Securing the Nation's Borders
A Practical and Economical Approach

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Introduction

Recent US legislation, such as the Border Security Act[1], has mandated that foreigners arriving at US borders will carry a secure identity document capable of storing automatically verifiable biometrics. These measures are intended to provide substantial improvements to the security of the United States in the shortest possible time frame, and yet considerable obstacles exist for rapid delivery of this program if it must proceed from first principles with different technologies.

It is perhaps a little known fact that the US has developed and is already issuing a suitable document (card) credential to foreign nationals, at the rate of 4 million per year, with total issuances to date numbering approximately 14 million. These advanced technology cards and their underlying capabilities, already proven in usage by the US government, can readily serve as the instrument for new Border Security initiatives in a much shorter time frame than would otherwise be possible. In addition, all of the requirements of the new approaches to Border Security can be accommodated at the highest level without compromise.

This paper describes how the simple expedient of leveraging the existing investment of the US government in this card technology infrastructure, and scaling up the existing issuance system, is the most efficient and rapid path to ensuring secure borders for our nation.

Requirements for Border Security

To enhance US Border Security to the high levels stipulated by the US government, the identity document carried by visiting foreigners must meet stringent requirements for physical security and data security normally expected of such documents for international identity verification, including the following elements:

- ***Counterfeit resistance***, to ensure a high probability of detection of phony or counterfeit credentials; and

- ***Tamper resistance***, to ensure a high probability of detection with unlawfully-altered official documents.

The robustness of these documents notably applies to images (photos, etc.) as well as data, and this data includes both inked versions for viewing by human operators as well

[1] The Enhanced Border Security and Visa Entry Reform Act of 2002

as digital data for automated authentication devices. This latter point is extremely significant. Although the vast majority (an estimated 95%) of identification credentials are still inspected visually by human operators, *machine-based authentication* must quickly grow in significance in order to implement desired new Border Security initiatives. Hence, the following additional requirements for Border Security are also now imperative:

- ***Resistance to counterfeit or alteration of electronic data***, with a high probability of detection of these activities by automated authentication means alone; and

- ***Reliable machine authentication of the holder,*** namely strong means of tying the legitimate document to the legitimate holder. This involves biometric ID verification.

The above composite requirements are actually not new, nor difficult to achieve. The US government, through the INS and the Department of State, has already specified and developed solutions with applications for permanent resident cards and officially-approved Mexican border crossing cards. These types of credentials and the advanced technology behind them, which are already proven, can readily form the basis for the new US Border Security requirements. The US government has issued more than 14 million of these cards to foreign nationals to date, and the technology is already being adopted by other countries such as Canada. The resulting benefits to the heightened US Border Security requirements are readily available.

The next section describes further details of the advantages to be gained by the US government in the use of this already-proven technology.

The LaserCard Secure ID Credential

When seeking a secure technology for the current generation of Permanent Resident Card and Border Crossing Card, the INS and the Department of State, after considerable research, selected the Optical Memory Card supplied by LaserCard Systems Corporation. This card technology was chosen based on a number of significant parameters:

- ***Extensive and inherent security features***, which incorporate physical security, strong tamper resistance and detection, and the unique nature of the data recording method which assures non-volatile data encoding, namely data encoding only once per storage location with no means available for anyone to change the data in that area thereafter;

- ***Strong visual authentication***, which in the INS/State design provides photo images on the card face as well as in the optical stripe, effectively eliminating any opportunity for tampering with or wholesale counterfeiting of the card;

- ***Expansive digital memory capacity***, permitting very large amounts of data to be digitally stored (especially when compared to the volatile and limited memory

area of the much more costly smart cards). This is crucial for present and future requirements in Border Security where additional biometrics and security data might need to be recorded; and

- ***Unparalleled durability,*** where cards issued by INS/State for over four years now have proven their durability in real life situations.

The fact that these cards are being issued under contract in secure facilities also indicates that the program could be readily expanded for Border Security requirements without major new infrastructure investments by the US government. In short***, these cards and the technology behind them fully meet and exceed the new Border Security requirements of the US government and offer a path for rapid deployment as well.***

Program Details

To date, the INS has issued more than seven million optical memory-based (LaserCard) Permanent Resident Cards ("Green Cards"), and the Department of State has issued more than seven million optical memory-based Laser Visas ("Border Crossing Cards") to Mexican citizens who frequently visit the US. In the latter application, Mexican Border Crossing cards, the State Department has proven that:

a) a visitor's visa can exist in machine-readable card form, and

b) the optical card solution or Laser Visa serves very well as a credential for this purpose.

All of these 14 million + cards have been personalized in secure, efficient, private sector-run issuance facilities which can be scaled up as needed to meet expanding demand.

Additional attributes and aspects of these programs of interest to the US government in considering options for its new Border Security requirements include the following:

1. ***Inspection.*** Both the Permanent Resident and Laser Visa cards exhibit exceptionally strong visual authentication features. This recognizes today's reality where more than 95% of credentials are authenticated only by visual inspection. This will have to change for enhanced Border Security requirements, and optical memory's ultimate strength lies in its secure machine authentication and its inherent data security. Devices exist which can authenticate the card electronically while simultaneously reading and displaying data from the card on an inspection workstation for human inspection confirmation and back-up. Additional data can be read at the same time for further identity verification via biometric templates that may be used now or in the future. In other words, *the LaserCard® optical memory card is ideally suited to be used in present circumstances as well as in the future as a*

visa mechanism for the US enhanced Border Security program.

2. ***Inspection Devices and Capabilities.*** The secure Field Reader developed for the INS and State programs can complete an ID verification transaction in less than seven seconds (a typical border inspection interview lasts 30-40 seconds). This transaction includes securely verifying the card's authenticity, reading from the card's memory, displaying the cardholder's facial and fingerprint image, reading the cardholder's fingerprint template from the card, and verifying (or denying) the cardholder's ID.

   Although to date no Field Readers have been deployed, the INS has a current program in place to deploy the first 30 systems on the Southwest border in the summer of 2002. This program includes biometric verification using the data stored on more than seven million Laser Visas issued to date to Mexican citizens who frequently cross our borders.

3. ***The Canadian Program.*** In June, 2002, the Canadian government started issuing an optical memory-based LaserCard Permanent Resident Card (PRC), the equivalent of the US Green Card. As a specific component of the US/Canada Border Harmonization Accord, the new Canadian PRC will be interoperable with the US Green Cards and Laser Visas while securely protecting each country's private, secure memory zone. Following the implementation of the PRC, the Canadian Government will very likely expand the program to issue Passport Cards as companion credentials to the Canadian passport for its citizens, as the easiest and most compatible means of complying with the new Border Security Act; such optical-memory based Passport Cards have been an objective of the Canadian Passport Office for many years.

4. ***The Visa Waiver Program.*** Interoperability of the Canadian optical memory LaserCards with US cards is achieved as described by ICAO[2] draft standards. Canada, with its PRC and Passport Cards, will comply with the US requirements of the Border Security Act for continuation in the Visa Waiver Program, which specifically refers to ICAO standards for these purposes[3]. The Canadian program, therefore, can serve as a model to other countries in this regard, greatly facilitating the implementation of the Border Security Act between Canada and the US.

5. ***North America.*** At current planned issuance rates, by the end of 2003, the NAFTA region population of optical memory-based immigration and border crossing cards will be in excess of 20 million. Within existing plans, many major border entry points used by Mexican and Canadian visitors will be equipped with secure Field Readers by the end of 2003.

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[2] ICAO, the International Civil Aviation Organization, is the international standards authority for Machine Readable Travel Documents

[3] Section 303 (c) (1) *Certification Requirements*

With the significance of border crossing volumes from Canada and Mexico, it is very likely that these existing card programs will be used to form the basis for the forthcoming implementation of new Border Security measures in the NAFTA territory. In this eventuality, major US border points will have to be equipped with devices to read, authenticate, and verify the holder's biometric data using LaserCard credentials.

These facilities could be used by many other countries and visa holders, saving the US a great deal of money, and simplifying equipment deployment and procedures at border points significantly. ***It is logical, therefore, and economical, for the US government to:***

a) Recommend these card technologies to countries who wish to continue involvement in the Visa Waiver Program, in a manner analogous to the Canadian program; and

b) Issue visas in the form of optical memory LaserCards from US missions overseas for citizens of non-visa waiver countries.

Conclusion

This paper has attempted to explain the excellent potential demonstrated by optical – memory-based LaserCards for the rapid and economical deployment of the new Border Security Act and other legislation. This potential is based not only on the strength of the technology, and the ability to build on what the US government has done to date in this area, but also on the desire to avoid proliferation of different card and document reading devices at the border.

To summarize, we feel that optical memory LaserCards are the preferred choice for the following reasons:

1. They are ideally suited to the task, combining rigorous physical security features and durability with highly secure digital data storage technologies that do not permit key ID data to be tampered with;

2. In the US design version (INS/State) they contain the facial image biometric of the holder for visual inspections on both the front and back of the card as well as in the electronic data storage area;

3. They have been proven in real use situations in the United States and by the US government;

4. They have been manufactured and issued under contract in secure facilities for more than three years, and these facilities could be ramped up in short order for implementation of the Border Security Act requirements;

5. They contain extensive non-volatile data storage areas for incorporation of one or more biometrics and other data fields that may be required in the future;

6. They will be deployed in ICAO-standard and interoperable formats by Canada in the near future, and this could readily serve as the basis for widespread visa issuance and Visa Waiver compliance internationally;

7. The US border will be equipped with readers for such optical memory cards, and no other special devices need be provided if other states, and the US in its overseas visa issuance activities, use the same card technology; and

8. Given the existing infrastructure for manufacture and issuance, they represent the most rapid and economical path for implementation of the Border Security Act.

LaserCard Systems Corporation welcomes input and queries from any reader on these matters. Please refer comments and questions to:

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