

## **Preface**

This report was prepared by the XML (Extensible Markup Language) Sub-group of the Global Advisory Committee Infrastructure/Standards Working Group. The effort described below was one part of a larger program designed to allow the entire justice and public safety community to effectively share information and to communicate that information among the thousands of justice/public safety agencies at the local, state, and federal levels. The specific product detailed in this document was one of the five results of teamwork focused on developing XML standards.

The five products resulting from this effort are:

The coordination of three XML specifications:

- XML Interstate Criminal History (Rap Sheet) Transmission Specification
- Regional Information Sharing Systems (RISS) XML Data Exchange Specification
- Court Filing XML Specification

Two stand-alone documents specifically generated by this effort:

- XML data dictionary
- This document detailing lessons learned, including:
  - Principles used in developing the XML standard
  - Successful practices used in developing the XML standard

To achieve this end, the XML Work Group of the ISWG (Infrastructure/Standards Working Group) developed a common XML standard that is stable, so that it can be relied on, but not so rigid that it cannot evolve as community requirements change.

The coordination of the XML standards was an intense effort driven by business requirements of all the participants and sponsored by the Office of Justice Programs. Without support from all of those mentioned, this effort would not have been a success.

## **Overview**

While this document addresses the principles of XML<sup>1</sup> development used in reconciling three major efforts within the justice and public safety community, it sets the stage and provides excellent background for confronting issues associated with interoperability and information sharing among local, state, and federal entities. What had initially appeared as a situation with differences that were totally insurmountable

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<sup>1</sup> XML is the Extensible Markup Language developed by the World Wide Web Consortium. Information can be found at their Web site: <http://www.w3c.org>.

became workable, as the practitioners' motivations for their actions became apparent. Cooperation and then innovation were used to progress work that generated mutually beneficial results. This successful methodology can be applied elsewhere.

As detailed investigative work centered on the analysis of different XML specifications (or more precisely, implementations of the World Wide Web Consortium's XML Standard), it was obvious that three excellent efforts had been undertaken independently. It was also clear that each practitioner group aimed at satisfying its own mission and functional (operational) requirements. Naturally, therefore, the XML implementations specified for the Rap Sheet, RISS, and the Electronic Court Filing Standard would not be compatible. For example, tagging conventions were different, as well as the data elements themselves (and how they were used).

Principles and procedures were established and agreed to by all participants in the "XML reconciliation" process. It was recognized from the outset that the needs of the individual practitioner groups were of the utmost importance during technical discussions. Thus, one practitioner group would have strong feelings about a particular technical approach in one functional area, but not have a preference for the manner in which other functions are performed via XML. That observation allowed technical compromise and gave the participants the ability to dissect the whole effort and operate on it in "pieces."

One unforeseen by-product of using principles and procedures for dealing with XML development was the emergence of "best ideas." During technical discussions, with three sets of developers looking at information sharing from a new perspective, there were suggestions to choose approaches that were developed by others as the common approach. Essentially, the best ideas were picked from the three implementation specifications, regardless of who developed them.

## **1. Introduction and Background**

A number of efforts are underway to develop XML-based data exchange specifications within the justice and public safety community. In observing these development efforts, the Office of Justice Programs (OJP) noted that rather than converging on a consistent solution for use by the entire justice and public safety community, all the efforts were independent and, in many cases, divergent. A big contributor to this divergence is the lack of a legitimate, recognized repository of specifications and standards. To address these issues and foster interoperability between the emerging specifications, OJP, in cooperation with the Infrastructure/Standards Working Group of the Global Justice Information Network, established an XML working group and identified three emerging specifications with which to begin the reconciliation process. The emerging specifications are the Interstate Criminal History Transmission Specification, developed by the Joint Task Force on Rap Sheet Standardization; the Regional Information Sharing Systems (RISS) XML Data Exchange Specification, developed by RISS; and the Electronic Court Filing Proposed Standard, developed by LegalXML. These organizations are attempting to accomplish dissimilar missions with their specifications, which makes this effort somewhat

more difficult. However, an understanding of those missions not only enables progress, it broadens the utility of the proposed standard by making it applicable to multiple taxonomies accomplishing a variety of objectives.

### 1.1 XML Interstate Criminal History (Rap Sheet) Transmission Specification

In 1995, the National Task Force on Increasing the Utility of the Criminal History Record recommended expanded data content, a presentation format (page layout) for the expanded content, and the creation of a transmission format for the interstate sharing of criminal history information. The National Task Force included representatives from the Federal Bureau of Investigation (FBI), FBI Criminal Justice Information Services Advisory Policy Board (CJIS APB), National Law Enforcement Telecommunication System (NLETS), the National Center for State Courts, SEARCH, and the National Consortium for Justice and Statistics. Its members were a diverse array of justice practitioners drawn from the judiciary; prosecution; court administration; local, state, and federal law enforcement; juvenile justice pre-trial services; and state criminal records repositories. In 1996, the Joint Task Force on Rap Sheet Standardization with representation from the FBI, CJIS Division; the APB; NLETS; SEARCH; and state and local law enforcement agencies, was formed to carry forward the work of the National Task Force by developing a standardized criminal history transmission format.

*The Joint Task Force on Rap Sheet Standardization* has accomplished three major objectives:

- Developed an XML-based standardized criminal history transmission format
- Developed a standard presentation format utilizing the XML transmission format
- Developed a concept of operations, which combines criminal histories from multiple sources into a single criminal history

*The Interstate Criminal History Transmission Specification* provides a method by which an authorized user who requests an interstate criminal history record, regardless of the request method:

- Will always receive the same set of information
- Will always receive a single record for multisource interstate criminal histories, in which the criminal justice event cycles are presented in date order
- Upon request, will receive the record in computer-readable format for use in filling display screens, data entry screens or databases, or for editing or state-specific presentation formats
- Upon request, will receive the record in any of a variety of available presentation formats, tailored, for example, for a specific printer or mobile digital unit

- Upon request, will receive the record at an approved destination whether or not it is served by an intrastate law enforcement network<sup>2</sup>

## 1.2 Regional Information Sharing Systems (RISS) XML Data Exchange Specification

RISS is composed of six regional centers that share intelligence and coordinate efforts against criminal networks that operate in many locations across jurisdictional lines. Each RISS center has from 530 to over 1,300 member agencies. The vast majority of member agencies are at the municipal and county levels, but more than 300 state agencies and 700 federal agency offices are also members. The Drug Enforcement Administration; the Federal Bureau of Investigation; the Internal Revenue Service; the Secret Service; U.S. Customs; and the Bureau of Alcohol, Tobacco and Firearms are among the federal agencies participating in the RISS Program.

Typical targets of RISS activities are drug trafficking, terrorism, violent crime, gang activity, and organized criminal activities. Each of the centers, however, selects its own target crimes and the range of services provided to member agencies.<sup>3</sup>

The RISS Program developed an XML specification to address dissimilar databases and lack of information sharing standards to allow agencies to share their criminal intelligence information with a maximum of flexibility at a reasonable level of development effort and cost.

The RISS XML Data Exchange Specification has several features that make it desirable as a data sharing solution between different agency criminal intelligence databases:

- Certain criminal intelligence systems are required by law, regulation, or funding guidelines to be in compliance with 28 CFR Part 23, which contains criminal intelligence system operating policies. The RISS XML Data Exchange Specification is in compliance with applicable federal law and regulations governing the storage and dissemination of information in online criminal intelligence databases. Where compliance is not required, the RISS XML Data Exchange Specification allows the 28 CFR Part 23 portions of the specification to be ignored.

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<sup>2</sup> Joint Task Force on Rap Sheet Standardization, "Interstate Criminal History Transmission Specification-XML Version 2.0," April 2001.

<sup>3</sup> For additional information on the Regional Information Sharing Systems, see Web site <http://www.iir.com/riss/>.

- The RISS XML Data Exchange Specification supports four different levels of information exchange: a query, a query response to allow a “picklist” to be generated, detailed information about a picklist record, and submitting officer contact information.
- The RISS XML Data Exchange Specification is designed to provide support for legacy systems to allow data sharing without major changes. Systems can share their data by the addition of an interface that communicates according to the XML specification. This allows systems to share their data more easily than other data sharing solutions. The system may be modified or upgraded without requiring other systems that share data to make major changes. As long as compliance is maintained with the XML specification, no other system will be affected by modifications or upgrades to one agency’s database.
- The RISS XML Data Exchange Specification can be easily modified to allow for additional elements and functionality as additional or revised needs are identified.

### 1.3 Court Filing XML Specification

The Court Filing XML Specification provides a mechanism by which documents can be electronically filed with a court system. The developers listed the following assumptions and requirements:

1. The three-tier application model is assumed, including three cooperating applications: (1) the application on the users desk or the Electronic Filing Provider (EFP); i.e., the client; (2) the Electronic Filing Manager (EFM); i.e., the server; (3) and the Case Management System (CMS).
2. [The court filing specification], with a few exceptions, does not specify how any of the three cooperating applications will function. Rather, it defines the data elements and data tags for use in such applications.
3. Any EFM application shall have the capability to return an electronic acknowledgement to a filer.
4. The DTD (document type definition) is intended to support both the filing of a pleading initiating a new case and filings in existing cases.
5. The DTD is designed to include all data elements needed by any court. However, any court may limit, as a matter of local policy, the data it will accept in an electronic filing. In particular, a court may refuse to accept more than one filing in a single envelope, a pleading that initiates a case, payments

associated with a filing, and hypertext links to document residing elsewhere.

6. This [specification] differentiates between filing and docketing of received pleadings, orders, or notices.
7. There is no state maintained at the server between requests for a particular user connection.
8. There shall exist a method by which the user identity can be verified.
9. Extraneous data is discouraged. That is, only the information required for successful completion of the transactions should be included.
10. Certain XML document elements are assumed to have their content protected from public view. Other protected data shall be marked as such, explicitly.
11. Tags have been chosen which provide a neutral name where the definition of what some would consider a more appropriate term could vary. For example, in some courts, the “filer” is the attorney. In others, the “filer” is the party to the case.
12. The DTD is designed to support the inclusion of multiple filings in a single submission for the same case.
13. There is no intent to require multiple packets per individual task. For example, a user asking the system to provide a list of all cases she/he is associated with in order to choose the case for which a pleading is going to be made would require a single exchange of packets: one packet to make the request and the second to supply the answer.<sup>4</sup>

#### 1.4 The Role of OJP and the Global Initiative

The Global Initiative is “an effort to advise the Attorney General regarding the concurrent planning and design efforts now underway in the area of justice systems integration, as well as to advise [OJP and] the Attorney General regarding the new and developing technologies that bear upon justice information sharing.” In fulfillment of this mission, the Global Justice Information Network Advisory Committee (GAC) created four working groups, including the Infrastructure/Standards Working Group (ISWG), “which is responsible for: (1) conducting an examination of justice information management and infrastructure activities with the goal of determining how each activity relates to Global, and (2) reviewing the major standards-related efforts currently underway and providing recommendations to remedy the breakdowns in interoperability.” It is the latter responsibility through which ISWG provides significant benefits to the justice community with regard to information sharing by working closely with OJP (and its technical support staff), and is also the reason OJP is interested in developing

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<sup>4</sup> LegalXML JTC/Court Filing Working Group, “Electronic Court Filing Proposed Standard,” January 4, 2001.

as much commonality as practical among the various information sharing efforts throughout the justice and public safety community.

In meeting their responsibilities, the ISWG has assembled a group that provides an outstandingly broad representation of users in the justice community. This representation virtually guarantees that recommendations generated by the ISWG will address the widest possible range of the justice community's requirements. On the other hand, OJP, in fulfilling its responsibility of providing a suite of interoperability standards for justice and public safety community information sharing, has assembled a team of technical experts knowledgeable in adapting use requirements into technical specifications and standards. It is envisioned that, with support from the technical experts, the ISWG and its member organizations can recommend a suite of information sharing interoperability standards to the GAC. In turn, the GAC can provide recommended standards to OJP and the Attorney General for adoption as "the standard solution" for the information sharing interoperability issues confronting the justice community. Such a standard might be, for example, a data dictionary for use by the whole of the justice and public safety community.

## **2. Principles for Development of XML Specifications for the Justice and Public Safety Community**

At the OJP XML Technology Working Group meeting held June 7, 2001, in Denver, Colorado, developers of the Rap Sheet Transmission Specification, the RISS XML Data Exchange Specification, and the Court Filing Specification agreed to work under a set of guiding principles during their efforts to achieve effective information sharing between their systems. These principles are listed below:

- Any XML specification developed should be guided by the principles put forth by the World Wide Web Consortium (W3C).
- Internal system representation is not constrained by these guiding principles or the associated data element definitions. The information contained in these documents simply provides a baseline for exchange of information.
- XML specifications shall be over-inclusive by specifying those elements that may be required by fewer than all participants and making those elements optional.
- XML specifications shall be extensible.
- Wherever possible, previously developed solutions should be adopted or extended.
- International implications of XML specifications should be considered, and international standards shall be used as guides, where possible.
- XML specifications shall be broad enough to accommodate jurisdictional differences.

- When operational requirements dictate differences in specificity, mapping from the more specific elements to the less specific elements shall be made available.
- It is the responsibility of each group to ensure that all system-specific features are removed prior to transmission to another group.
- Certain complex elements are sufficiently independent and driven by group business rules such that they cannot be used by more than one organization. In such cases, the shareable simple elements contained within the complex element are defined.
- Where necessary, it is acceptable to use a more specific tag name (e.g., arrestDate), provided it includes the data model of its more generic counterpart (e.g., date).
- The data element *<number>* shall not be used. Rather, numbers are identified by their name; e.g., caseNumber.

Specific recommendations based on these guidelines are provided in Appendix A.

### 3. **Procedures for Development of XML Specifications for the Justice and Public Safety Community**

This section describes the process and procedures used to achieve success in bringing the three aforementioned specifications closer to interoperability.

1. Identify requirements each participant is attempting to meet and the goals they are trying to accomplish. Ensure all participants have at least a moderate understanding of each other's needs.
2. Identify similar information being shared by participants, and the differences and similarities between tag names.
3. Identify and resolve non-substantive differences (e.g., tag capitalization and naming conventions).
4. Identify and resolve those substantive differences that can be resolved quickly (e.g., tag names for person name elements).
5. Identify those substantive differences that are difficult to resolve. Where possible, resolve them. Where resolution is not possible (usually due to differing requirements), ensure that there is no tag name overlap and document the differences.
6. Develop a plan (with tasks, goals, and objectives) to be accomplished over a defined schedule.

Appendix A contains recommended guidelines for XML specifications. Agreed-upon simple and complex data elements are contained in a separate document (Justice and Public Safety XML Data Element Definitions).

Appendix B contains supporting statements from each of the XML specification participants about the success of the reconciliation process.

## Appendix A

### **Specific Guidelines Used in the Reconciliation Effort**

This appendix provides specific guidelines used in developing and defining data elements for use by the three participants. This includes specific guidance on tag naming conventions, adopted policies on inclusivity and extensibility, data format specifications, and a list of acceptable acronyms.

#### **A.1 Tag Names**

Tag names will have the following properties:

- Tag names will be descriptive of the data they contain and/or represent.
- There will be no spaces or other characters between words of a tag name.
- Tag names in defined specifications will be strictly alphanumeric. The exception to this recommendation is in the case of tag names developed as extensions to a specification (see A.2 below). The first letter of the tag name will be lower case (e.g., *name* rather than *Name*).
- The second and subsequent words of a tag name will be capitalized (e.g., *firstName* rather than *firstname*).
- The same tag name will not be used to represent more than one type of data (e.g., do not use the tag *type* to represent both a type of weapon and a type of vehicle; use *weaponType* and *vehicleType*).
- Tag names will be fully spelled out (rather than appearing as abbreviations and acronyms) except in the cases indicated below (in A.5).

#### **A.2 Inclusion Policy**

Where practical, the tag name inclusion policy will be quite liberal to enable a specification to meet the broadest user requirements possible. That is, it is generally recommended that if some (or one) but not all participants need a tag name, the tag name should be included in the specification and designated “optional.” This will facilitate resolution of conflicts in the future. See A.6 Additional Requirements.

### A.3 **Extension Policy**

In spite of a liberal tag-name inclusion policy, there will be cases where the specified tag names do not fulfill a user's requirements. In order to accommodate such cases, all specifications will provide explicit instructions on extending the specification. (This may or may not be integral to the specification, but should be available, nonetheless.) While many of the details of this are left to the specification developer, it is recommended that tag names for extensions be of the following format: tag name, underscore, extender identifier (e.g., *neededData\_LegalXML*).

### A.4 **Data Format**

It is recommended that the data format be UTC-8, unless an application requires UTC-16.

### A.5 **List of Accepted Abbreviations and Acronyms for Use in Tag Names**

Because there are some instances where an entity is more recognized by its abbreviation or acronym than if the name were spelled out (e.g., IBM vs. International Business Machines), there are exemptions to the "no abbreviations or acronyms" rule stated above. These accepted abbreviations and acronyms will be collected and defined here so that there is one source for those needing clarification.

Abbreviations and acronyms should be all lower case if the tag name begins with the abbreviation or acronym, and all uppercase if it is the second or subsequent word (e.g., *oriNumber* and *personID*).

The following table comprises the list of accepted abbreviations and acronyms for use in tag names.

<b>Abbreviation/Acronym</b>	<b>Definition</b>
BCC	Blind Carbon Copy a message to this recipient
CC	Carbon Copy a message to this recipient
CFR	Code of Federal Regulations (federal laws). Sometimes used to indicate compliance with a specific regulation (e.g., <i>cfr28</i> might be used to indicate compliance or non-compliance with CFR Part 28.
DNA	(deoxyribonucleic acid) Genetic fingerprint information
FBI	Federal Bureau of Investigation

HREF	Hypertext Reference – This attribute specifies the location of a Web resource, thus defining a link between the current element (the source anchor) and the destination anchor defined by this attribute
ID	Identification/Identifier
MIME	Multipurpose Internet Mail Extension – A specification for formatting non-ASCII messages so that they can be sent over the Internet
NCIC	The FBI's National Crime Information Center
ORI	The Originating Agency code assigned to a law enforcement agency or court. This is assigned by a system operator (e.g., database or network operator, but is most commonly the FBI) and is used to track usage of that system.
URI	Universal Resource Identifier (address, similar to a Web address) where a described resource can be located
VIN	Vehicle Identification Number (applied by manufacturer)

#### **A.6 Additional Requirements**

When a developer has requirements for additional elements to be included in a complex data element, those additional elements may be added; e.g., Court Filing when specifying the name of a person requires the following additional elements: full name, designation, and name alias.

## **Appendix B**

### **Responses from Participants**

This appendix contains brief statements by each of the specification participants in the effort described here. This includes statements from Regional Information Sharing Systems (RISS), developer of the RISS Data Exchange XML Specification; LegalXML, developer of the Court Filing 1.0 Specification; and the Joint Task Force, developer of the Rap Sheet XML Specification.

#### **B.1 George March, Director, RISS Office of Information Technology**

As RISS expanded its partnership with the justice intelligence community as participants on the RISS secure intranet, RISS recognized that XML could be employed to improve justice planning, investigations, and other public safety concerns to significantly improve the interjurisdictional sharing of information from within dissimilar intelligence databases and information repositories maintained throughout the justice and public safety community. The RISS XML Data Exchange Specification was developed to take advantage of the extensible capabilities of XML for that purpose.

After the RISS XML Data Exchange Specification was developed and presented to OJP for consideration, OJP convened a workshop to identify how XML was independently being adopted elsewhere within the justice and public safety community. As a result, the Rap Sheet Standardization and the Courts Filing efforts were identified as having many similarities with the RISS XML Data Exchange Specification, and among themselves.

RISS recognized the synergistic benefit that could be achieved by working with other developers to learn how other development efforts had proceeded, and to identify a way to reconcile the differences between their specifications for the benefit of the entire community of justice and public safety practitioners. RISS enthusiastically agreed to participate in the reconciliation effort as a means of improving our own development efforts and achieving nearer-term adoption of an XML “standard” for the justice and public safety community.

The dedication and resolve of the independent developers of the three specifications to recognize and appreciate the efforts of each other was remarkable. All understood that the end result of their cooperative effort to improve information sharing within their communities would significantly improve public safety. Each of them quickly and unselfishly agreed on the principles they would employ to guide their reconciliation efforts, and they unerringly employed them during the process. In the words of the Declaration of Independence, they had a “decent respect for the opinions” of one another and for the eventual need of the public citizen, which the justice and public safety community is dedicated to serve.

**B.2 John Loverude, Chair, Joint Task Force**

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**B.3 John Greacen, Co-Chair, LegalXML Court Filing Working Group**

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