

The author(s) shown below used Federal funds provided by the U.S. Department of Justice and prepared the following final report:

Document Title: AISLE II: Accelerated Information Sharing for Law Enforcement: Final Report

Author(s): Nlets

Document No.: 219551

Date Received: August 2007

Award Number: 2002-MU-MU-K005

This report has not been published by the U.S. Department of Justice. To provide better customer service, NCJRS has made this Federally-funded grant final report available electronically in addition to traditional paper copies.

Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.



National Institute of Justice Grant Number

AISLE II: Accelerated Information Sharing for Law Enforcement

Final Report



AISLE II: Accelerated Information Sharing for Law Enforcement

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY - 3 -

 A. AISLE Program - 3 -

 B. Goals and Objectives - 4 -

 C. Alignment with FBI CJIS - 7 -

 D. Justice Reference Architecture - 8 -

 E. Nlets Background - 8 -

II. PROJECT DESIGN, DATA AND METHODS - 10 -

 A. Nlets infrastructure..... - 10 -

 1. *Background* - 10 -

 2. *Project Design*..... - 11 -

 3. *Project Data*..... - 11 -

 4. *Project Methods* - 13 -

 5. *Security*..... - 14 -

 B. New XML subscribers - 14 -

 1. *Background* - 14 -

 2. *Project Design*..... - 15 -

 3. *Project Data*..... - 17 -

 4. *Project Methods* - 17 -

 5. *Security*..... - 17 -

 C. Electronic Mail - 18 -

 1. *Background* - 18 -

 2. *Project Design*..... - 18 -

 3. *Project Data*..... - 19 -

 4. *Project Methods* - 19 -

 5. *Security*..... - 20 -

III. PRESENTATION OF FINDINGS - 21 -

 A. Nlets infrastructure..... - 21 -

 1. *Dissemination Strategy* - 21 -

 2. *Performance* - 21 -

AISLE II: Accelerated Information Sharing for Law Enforcement

B. New XML subscribers - 21 -

 1. *Preliminary Findings* - 22 -

 2. *Dissemination Strategy* - 22 -

 3. *Performance* - 22 -

C. Electronic Mail - 22 -

 1. *Preliminary Findings* - 22 -

 2. *Dissemination Strategy* - 24 -

IV. IMPLICATIONS FOR POLICY AND PRACTICE - 25 -

TABLE OF FIGURES

Figure 1 AISLE Program - 3 -

Figure 2 AISLE II Proposed vs. Implemented - 5 -

Figure 3 Nlets Web Services - 9 -

AISLE II: Accelerated Information Sharing for Law Enforcement

I. EXECUTIVE SUMMARY

A. AISLE Program

In September 2000, the Nlets Technical and Operations Committee approved the following resolution.

"Resolved that [Nlets] recommends XML as the future for all new Nlets transactions ..."

This bold step was the start of Nlets leadership in the deployment of XML and web services on a national scale. The AISLE program was the first formal initiative toward the realization of resolution.

The AISLE program defined three major steps that serve as a model for large scale XML web services deployment.

- ◆ Phase 1 – Provide capability to exchange XML Web services with legacy systems for the initial early adopter
- ◆ Phase 2 – Add more early adopters; allow for XML exchanges
- ◆ Phase 3 – Provide version upgrade broker services; support for GJXDM and NIEM

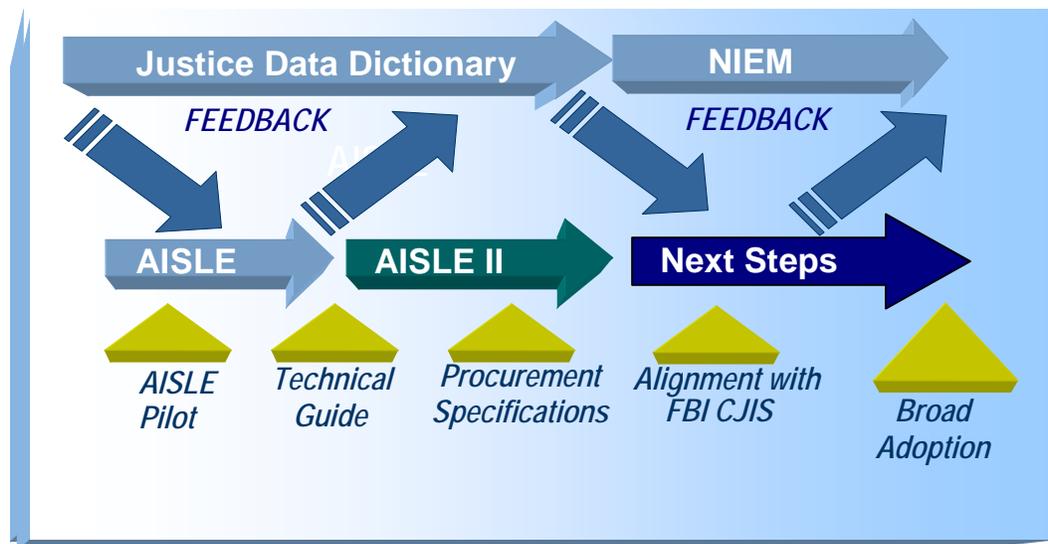


Figure 1 AISLE Program

The initial AISLE Project demonstrated the viability of XML Web Services as new enabling technology for the transmission and receipt of Nlets query/response transactions. The primary focus was to create

AISLE II: Accelerated Information Sharing for Law Enforcement

standards and a framework for interoperability between legacy systems with text data formats and open standards with XML data format and structure. The AISLE II Project will introduce the exchange of XML transactions and messages between states.

Creating data standards is a difficult and lengthy process, and there is a natural tendency to defer development projects until standards are complete. By contrast, introducing new technology using legacy data can occur relatively quickly, particularly if the new and legacy technologies are interoperable. In the initial AISLE Project, fully bi-directional transformations between XML and legacy formats were provided. Using interim XML data standard specifications, web services were successfully deployed in parallel with the continuing definition of XML standards. Tangible results were immediately provided. The AISLE Project provided the additional advantage of incorporating the benefit of operational experience into the standards process. Collectively, these implementation strategies were principal reasons for the success of the AISLE Project.

B. Goals and Objectives

The overarching goal of the AISLE II project is to deploy XML and web services to additional state and demonstrate the effective of information exchange using XML. The initial AISLE project provided full legacy interoperability with the initial XML web service adopter, Wisconsin. AISLE II realizes the benefits of XML by providing for the receipt of information in XML format.

Because of the changes in funding and state resource availability during the grant application cycle, a number of changes occurred between the proposed objectives and those being implemented. The chart below lists the objectives of the AISLE II project and the current implementation efforts.

AISLE II: Accelerated Information Sharing for Law Enforcement

Goal		
XML specifications	Nlets Response XML specifications Alignment with GJXDM 3.0	Comprehensive schemas GJXDM 3.0.3 compliance
Nlets infrastructure	Data mining enhancements	Nlets computing infrastructure improvements and data mining infrastructure Interpol database access
Electronic mail	e-mail interoperability with Nlets messaging	e-mail interoperability with Nlets messaging
New XML subscribers	New York, Kansas	New York, Delaware, Iowa, Maine, Georgia (self funded) XML training for state staff Outreach
Additional capabilities	Web services security Image exchange capabilities Voice over IP	Deferred due to partial funding

Figure 2 AISLE II Proposed vs. Implemented

The definition of XML specifications is a key AISLE II product. Nlets determined that the need for formal schemas for the existing Nlets XML specifications offered a greater benefit than completing the definition of XML formats for Nlets responses. Schemas were increasingly being required by states as they implemented the Nlets XML specifications. Under the CANDLE grant, Nlets has completed the definition of XML for vehicle and driver transactions. Nlets has defined all existing specifications in compliance with GJXDM 3.0.3.

Nlets planned infrastructure improvements under the AISLE II project are very significant. Under the AISLE II grant, Nlets is performing a number of improvements to the Nlets XML Message Router (XMR) and the Nlets transaction log repository. The Random Access to Nlets Data (RAND) capability, which

AISLE II: Accelerated Information Sharing for Law Enforcement

provides data mining services, will directly benefit from these improvements. The improvements include clustering, faster hardware and mirroring to the disaster recovery system which can serve as the data mart.

Nlets is also providing the capability to access Interpol data. This new service will be limited to authorized personnel. Authorized Nlets users will be able to query person data through the Interpol Automated Search Facility. This capability will be particularly beneficial to state fusion centers.

As the AISLE II Project "model state" Wisconsin is moving beyond the initial Web Services implementation to develop a messaging service using the Internet standard Simple Mail Transport Protocol (SMTP) and industry standard electronic mail. As proposed, the AISLE II project team is implementing an electronic mail capability that will enable transmission of Nlets administrative messages in either XML or legacy format through the Nlets network. The project team will rely on the Nlets members' (Wisconsin's for the proof of concept) electronic mail system for the email infrastructure required to deliver a message to the end user.

Wisconsin serves as the "anchor" state to provide for the interstate exchange of messages. The AISLE grant efforts in Wisconsin provided an important operational XML web services framework. Several additional states, including New York, Delaware, Iowa and Maine, are implemented XML web services using AISLE II funding. New York is implementing AISLE II XML web services as part of a major modernization of the New York State Police Information Network (NYSPIN). Nlets is providing consulting services to insure that the NYSPIN project is able to fully implement XML web services. New York was the first state to implement the CANDLE XML specifications and New York is fully operational with CANDLE services today. In addition, the state of Georgia has implemented AISLE XML web services as a part of their state funded system modernization. Delaware, Iowa and Maine are implementing various degrees of AISLE II XML using grant funding. The viability of large scale XML and web service deployment has now been proven operationally. Nlets has provided AISLE II states with engineering services as well as XML training and outreach services. Engineering funding has been provided to state vendors that have multiple

AISLE II: Accelerated Information Sharing for Law Enforcement

installations with the caveat that the XML web service technology be incorporated into their products and made widely available under existing software maintenance agreements.

The AISLE II grant application was partially funded which resulted in deferring efforts on certain new capabilities. In particular, web services security, image exchange services and Voice-over-IP were deferred due to funding. Since the participation of the state of Kansas was based upon the security expertise of the Kansas staff, it was determined that Kansas would be deferred until the security capabilities were implemented.

The key products of this effort are capability to exchange XML transactions between states, the advancement of the Nlets XML specifications, the ability to scale XML web services, and the use of standard electronic mail system to send/receive administrative message through the Nlets network. The audience for the AISLE II products is the entire criminal justice community, as it will reap the benefits of the new methods and value of the AISLE II Project concepts and technology advancements.

C. Alignment with FBI CJIS

Nlets and the FBI CJIS Division are working together to align both data and exchange specifications. The formal basis for the alignment initiative is the December 2004 APB motion/directive so directing. One of the most important questions is the underlying GJXDM/NIEM version to be used for the NCIC specifications.

While Nlets currently supports GJXDM 3.0.3, this version will be replaced by GJXDM 3.1 in the coming months. GJXDM 3.1 is the basis for the National Information Exchange Model (NIEM) release. The CJIS Division is proceeding with the use of GJXDM 3.0.3 having based their work on the earlier 3.0.3 XML schemas developed by Wisconsin and presumably to align with Nlets. Because the development and deployment cycles of the FBI CJIS division are so long, there is concern that a 3.0.3 NCIC implementation would become available well after 3.1 is released and become too entrenched to allow change for several

AISLE II: Accelerated Information Sharing for Law Enforcement

years. This comes at a time when the federal government is pushing for the adoption and use of NIEM. Nlets has the technical resources to support 3.1 when appropriate. I know that Gerry will coordinate directly with you if he is concerned about the direction of the NCIC XML effort.

Nlets and FBI CJIS have made progress with the alignment of technical specifications for the use of IBM MQ for communications. However, there is a considerable gap on the subject of web services. Nlets has committed to the use of web services as the primary communications protocol. The FBI CJIS division has not published a position. Ironically, web services are ideally suited to the synchronous nature of NCIC transactions. The use of industry standard web services would result in considerable savings over time by allowing the use of non-proprietary NCIC access solutions. Nlets is continuing to work with the FBI to coordinate common standards for web services.

D. Justice Reference Architecture

The Global FAC has established the goal of defining a Justice Reference Architecture which will serve as a broad framework for the adoption of service oriented architecture (SOA) within the Justice and Public Safety community. Nlets has also participated in the Messaging Focus Group.

Nlets is undertaking the development of a Technology Strategic Plan. This plan will mirror the current "business" strategic plan. A key goal in the development of this plan will be alignment of service interfaces with the FBI CJIS systems to the extent possible. We will involve the FBI CJIS division in this process.

E. Nlets Background

Historically, Nlets has used an asynchronous guaranteed delivery data exchange model with proprietary TCP/IP socket level communications (or legacy binary synchronous data link communications), and text-based transactions with data formatted as field value pairs reminiscent of older synchronous terminal transactions. The AISLE grant implemented the initial phase of Web Services consisting of the development and deployment of a simple symmetric "send message" Web Service. The Nlets Web Service

AISLE II: Accelerated Information Sharing for Law Enforcement

Definition Language (WSDL) was defined, and corresponding Web Services were deployed for each leg of the switching infrastructure. The use of Web Services had the immediate benefit of eliminating the need for proprietary socket level communications and provided an operational Web Services framework.

OSI Layer	Nlets Today	Nlets Web Service
Application	Nlets Applications	Nlets Applications
Presentation	Nlets Legacy	XML, WSDL, MIME
Session	Nlets TCP/IP MQ®	Web Services
Transport	TCP	TCP
Network	IP	IP
Data Link	Frame Relay	Frame Relay
Physical	Frame Relay	Frame Relay

Figure 3 Nlets Web Services

AISLE II: Accelerated Information Sharing for Law Enforcement

II. PROJECT DESIGN, DATA AND METHODS

A. Nlets infrastructure

1. Background

This project provides access to INTERPOL Person, Travel Document and Vehicle records in Lyon France. This access is available to all law enforcement personnel nationwide utilizing the NLETS network. Transactions are submitted to NLETS as standard NLETS Message Keys. These transactions are then transmitted by NLETS to the USNCB (United States National Central Bureau) switch in Washington D.C. Transactions are converted to an INTERPOL compatible format and submitted to the INTERPOL system in Lyon. Beyond the scope of the original project, an additional interface to an INTERPOL provided MIND platform has also been built. The USNCB is one of three pilot nations participating in the MIND platform project. It is our understanding that the U.S. is the first nation to establish a working interface. The MIND platform is updated nightly by INTERPOL and serves as a backup in the event that the live INTERPOL system is unavailable.

The new interface is implemented as the USNCB port to the NLETS system for exchange of information nationwide and also provides communications between the USNCB and all nations that participate in INTERPOL. Currently the United States provides access to its NCIC Vehicle records for all participating INTERPOL nations.

The United States National Central Bureau (USNCB) is the agency responsible for allowing all INTERPOL participatory nations to gain access to the NCIC vehicle database. In the post 9/11 world it now allows United States law enforcement to query the INTERPOL database also. It is telling that just during the test phase, approximately 500 incidents of entry into the United States utilizing stolen travel documents have been identified.

AISLE II: Accelerated Information Sharing for Law Enforcement

2. Project Design

The project was designed to integrate the new NLETS International interface and message processing capabilities into the existing Message Switching system rather than providing a separate system that operates in between the target system and the Message Switch. This design simplifies the configuration of the systems and leverages the operating characteristics of the system.

3. Project Data

The NLETS International XML project centers on the receipt and transmission of Person, Travel Document and queries and response messages. As such, message formats conform to GJXDM specifications. Additionally, the following standards were implemented:

Web service messages are well-formed XML documents enclosed in a SOAP XML envelope. These SOAP messages are transported between communication endpoints using HTTP over TCP-IP.

SOAP is a simple messaging framework for transferring information specified in the form of an XML infoset between SOAP endpoints.

Extensible Markup Language (XML) is a platform-independent toolset used to represent content as a tagged, unambiguous, structured data set. The payload of an OpenFox™ web service SOAP message is an XML document containing pre-defined query and response formats. The payload or body of the each message adheres to the Justice Department's XML Data Dictionary element naming conventions.

For communication between USNCB and NLETS

```
<n:NLETS version="3.0" xmlns:n="http://www.nlets.org"
  xmlns:j="http://www.it.ojp.gov/jxdm/3.0.3">
  <n:NLETSInquiryMessage>
    <n:NLETSInquiryHeader/>    <!-- Originator/Destination(s) ControlField, Key -->
    <n:NLETSInquiryData/>     <!-- Inquiry Parameters -->
  </n:NLETSInquiryMessage>
</n:NLETS >
```

```
<n:NLETS version="3.0" xmlns:n="http://www.nlets.org"
```

AISLE II: Accelerated Information Sharing for Law Enforcement

```
xmlns:j="http://www.it.ojp.gov/jxdm/3.0.3">
<n:NLETSResponseMessage>
  <n:NLETSResponseHeader/> <!-- Originator/Destination(s) ControlField, Key -->
  <n:NLETSInquiryData/> <!-- Original Inquiry Parameters -->
  <n:NLETSResponseData/> <!-- Response from Interpol -->
</n:NLETSResponseMessage>
</n:NLETS >
```

XSLT is a transformation language for XML documents. An XSLT style sheet is an XML document that contains the instructions for transforming or displaying an XML document.

Global Justice XML Data Model (GJXDM) is an XML standard designed specifically for criminal justice information exchanges, providing law enforcement, public safety agencies, prosecutors, public defenders, and the judicial branch with a model to effectively share data and information in a timely manner.

WSDL is an XML format for describing web services, as a set of endpoints or ports which operate on messages sent over a network

Hypertext Transfer Protocol (HTTP) is an application-level protocol used primarily in the transfer data over the internet. The underlying transmission protocol is still accomplished via standard TCP-IP communications.

Sun Microsystems Java SDK is a set to development tools and a runtime environment for implementing robust, scalable platform independent applications.

Sun Microsystems Java Web Services Developer Pack (JWSDP) is a set of development tools based on the Java SDK but with specific API's and tools designed for writing and maintaining web service applications.

In addition, to logging and auditing, the OpenFox™ then performs the following:

- Validates the message and applies any required edits
- Transforms the request using XSLT into INTERPOL format
- Transmits the INTERPOL formatted query to INTERPOL via web service
- Receives the INTERPOL web service reply
- Transforms the INTERPOL reply to GJXDM format

AISLE II: Accelerated Information Sharing for Law Enforcement

- Sends the reply back NLETS for forwarding to the originator

The USNCB OpenFox™ web services were built upon industry standard XML and Justice Department standards. These web services were embedded within the OpenFox™. This provided a tightly integrated set of web service endpoints that fit neatly into the existing USNCB communication view. Each web service endpoint was exposed within the OpenFox™ as a standard interface station thus leveraging all the existing functionality and addressability inherent to all OpenFox™ stations (e.g. ability to set down, monitor, trace, redirect, copy input, etc). By tightly integrating the new web services it appears a standard interface station. This had the added benefit of eliminating the need for administrator re-training.

4. Project Methods

The following principles and guidelines were used when designing the new interface:

- Established clear and complete understanding of the requirements
- Communicated understanding of the requirements
- Compared existing product capabilities and functionality to the requirements
- Created definitive requirements for changes and extensions to existing capabilities
- Communicated specific change and deliverables definitions
- Created specific and detailed work plan based on product change and extension definitions
- Executed updated work plan

In addition the following characteristics of an interface were considered:

- Protocol
 - Methodology – the protocol logic
 - IP addresses
 - Definition of send and receive ports
 - Connection criteria
 - Criteria for keeping connection alive
- Error conditions to report
- Recovery from errors
- Message Characteristics
 - Message headers
 - Message formats
- Security issues
 - Encryption Method
 - User Logon rules

AISLE II: Accelerated Information Sharing for Law Enforcement

The end goal was to ensure the new interface became a standard OpenFox™ process controlled and executed in the standard OpenFox™ manner. Testing procedures included the creation of both sides of the interface, client, and the server. The software has been tested at USNCB headquarters by sending approximately 5 million transactions to INTERPOL.

5. Security

The existing OpenFox™ system is highly secure and the interface to the USNCB web services system was implemented with the ability to take advantage of the hardware encryption or to utilize SSL. USNCB chose hardware encryption for this implementation.

B. New XML subscribers

1. Background

The Delaware AISLE II effort provides the hardware/software infrastructure necessary for the success of the Delaware portion of both the AISLE II and CANDLE grants.

This effort is a customization of the Delaware DMV and Criminal History request and response system as they each relate to the National Law Enforcement Telecommunications System. The following goals have been accomplished:

- (1) interpose a new gateway message switch server with the ATS XML Message Router (XMR), between the NLETS connection and the Delaware State Police (DSP) message switch referred to as the CMP switch
- (2) customize a new interface for the CMP to query and receive data from the Delaware Criminal Justice Information System (DELJIS) Mainframe

AISLE II: Accelerated Information Sharing for Law Enforcement

(3) customize new functionality and interfaces on the DELJIS application server in support of XML-based DMV and rapsheet messaging

(4) customize a new interface for the ATS XMR to query and receive DMV Images from the Delaware DMV Image Repository server

(5) customize a new data conversion service for Delaware in state DMV transactions

(6) Provide and receive criminal history records (rap sheets) in the Interstate Transmission Specification for Criminal History Records (version 3.0) to and from NLETS.

2. Project Design

The State of Delaware has modified their current architecture by installing a set of ATS XMR servers that have created a gateway between NLETS and the Delaware State Police CMP switch which serves both the Delaware Justice Information Service (DELJIS) and all authorized criminal justice agencies for the processing and routing of XML formatted DMV and rap sheet transactions using Web Services. The XMR will be extended to provide conversion between NLETS Legacy Text format and XML format, as well as a specialized interface for accessing Delaware DMV Images (via Web Services SOAP transactions to the Delaware DMV Image Repository server).

In this architecture, the DSP Message Switch remains responsible for logging of all messages in accordance with CJIS and NLETS security policies. The ATS XMRs are inserted between NLETS and the CMP Message Switch, and are responsible for providing XML versions of CANDLE DMV and rap sheet (Interstate Transmission Specification 3.0) messages for whichever clients – DELJIS or NLETS – request them. Legacy DSP clients will receive plain text data as usual. The XMR is also responsible for receiving XML versions of the CANDLE DMV and rap sheet. The DSP CMP Message Switch receives DMV data from the State of Delaware DELJIS Mainframe using a Broker Call Transaction. DMV images are not

AISLE II: Accelerated Information Sharing for Law Enforcement

stored on the mainframe, but instead are held in a separate State of Delaware DMV Image Repository.

This data may be accessed by web services calls.

The following documents were referenced throughout the project:

- CANDLE XML Schemas
- Interstate Transmission Specification 3.0

Modified the XMR Data Processing windows service as follows:

- XSLT stylesheets have been developed for the rap sheet. These handle the conversion to XML that is consistent with the Interstate Transmission Specification 3.0
- provide the ability to receive CANDLE formatted DMV messages from other CANDLE capable states
- convert an NLETS text messages into a mixed format message, and
- insert image data (from a web service created and maintained by Delaware) into an NLETS XML document.

The modifications required were basically to change the methodology for how to interact with the Delaware mainframe to retrieve NLETS data. Prior to the introduction of the XMR, Delaware maintained an ADA-SQL connection to retrieve data from the mainframe. When the XMR was incorporated, they switched to an Entire-X Broker to retrieve this data. This required recoding of the NLETS interface on the CMP switch and also the revision of routing tables to accommodate for routing to the XMR.

The Entire-X Broker and mainframe programs used in the CANDLE and AISLE II project were already in use by DELJIS applications so modifications to these was very minimal. The buffer size (the amount of data allowed to be sent or received) of the Entire-X Broker was increased from 27,500 bytes to 900,000 bytes. This increase was made to accommodate all of the extra data fields being requested by NLETS. Two new mainframe programs for retrieving CJIS data were also created for the DELJIS applications name searches since NLETS name searches required many fields not used by the DELJIS in house applications. Additional data fields were added to existing programs for license, registration and rap sheet inquiries to satisfy NLETS requirements.

AISLE II: Accelerated Information Sharing for Law Enforcement

3. Project Data

At this point we are working on initiating system test and do not have test data.

4. Project Methods

The project/technical team met in Delaware in March and July of 2005 to establish goals and to design the architecture of the system. Ongoing weekly team calls have kept the team working together on a regular basis to report status.

Delaware mapped their current mainframe elements to the GJXDM elements. All GJXDM elements were used first to map to the current mainframe elements. New XML tags were created only if there was not a GJXDM equivalent.

The NLETS CANDLE schemas were used to establish the XML structure used for the XMR stylesheets (XSLT's) that were modified to handle the CANDLE XML.

The Interstate Transmission Specification 3.0 was used to establish the XML structure for the stylesheets that were modified to handle the latest rapsheet specification.

The project is now entering the system test phase that when successfully completed will allow the project to be implemented in a live production environment.

5. Security

The XMR was installed in a secured network DMZ and is isolated from any network access except that for specific NLETS messages.

Connectivity between XMR and NLETS is restricted by firewall rules and only specific NLETS traffic is allowed.

Any vendor or maintenance access to the XMR is achieved through an encrypted and authenticated VPN connection.

AISLE II: Accelerated Information Sharing for Law Enforcement

C. Electronic Mail

1. Background

Nlets has traditionally provided support for a single information transport and data exchange protocol that leveraged proprietary, static and costly legacy socket specifications. In conjunction with the initial AISLE Grant, Nlets greatly expanded the law enforcement and public safety information sharing potential and communication options by deploying an open standards web service interface. Now, through the AISLE II Grant SMTP Interface Project, Nlets has further expanded the collaboration and information exchange potential by implementing another open standard interface, Simple Mail Transport Protocol (SMTP). Industry standard SMTP email provides a cost effective, easy to implement interface solution that facilitates the membership expansion and interagency communication.

The primary objective of the AISLE II SMTP Interface effort was to enable police officers, public safety officials and analysts to use standard electronic mail software to communicate and share information over the Nlets network. Therefore, law enforcement and public safety personnel will have the option to leverage familiar applications for the exchange of information. Also, since open standard interfaces are more mainstream and simple to implement, public safety officials will have ever expanding potential for information sharing.

2. Project Design

The guiding design principle of the AISLE II SMTP Interface effort was to develop an interface solution that would leverage existing investments in information technology infrastructures while providing familiar end user applications. Most of the public safety organizations that comprise the Nlets membership have invested in an enterprise electronic mail infrastructure for intra and inter-agency communication. Nlets has expanded the communication interface options to include a new email gateway service to permit

AISLE II: Accelerated Information Sharing for Law Enforcement

connections from member's electronic mail systems. The connector permits member organizations to participate on the network using only their existing email infrastructure.

Another critical system design factor was the implementation of an interface that could effectively support both large, high volume members as well as smaller, messaging based users. The SMTP Interface Services were designed to scale up to meet large membership functional and performance requirements, including support for all message transaction types. The new interface services were also designed in a manner to effectively support free form text based administrative messaging for smaller organizations.

3. Project Data

The AISLE II Grant SMTP Interface effort implemented new services to send and receive RFC-822 compliant electronic mail messages. The new services are responsible for the email message format conversions, including RFC-822 envelop translation to Nlets address header and free form content into Nlets structured and unstructured standard content. Therefore, Nlets members can send data in any of the acceptable format types including legacy text and GJXDM 3.0 XML. The new services were also developed to provide full support for text based and binary image attachments. In addition, the new services are responsible for promoting interoperability with other Nlets members by converting the SMTP standard transport into either legacy socket protocol or open standard web services.

4. Project Methods

The asynchronous element of electronic mail transport and delivery represents a compelling messaging methodology that parallels the traditional bidirectional, asynchronous messaging common throughout the Nlets system. The new SMTP Interface provides the familiar send/receive paradigm using the standard email model on one side of the Nlets switch while providing the necessary translation services for downstream users on the backend. In addition, the new services have also bridged the gap between newer email standards and legacy transports, by intercepting and translating SMTP Non-delivery reports

AISLE II: Accelerated Information Sharing for Law Enforcement

into standard Nlets Status Messages. Therefore, the new SMTP interface is able to guaranteed message delivery or provide feedback to the user that the message was not deliverable.

In order to achieve the necessary format conversion and protocol transport, the new services implemented a domain name service to Nlets ORI address transformation methodology. The addressing method enabled interoperability between legacy ORI based transactions and standard email based messaging. The enhanced interoperability will promote information sharing and open communication throughout the public safety community.

5. Security

Information security will be provided through both application and network access controls. Nlets will utilize standard network-based encryption along with firewalls that provide address and port access restrictions. The application level security will consists of configurable membership based access control that will be configured based on the address of the endpoint system as well as the content of the message.

AISLE II: Accelerated Information Sharing for Law Enforcement

III. PRESENTATION OF FINDINGS

The AISLE II Project has far exceeded the grant application goals and expectations in a number of measurable ways – in the number of states involved, in the quantity of service transactions implemented, and even in the reach of services by including both interstate and intrastate services.

The initial grant identified the prospect of three states. The AISLE II Project ultimately provided funding and resources for five states. Wisconsin, Delaware, Iowa and Maine have all implemented AISLE II services. In addition, New York State is implementing a major state system modernization utilizing AISLE II technology.

A. Nlets infrastructure

1. Dissemination Strategy

The new interface and capabilities were first implemented in a “test” environment wherein the software was placed upon a test system at USNCB communicating to the NLETS “test” system. The operation of the system was checked for correct operation and now being moved to production.

2. Performance

The performance of the new system utilizing web services with message inquiries and responses utilizing GJXDM data elements is more than acceptable but significantly less than the legacy systems when compared on a transaction basis. The turn around response time between the OpenFox™ and the USNCB system varies but is generally greater than one second. The same measurement for the legacy system interface was consistently less than one second. To compensate for this, the interface was implemented as a multi-threaded service so that the web services interface could be working on several transactions in parallel.

B. New XML subscribers

AISLE II: Accelerated Information Sharing for Law Enforcement

1. Preliminary Findings

Our preliminary findings are that the XMR can work with the Delaware Criminal Justice architecture (i.e. DELJIS Region of the state's mainframe and the Central Message Processor managed by the State Police) and accomplish our AISLE II goals. We will be presenting our test data to NLETS when it is available.

2. Dissemination Strategy

We will be sharing our information with the agencies within the State of Delaware that plan to move towards XML and also other State's agencies representatives that are interested at national conferences such as the NLETS conference. We will also present our results at the annual DELJIS conference in October 2007. We can supply our final results to other States as requested.

3. Performance

The overall performance of the system is expected to be acceptable per the State's standards.

C. Electronic Mail

1. Preliminary Findings

The AISLE II Grant SMTP Interface Project resulted in the design, development and implementation of the components necessary to establish an open standard electronic mail (SMTP) interface on the Nlets System. The new SMTP Interface was fully tested under a series of unit and system level tests. In addition, the state of Wisconsin Department of Justice developed a pilot implementation of the SMTP interface that enable the new services to be fully tested in an operational environment. The project concluded with the successful exchange of information between the WI pilot SMTP interface and the legacy, text-based Maine system.

The following description provides the details of the successful operational test with WI and ME

AISLE II: Accelerated Information Sharing for Law Enforcement

- A WI user sends an email message through the standard WI State Electronic Mail System which then relays the message to the Nlets Test System using standard SMTP email.
- The Nlets Test System receives the SMTP message, converts the message content from an RFC-822 email message into a text message. The new services then translate the protocol from SMTP to legacy socket protocol and send the message to the ME legacy system.
- The ME system acknowledges the socket-based transmission and then sends the text based message to the correct user based on the applicable terminal identifier.
- The ME user then utilizes a standard public safety terminal to receive the test correspondence and validate the content and format of the message.
- The ME user then replies to the legacy message, thereby initiating a return message from the legacy law enforcement terminal, through the Nlets system, to an email recipient in WI.
- The Nlets Test System receives the legacy, text message, converts to email message and forwards the message to the WI state electronic mail server.
- The WI Email Server receives the message and forwards to the appropriate internal mailbox where the WI user will utilize standard mail client, such as Microsoft Outlook, to review the message.

Note: Neither the email user nor the legacy user need to have any information about the destination system capability. The Nlets System performs all necessary protocol and content transformation, so the details can be abstracted from any members of the Nlets system. Therefore, user can focus on their core business and leverage the Nlets system to communicate and exchange vital public safety information.

In addition to the technical implementation and pilot testing success, the AISLE II SMTP Interface Project has successful resulted in a tremendous amount of interest from membership organizations.

AISLE II: Accelerated Information Sharing for Law Enforcement

The fact that the communication interface leverages existing email infrastructures, open standards and familiar agency and end user tools has generated significant interest in both larger and smaller members. The new interface has also facilitated greater interest by promoting significant potential for new services and new members. As the entry price of technology and expertise decrease, Nlets will be able to more easily increase service offering and membership. As a result, all law enforcement and public safety personnel will benefit from the expanded information sharing potential of the system.

2. Dissemination Strategy

The existing Nlets membership will be notified of the new service offering through the agency representative model. Each membership agency has designated representatives that receive routine informational updates from via email and have access to the Nlets bulletin board service. The representatives will be responsible for communicating the new service capability throughout their organization. In addition to the existing membership notification, the Nlets Outreach Staff will communicate the new service offering to all potential new members. The Nlets outreach initiative represents an extensive program focused on the identification and education of potential new members.

The Nlets System Administration staff will be ready and available to support the testing and implementation of any member ready to evaluate and/or utilize the new service. In addition, the Nlets system administration staff will update the Nlets Technical and User Guide to provide full implementation details to facilitate membership adoption.

AISLE II: Accelerated Information Sharing for Law Enforcement

IV. IMPLICATIONS FOR POLICY AND PRACTICE

There are several implications for the practical installation of information exchange utilizing GJXDM as compared to legacy data and interested parties should be aware of these as they begin to implement these systems. The most obvious of the issues is the size factor of GJXDM documents as compared to legacy text data. This factor will affect the operating characteristics of the systems upon which it is implemented including the following resource categories:

- Processing power
- Memory
- Storage Area
- Network bandwidth

Because of the above factors significant thought should be given to upgrading or replacing the systems that currently execute the legacy functionalities.

However, it should be noted that the functionality available from the use of GJXDM, or, for that matter, any XML scheme is significant. The use of GJXDM will be widespread and will be utilized by many systems and all of the communicating partners will better understand the meaning of the data elements because of the standards. There are also significant advantages to XML tagged data within the workstation software and the ultimate users of the law enforcement information systems. For example, it is easy to find data elements that are consistently named and as a result provide valuable additional functionality such as partially filling forms based upon a prior XML message received thus reducing the keystrokes required by a user and eliminating mistakes.