉ xb@ask.fr

Banking and Finance
Proton World and Gemplus for the CEPS Compliant Proton Electronic Purse.

Contacts
Chris Bourne Proton World
☎ +32 2 724 5028
✉ bourne.c@protonworld.com
Rémi Medevielle Gemplus
☎ +33 (0)4 42 46 56 60
✉ remi.medevielle@gemplus.com

Loyalty
Unicom Consulting for uniLoyalty, a system for companies’ customer relationship management, universities exhibitions and other events.

Contact
Ditty Damström Unicom
☎ +358 9 525 98850
✉ ditty.damstrom@unicom.fi

GSM
Oberthur Card Systems for Mobile Commerce SIMphonIC. Developed as a new payment method for France Telecom Mobile, the application allows subscribers to securely purchase goods and services with the Motorola StarTAC D mobile phone and Carte Bancaire credit card via the GSM network.

Contact
Stéphanie de Labriolle Oberthur Card Systems
☎ +33 (0)1 41 25 28 18

Healthcare
Novacard GmbH and Zorg en Zekerheid (health insurance card issuer) for Smart Card with integrated fingertip sensor (FingerTIP from Infineon Technologies). Currently being used in a pilot scheme for patients with Parkinson’s disease (see page 234).

Contact
Wim Kuling, Zorg en Zekerheid
☎ +31 715 357504
✉ wkkuling@pe.nl

Identification/Security
Xiring for XI-SIGN, a pocket device for secured payment and digital signatures communicating wireless with any multimedia PC or any phone.

Contact
George Liberman
☎ +33 (0)1 46 23 67 40
✉ g.liverman@xiring.com

Technological Innovation
Gemplus for SMARTX technology which allows Smart Card programming to jump directly from first generation, low-level languages to modern fifth generation, high-level development environments.

Contact
Augustin Farrugia Gemplus
☎ +1 650 654 2935
✉ augustin.farrugia@gemplus.com

Sesame for the Best Application (among the winners) - Oberthur Card System for SIMphonIC.

Microsoft releases toolkit

One year on from Microsoft’s announcement that it was developing a new operating system, the company unveiled its Windows Smart Card Toolkit.

Philippe Goetschel, Microsoft’s Director, Smart Cards, said: “Microsoft is proud that within a year we have worked with key players in the Smart Card industry to transform our Windows for Smart Card operating system from a potentially intriguing technology to a credible and powerful Smart Card solution that is already being implemented around the world.

“We are especially happy to see that companies have embraced using the Windows for Smart Cards operating system in a wide variety of Smart Card applications, whether it be support for GSM SIM cards, logon for Windows 2000, Web authentication, medical record storage, or debit, credit and cash transactions.”

Microsoft now has a rapidly expanding Smart Card Associates Program with more than 50 members committed to ship Windows for Smart Card-based products.

The Microsoft Windows Smart Card Toolkit is available now at www.shop.microsoft.com

Contact
Kate Rowlands Miller/Shandwick Technologies
☎ +44 (0)171 240 8666
BT pilot program

British Telecommunications (BT) and Microsoft are launching a joint pilot program to bring one-touch remote network access from any device through Smart Card technology to 30,000 of BT’s mobile workers.

“Currently, logging on remotely can be a cumbersome, slow and expensive process for any mobile workforce,” explained Steve Brown, Head of Smart Card Development at BT.

“Smart Cards are going to be an important tool for businesses who want to exploit e-commerce and Internet opportunities. BT will become a key player in this market by partnering with other companies to provide technology and solutions.”

USB security solutions

Two new USB (Universal Serial Bus)-enabled security solutions for e-commerce were announced at the show.

Schlumberger announced Cryptoflex e-gate, the first Smart Card that simply plugs into a PC. Developed in partnership with ST Microelectronics, it will be available in mid-2000.

By providing a direct connection between the card and the computer via the USB port, it removes the major barrier to the use of Smart Cards with PCS. Cryptoflex e-gate provides a low-cost, simple to deploy security solution for organisations that need to protect sensitive information, control network access and facilitate Internet based e-commerce.

Cryptoflex e-gate plugs into the USB port supplied as standard on today’s PCS to give on-line security. A specially-designed chip which incorporates the interface electronics normally resident in a traditional Smart Card reader, enables the card to connect directly with the USB, without the need for a card reader or a separate power supply. Instead, it uses a simple connector, which, says Schlumberger, dramatically reduces costs.

Cryptoflex e-gate is available in two formats. The standard ISO version is a versatile Smart Card that enhances user convenience giving consumers a single key to a host of Smart services. When used with a PC to provide secure access to Internet services, for example, the user simply puts this card into the connector, and the system recognises it as a peripheral in the same way as it recognises a mouse or other USB device. The same card can also be used in traditional Smart Card terminals.

It is also available as a small format card within a token that plugs directly into the USB port. Low cost and simple to deploy, it is aimed at organisations seeking a secure and controllable computing infrastructure for large numbers of PC users.

Cryptoflex e-gate offers DES, triple DES and RSA cryptographic capabilities and a unique on-card key generation facility combined with the RSA 1024 bit public key features.

Contacts

Libby Jordan Schlumberger Test & Transactions
  +33 (0)1 47 46 63 12
  jordan@montrouge.tt.slb.com

Aladdin and Baltimore Team

Aladdin Knowledge Systems, provider of Internet content and software security, has teamed up with Baltimore Technologies specialised in e-commerce and enterprise security solutions. As part of Baltimore’s PKIWorld partner program, Aladdin will integrate eToken with Baltimore’s Public Key Infrastructure (PKI) system, enabling digital certificates issued by UniCERT to be stored securely on Aladdin’s hardware devices.

The use of eToken provides added security and portability of digital credentials for secure e-business. Aladdin’s eToken is the first USB-based device to support PKI technology. When inserted into a USB port, an application can unlock the digital certificates securely stored on the token to provide authentication and security services.

Baltimore UniCERT is used in Public Key Infrastructure (PKI) systems to provide security for e-commerce and enterprise security systems. Using digital certificates, UniCERT provides authentication and non-repudiation facilities for services such as Secure E-mail, Internet Shopping, Secure Web Banking, On-line Trading and Virtual Private Networks.

Contacts

Tom Crowley Aladdin
  +1 847 808 0300 ext. 114
  Tom.Crowley@us.aks.com

Carol Clavin Baltimore Technologies
  +353 1 605 4399
  cclavin@baltimore.com
French bank pilot

Also announced at Cartes was the implementation of a Windows Powered Smart Card pilot with Gemplus and BRED Banque Populaire in France to offer a full authentication and security solution for business-to-business Internet commerce.

The bank will provide corporations with a comprehensive offer of Internet services to help them in their move towards a Net Economy. This range of services will be accessed through the BRED-Banque Populaire new business-to-business portal - www.cyberplusbusiness.com Gemplus is providing its GemSAFE Enterprise solution for Web authentication and digital signature.

Contact

- Judy Garziglia Miller/Shandwick Technologies
  (for Microsoft)
  ☎ +44 (0)171 950 2975
  ✉ jgarziglia@miller.shandwick.com

Java as GSM standard

Sun Microsystems announced that Java Card technology has been adopted into the GSM standard for mobile phones.

According to Sun, the combination of Java technology and the SIM Toolkit will enable service providers to simply create and securely deploy value-added services such as travel and entertainment reservations, ticketing and loyalty programs to GSM phones.

Contact

- Allison Kelley Burson-Marsteller (for Sun)
  ☎ +1 202 530 4631
  ✉ allison_kelley@was.bm.com

platform seven unveils pma

A new multiple application card management system, pma (platform management architecture) was announced by platform seven.

“platform seven’s pma is capable of automating the process of loading, deleting and changing applications across distributed multi-application card bases,” explained Graham Higgins, head of platform seven. “We see this as good news for the cardholder who is able to add new functions to a Smart Card in real time over the Internet. It is also good news for the issuer who is able to update data or keys without having to recall and reissue the cards.”

The pma supports the Open Platform specifications created by Visa for globally interoperable Smart Card systems.

Contact

- Cathy Duffield platform seven
  ☎ +44 (0)171 714 8007

Mondex GSM payment solution

Mondex International, mobile phone operator Vodafone, Smart Card manufacturer Giesecke & Devrient, and Arena Leisure, teamed up to show a new GSM payment solution for value added services.

The companies demonstrated a mobile phone equipped with in-built Smart Card reader, which allows users to make small value purchases over the European GSM network.

Contacts

- Gerry Hopkinson Mondex
  ☎ +44 (0)171 557 507
  ✉ Gerry.Hopkinson@mondex.com
- Emma Terleske Vodafone
  ☎ +44 (0)1635 673732
  ✉ Emma.terleske@vf.vodafone.co.uk
- Christian Treinies Giesecke & Devrient
  ☎ +49 89 4119 2125
  ✉ Christian.treinies@gdm.de

Hitachi launches new chip

Hitachi chose Cartes to show its new H8/3166 Smart Card microcontroller targeted at multiple financial applications such as EMV credit, debit, loyalty and certain e-purse programs. The new chip has 2K bytes of EEPROM, 256 bytes of additional EEPROM, 32K bytes of ROM and 1K byte of RAM.

Hitachi also announced its 4K bytes H8/3161, a version with a different memory configuration for financial, Healthcare and e-purse applications.

Contact

- Vince Pitt Hitachi Europe
  ☎ +44 (0)1628 585163
  ✉ +44 (0)1628 585160.

Home loading terminal

Xiring, Atos and SEME (Société Européen de Monnaie Electronique) chose Cartes to announce the X-PAD MONEO, a desktop box which enables users to reload their Moneo electronic purse cards - being piloted in Tours, France - at home.

Contact

- Rosine Mayor SEME
  ☎ +33 (0)1 42 96 46 00
  ✉ r.mayhor@group-ibc.com
Bull Unveils iSimplify!

Bull introduced the iSimplify! Card billed as the world’s first Smart Card designed to simplify and secure personal access to the Internet.

The card integrates the standard Internet Protocol and can act as a server or client. It stores each user’s Internet ID, enabling anywhere/everywhere access to personal data.

iSimplify! will be offered in two versions. One is for the personal Internet user market and the other is for the professional intranet/Internet user market.

Contact
- Catherine Vincent Bull Smart Cards & Terminals
  ☏ +33 (0) 1 39 66 42 63
  ✉ catherine.vincent@bull.net

Motorola Announces WAP Phone

Motorola announced its first WAP enabled global e-commerce phone. By combining globetrotting capability, Internet access and mobile commerce, the Motorola Timeport P7389e phone makes purchasing on the move a reality.

The GSM tri-band Motorola Timeport P7389e phone can read two Smart Cards - a SIM card and a third party electronic banking card - allowing users to purchase tickets, trade stocks, bank on the move and access useful information on the Internet.

“Our customers expect to be able to manage their world on the move, and increasingly that includes the capacity to make secure Web transactions,” said Joachim Hoffman, Director of Mobile Commerce Business, Motorola, Europe, ME&A.

The new phone incorporates a WAP 1.1 micro-browser to allow fast access to information on the Internet. The iTAP (predictive entry feature) is ideal for sending text messages; it operates on a one keystroke per letter basis and the software can predict the word you are spelling. This feature is being introduced in Europe with English, German, French, Italian and Spanish. The phone, weighing 124g allows up to 210 minutes of talk time, with a standby time of up to 150 hours. It is expected to be available in Q1 2000

Contact
- Natalie Link Motorola EMEA Personal Communications
  ☏ +44 (0)1256 790707

PubliCARD acquires Absec

PubliCARD announced that it has completed the purchase of Bangor, Northern Ireland-based Absec Ltd., a designer, manufacturer and distributor of chip-based cost recovery and cashless payment and control systems for campus environments.

This acquisition enables PubliCARD to provide chip-card products and solutions in the growing corporate, government and university campus sectors in the US, Europe and the rest of the world.

Contact
- Megan McDonnell
  ☏ mmcdonnell@environics-usa.com

Banks Trial Cardflex System

Cards Etc, the Sydney, Australian-based software and services company, announced the beta release and trial of Cardflex with National Australia Bank and Westpac Banking Corporation.

Cardflex is described as a breakthrough in the management of multi-application Smart Card programs and the banks will include stored value, loyalty and digital certificate applications in the trial.

Contact
- Katrin Kroeger Cards Etc
  ☏ +61 2 9318 1255
  ✉ press@cardsetc.com

Polaroid Smart Security Card

Polaroid Corporation Identification Systems division announced a Smart Card Security Card System for large customers and Smart Card vendors.

The new production system is based on Polaroid Security Card Systems used by more than 100 state and national governments around the world.

The system produces Smart Electronic ID cards that store digital signatures, biometrics and demographic information in the chip and have a personalised card surface with text, photos and other variable data. The systems are capable of producing from one to 50 million cards per year.

Contact
- Roy Nilson Polaroid
  ☏ +1 978 386 5335
  ✉ nilsonr@polaroid.com
**KidCard to be Launched in Norway**

Hitachi Europe is working with Norwegian marketing organisation, Safety First Company, to launch the KidCard, a Smart Card for younger people. A Europe-based transaction processing centre and a call centre will also be set up.

The KidCard will enable young people to buy goods and services both at physical points of sale and over the Internet through the use of a special low cost Smart Card reader/writer terminal.

The system will enable the user to be recognised as a young person, allow controlled usage of cash which cannot be provided by a debit or credit card, and also provide the possibility to prevent young people accessing adult material on the Internet.

It is planned to introduce the KidCard in Norway during August 2000 closely followed by the UK and then France. There are also plans to distribute the KidCard in other European countries as well as Japan and the USA during the next three years.

KidCard will incorporate a Smart Card identification system from Posten SDS Norway combined with Mondex electronic cash. Zaptronix is to provide consultancy and manufacturing services to Hitachi to produce the reader/writer in volume.

**Contact**
- Jo MacGovern Hitachi Europe
  - +44 1628 585000
  - joanna.macgovern@hitachi-eu.com

**Smart Card Security for Hotels**

Two new hotels - the 500-room Boston Logan Airport Hilton and the Wyndham Hotel in Billerica, Massachusetts, have been equipped with Smart Card operated door locks.

The system uses Computerized Security Systems’ (CSS) SAFLOK keycard door locks which are operated with Bull Smart Cards.

The cards are used by hotel employees and guests. The information stored on the keycard can be accessed and updated as needed and the cards can be programmed with time restrictions and date expirations that are detected by the lock.

Gerald Hubbard, Vice President of Marketing for Bull Smart Cards & Terminals in the US, said that Bull had taken a lead with Smart Card applications specifically for the hospitality industry and that their partnership with CSS/SAFLOK had resulted in a large number of orders for Smart Card-enabled locks at various hotels in Orlando, New York and throughout the US.

The Logan Hilton and Wyndham Hotels use the system to control entry into guest rooms by employees. The card records the date and time that an employee enters a specific room for maintenance, housekeeping or room service and is useful in resolving questions if a security concern arises. The same cards can also limit entrance into selected rooms or areas.

**Windows Powered Smart Cards**

PubliCARD announced at the Comdex Show in Las Vegas last month, that its subsidiary, Amazing Smart Card Technologies has been licensed by Microsoft to manufacture Windows Powered Smart Cards, making PubliCARD one of the first Smart Card companies in the US to sell the technology to the public.

PubliCARD’s move into this market is strengthened by chip card IC technology from Infineon Technologies for the multi-functional Smart Cards.

Richard Phillimore, Executive Vice President, said: “PubliCARD believes that Microsoft’s new operating system will set one of the main industry standards. We have adopted this operating system as a platform on which to deliver our Smart Card-based Internet applications. This places us on a more competitive level compared to other companies that are using existing proprietary and fragmented Smart Card operating systems.”

The company said its new Windows Powered Smart Cards would soon be available through Amazing’s website at www.amazingtechnologies.com.

**Contact**
- Ben Trounson Environics
  - +1 203 325 8772
  - btounson@environics-usa.com

**Contacts**
- Bill Bradley Bull
  - +1 978 294 5812
  - bill.bradley@bull.com
- Phil Wilder Computerized Security Systems
  - +1 949 722 5400
  - phil@cssmain.com
Award for Third Millennium

Third Millennium’s Template-on-a-Card security solution incorporating tssi’s Verid fingerprint reader, has won the Millennium Innovation Security Product Award promoted by Security Management Today and Security Installer.

The Template-on-a-Card system allows a user’s fingerprint template to be stored on a magnetic stripe or proximity (contactless) Smart Card. This eliminates the need to store fingerprint data on a network thus simplifying the system, enhancing security and allaying concerns about civil liberties.

The system is available in a one-piece wall mountable unit with an integrated card reader. The fingerprint template can also be stored on a contactless Smart Card where the user has a requirement for multifunction applications to be held on the same card set.

A PC software package enables users to have their templates encoded onto their ID cards along with their personal ID number. The card is presented to the reader and the fingerprint template is transferred to the verification unit for checking against the live finger. If successful, the users ID number is sent to the door control system to allow access.

Contact
Carolyn Tye tssi
+44 (0)1793 747700
cal.tye@tssi.co.uk

Pilot for Patients with Parkinson’s

A pilot scheme involving Smart Cards and biometrics for sufferers from Parkinson’s disease, received the SESAME Best Application in Healthcare Award at the Cartes Show in Paris, France, last month (see page 229). Earlier last month the project was also awarded the National Chipcard Award 1999 of The Netherlands, a 24-carat Golden Chipcard.

The project was launched by health insurance company Zorg en Zekerheid (ZenZ) in The Netherlands, using Novacard of Germany’s Smart Cards incorporating Infineon Technologies’ FingerTIP sensor. This is the first application of FingerTIP in the public domain, and a first for the European healthcare industry. Also involved in the project was HSB Cards & Card Systems, specialists in card management and software products.

ZenZ already issues health insurance cards to its patients, but decided to take the system to a higher level in the pilot programme which enables the storage of patient information and biometric verification of the user’s identity on the same card. Between 800 to 1,000 patients with Parkinson’s disease are taking part in the pilot on a voluntary basis. The scheme tracks all information about their medical history with details about the course of their illness and any medications prescribed.

The card is ID1 size but thicker at one end to contain the FingerTIP sensor. Infineon believes it will eventually develop the technology to the extent that the sensor will fit in a standard card and is moving towards being able to offer the option of recording several templates on the processor chip. In the Parkinson project this would enable the patient to give his card to a relative or voluntary carer if, for example, he or she could not collect the medication personally.

The Smart Cards are issued with a portable reader, which the patient can carry with him to provide access for medical professionals to all data registered on the card. An innovative feature is that the unit software can read the patient’s medication schedule. An internal clock sends an audio signal to the patient and a visual display shows the type and quantity of medicine to be taken at that time.

On completion of the pilot, ZenZ plans to roll-out the system on a widespread basis.

Contact
Wim Kuling Zorg en Zekerheid
+31 715 357504
wwkuling@per.nl

Marcel Boogaard HSB Cards & Card Systems
+31 348 433080
info@hsb.nl

Hawaii Loyalty Program

Bull has received an order for around 200,000 CC Proton electronic purse cards from The Pathways Group which is providing Smart Cards and point-of-sale terminals for a merchant loyalty program in Hawaii. Consumers will be able to use their cards in both real and virtual e-commerce activities and collect loyalty points.

Contacts
Cheryl Saindon Pathways Group
+1 707546301
csaindon@pathwaysgroup.com

Bill Bradley Bull - Tel: +1 978 294 5812
bill Bradley@bull.com
Europe to Lead in Mobile Trading

European consumers are expected to be the first in the world to use their mobile phones to conduct trusted transactions such as trading stocks and carrying out electronic banking, says Internet security vendor Entrust Technologies Inc.

The company, which has its European headquarters in Reading, UK, revealed that it is working with partners including Nokia, Nortel Networks, Sonera and 724 Solutions to let banks, brokerage firms and other organisations securely trade with their customers over wireless communications links. Customer trials are expected to begin this month.

Entrust’s first offering will enable an e-commerce mobile application server - such as Nokia’s WAP Server - to identify itself to mobile phones and other devices, and to encrypt and decode data it shares with them.

The move comes as part of Entrust’s global products and partnerships programme to develop security solutions for GSM and Wireless Application Protocol (WAP) devices.

Entrust Technologies’ CEO John Ryan, said: “Europe has from the start led the way in mobile telephony and data and we fully expect secure mobile wireless trading to take off first right here.”

Contact

Duncan Reid Entrust Technologies UK
+44 (0)118 953 3000
duncan.reid@entrust.com

Intel Joins PC/SC Workshop

Intel Corporation has joined the PC/SC Workshop to help drive Smart Card technology standardisation and adoption in the industry.

“Intel believes the Workgroup can help provide greater security on the Internet by standardising Smart Card application interfaces and hardware specification on the PC platform,” said Eric Arendts, Manager of Smart Card Programs, Desktop Products Group at Intel.

Other PC/SC Workgroup Members include Bull Personal Transaction Systems, Gemplus, Hewlett Packard, IBM, Microsoft Corp, Schlumberger, Siemens, Sun Microsystems and Toshiba Corp.

The PC/SC Workgroup’s Technical Committees are currently working on the PC/SC Specifications 2.0, which will be released for public review early next year.

Version 2.0 will include considerations for additional technologies, such as Smart Card readers with pinpads, and contactless cards.

www.pcscworkgroup.com

OEM card readers for Internet

Omron has introduced a Smart Card reader that provides high PC security and meets increasing demand for secure transactions over the Internet. Designed for OEM installation, the V41F reader fits into the standard 3.5 inch drive of a desktop PC.

System integrators can choose from the wide range of T=0 and T=1 processor cards currently available. Typical applications are for PC access control, as a secure replacement for PIN codes in e-commerce transactions, and for on-line banking, for example to download electronic cash onto Smart Cards.

Contact

Lee Steed Omron Electronics
+44 (0)181 450 4646
ukcc—saleseu.omron.com

Hypercom E-purse Loader

Hypercom has introduced the HFT 916 self-service terminal which enables consumers to transfer funds from cheque or savings accounts into their electronic purse cards.

The new terminal looks like an ATM and can be installed at banks, in shopping malls, airports, train and bus stations and other high-traffic areas.

Jairo E. Gonzalez, Senior Executive Officer, Hypercom Corporation, said: “The terminal houses a robust metal keyboard and a Smart Card reader that are physically encapsulated. Communications links between the reader and the unit’s electronics are encryption protected, and sensors can detect unauthorised access.”

Contact

Mark McMurtie Hypercom Europe
+44 (0)1483 718600
mmcmurtie@hypercom.com
Visa and SERMEPA in CEPS Test

The initial phase of a program to make Visa Cash compliant with CEPS (the Common Electronic Purse Specifications) has started and will involve tests using Visa Cash cards in Spain, Latin America and the United States.

Visa and SERMEPA will work together to enhance their Visa Cash cards and systems, enabling member banks to begin migrating existing Visa Cash programs to CEPS in 2001. They are working with 13 international vendors and suppliers to develop the Visa Cash CEPS compliant cards and systems for the test.

The goal is to enable cardholders to use their Visa Cash cards in any point-of-sale terminal and load value at any loading device with the Visa Cash mark.

Other systems providers and vendors, including Proton World, are currently developing CEPS compliant Visa Cash components which will be used in new Visa Cash programs.

Visa says all existing Visa Cash programs will eventually migrate to CEPS compliant technology.

Contact
- Colin Baptie Visa International
  - +1 650 432 4671
  - cbaptie@visa.com

Entrust unveils Enhanced PKI

Entrust Technologies has announced the commercial availability of its flagship Entrust/PKI 5.0 software and Desktop Solutions 5.0. Entrust/Roaming, a solution for enabling mobile Entrust public-key infrastructure (PKI) users and the updated Entrust/Toolkit, a family of toolkits for developers, are also available now.

“These 5.0 releases provide customers with enhanced functionality. We focused on lowering the cost of user registration and administration, improving user mobility, and implementing new policy management and security capabilities that will help us deliver affordable, easy-to-use solutions to customers,” said Bob Heard, Senior Vice President, Marketing and Business Development.

Contact
- Duncan Reid Entrust Technologies UK
  - +44 (0)118 953 3000
  - duncan.reid@entrust.com

Rainbow and KyberPASS Partner

Rainbow Technologies and KyberPASS Corporation are to build integrated security solutions for Internet and e-commerce using two-factor authentication and Public Key Infrastructure (PKI).

The combination of Rainbow’s iKey USB-based cryptographic token and KyberPASS Security Server allows businesses to implement secure two-factor authentication and (PKI) without changing their core business information systems and preserving their existing IT investment.

Ron Walker, President and CEO, KyberPASS, explained: “This agreement will allow our customers to distribute mobile credentials to their users allowing them direct access to their network and proprietary information.”

Contact
- Dan Chmielewski Rainbow Technologies
  - +1 949 450 7377
  - dchm@rainbow.com
- Joanne LaBossiere KyberPASS Corp
  - (800) 845-1140 x227
  - jlabossiere@kyberpass.com

Digital Courier and Mondex Team

Mondex International and Digital Courier Technologies have announced an agreement to collaborate on a strategic worldwide alliance providing for the integration of Mondex electronic cash payment capabilities with Digital Courier’s Internet payment products and services.

Digital Courier is installing a payment gateway in the UK and US that will “Internet enable” Mondex electronic cash. The gateway will allow Digital Courier to act as a currency exchange or Bureau de Change facility for value loading in multiple currencies.

Mondex Smart Cards allow users to carry up to five different currencies on their card at any one time.

Contacts
- Eileen Iguchi Digital Courier Technologies
  - Tel +1 435 655 3617
  - eiguchi@dcourier.com
- Gerry Hopkinson Mondex International
  - +44 (0)171 557 5016
  - gerry.hopkinson@mondex.com
Briefing notes on Multi-Application Smart Cards - Part 2

Last month we described the concept of a multi-application Smart Card and we now need to introduce some detail that will allow us to understand the approach taken to use the major platforms of JavaCard, Multos and Windows for Smart Cards (WfSC). In particular we will look at the Open Platform as defined by Visa for specifying an application independent card management standard.

We will start by defining two more layers in the multi-application chip architecture as shown in figure 4. Here we have introduced two new concepts, a security kernel and a security domain manager. The security kernel manages security resources provided by the chip platform whilst the security domain manager looks after the security services provided by the platform to the application. The virtual machine must correctly map the operation between the security domain manager and the security kernel thereby ensuring the necessary segregation between the applications. It is clear that the security domain manager and the security kernel are inextricably linked.

Let us look at the properties necessary to achieve a secure multi-application environment:

- Secure Application load, enable, delete and suspend
- Secure security domain segregation
- Secure memory management unit
- Secure cryptographic implementation
- Secure Input/output (I/O)
- Secure application segregation

**Secure Application load, enable, delete and suspend**

An application will include code and data where it is necessary to ensure appropriate data confidentiality (e.g. cryptographic keys), data integrity and source authentication. Some load modules will be concerned with the platform including the security domain manager and upgrade modules for the run time environment or the security kernel. It is clear that these operations must be controlled by the platform owner and are therefore subject to his security processes.

In general, some application data (e.g. crypto keys) will be enciphered and the total load module will be cryptographically signed by some public key algorithm such as RSA or authenticated by a symmetric algorithm such as DES. The enable, delete and suspend commands should be similarly protected.

**Secure Security Domain Segregation**

There are a number of issues to consider here. In the first instance we will assume that the implementation of the cryptographic algorithms form part of the security kernel. This is likely to be the case on performance grounds at the very least. Applications should normally preserve their own cryptographic key space. In this sense the security domain manager acts as an application with its own security keys whilst the security kernel would also operate its own security keys. In addition to preserving these separate key domains we also need to control access by applications to the cryptographic algorithms. Some algorithms may be proprietary and only authorised for use by a particular application (e.g. GSM). Even though we are entering a period of change in terms of export controls on cryptographic implementations it may still be useful to be able to control access by applications to the cryptography provided by the security kernel.

**Secure Memory Management Unit**

The integrity of the data stored in chip memory is fundamental to the overall security offered by the platform. Applications must be prevented from interfering with each others data storage. It is equally important to ensure that data integrity is maintained against any deliberate or accidental chip malfunction. Pulling the card out of the reader during an EEPROM write operation (tearing) is just like turning the power off the computer while it is writing to the hard disk. Sophisticated software techniques are necessary to recover such data corruption.

**Secure Cryptographic Implementation**

The implementation of cryptographic algorithms has been much in the news over the last year due to the work of Paul Kocher in analysing the leakage properties of Smart Card chips. In particular he has shown that by analysing the chip power signal using a technique called DPA (Differential Power Analysis) he was able to determine the secret cryptographic key used by the DES implementation in the chip. His technique applies equally well to other
cryptographic algorithms. It is probably not possible to eliminate the leakage characteristics of the chip and accordingly the programmer of cryptographic algorithms must use defensive techniques to mask the underlying operation that would lead to a determination of the keys. Another attack on the implementation of cryptographic functions, in this case the timing of such operations, has also been exposed by Paul Kocher. It has also been shown by other experts in the field that an induced failure in the execution of cryptographic algorithms may lead to the secret keys being revealed.

Secure Input/Output (I/O)

There is also another problem with the software implementation in the chip relating to the serial I/O port. If you can induce a malfunction in the operation of the chip then it may end up revealing security sensitive information in a directly readable form. Even more serious is a programming error that transmits unauthorised data in response to an authorised request.

Secure Application Segregation

Perhaps the fundamental requirement of a multi-application card is that the applications are prevented from interfering with each other. It is one of the main reasons for using a virtual machine run time environment where no application ever obtains direct access to the chip resources. All requests for memory access, I/O and cryptographic routines are handled by the run time environment which deals directly with the security kernel. Clearly the correct implementation of the platform software, security...
domain manager, virtual machine run time environment and the security kernel are necessary to meet this requirement.

Visa has been instrumental in delivering specifications for Smart Cards over the last few years. The EMV specification developed in conjunction with MasterCard and Europay formed the basis for financial applications on Smart Cards. More recently Visa developed the VOP (Visa Open Platform) standards for the use of financial applications on multi-application Smart Cards. This has been generalised to form the Open Platform (OP) standard for multi-application cards that is designed to be a hardware neutral, vendor neutral, application independent card management standard. This new standard has been designed to provide a common infrastructure for multi-application cards with a common security and card management architecture. VOP now defines an implementation of the OP for Visa financial applications.

To be continued next Month

D B Everett

Smart Card News Brings Another Subscriber First

From January 2000, Smart Card News is supplying Smart Cards on the front of newsletters to all full subscribers. Each month our subscribers will receive an unusual and sometimes limited edition Smart Card to start their own card collection.

After viewing the trading of Smart Cards from briefcases whilst on holiday in Greece (our MD never stops working) Patsy Everett decided that our subscribers deserved more than just news. She wanted to offer them something unique. So this is it! The Smart Card News Collectors Corner. We hope that you enjoy collecting the cards over the year 2000.

Subscribers to Smart Card News can now start their own Collectors Corner. Companies such as Schlumberger, Incard and ORGA will be supplying our subscribers with a Smart Card each month for the year 2000. From January 2000 you will receive a Smart Card to keep on the front of your monthly newsletter. Another first for the leading Smart Card publication, Smart Card News.
ORGA – Smart Solutions for the Smart Card Market.

The smart card industry is continuing its rapid growth. To be a leading supplier within the smart card market you have to be a truly international organisation.

ORGA Card Systems, a founder of the smart card industry, offers the complete product range to a number of markets including; GSM, Communications, Banking, Retail, Loyalty, Health, Leisure, ID and Access Control.

To be at the forefront of these smart card markets talk to ORGA.

For more information visit us at: www.orga.co.uk