U.S. Department of Justice (DOJ)

LEXS FBI EBTS IEPD Specification

Version 9.0 beta 2

Revision 4

December 9, 2009

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16 # Change History

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Revision	Date	Author	Description of Revision
1	October 7, 2009	Priscilla Walmsley	Initial Draft
2	November 9, 2009	Priscilla Walmsley	Added mapping detail
3	November 19, 2009	Priscilla Walmsley	Updated for 9.0 beta
4	December 9, 2009	Priscilla Walmsley, Gerry Coleman	Updated for 9.0 beta 2 Replaced Introduction with new Executive Summary

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Acknowledgments

The following individuals have attended our project meetings, assisted on this research effort, provided input, and reviewed this report:

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Portions of the this document and its associated schemas are based on earlier work described in *Electronic Biometric Transmission Specification (EBTS) -- NIEM Information Exchange Package Documentation*, revision 1.5, CJIS Document Number – BIO-DOC-02261-1.5.

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1. Executive Summary

The FBI's Next Generation Identification (NGI) project requires an XML version of the Electronic Biometric Transmission Standard (EBTS). The task force assigned to perform technical review of the XML development is the IAFIS Interface Evaluation Task Force (IIETF). The IIETF has recommended an evaluation of LEXS 4.0 (Logical Entity eXchange Specification Version 4.0) for fingerprint and other biometric transmissions using XML (Extensible Markup Language). The IIETF supports the move toward web-based services with the understanding that the FBI will provide support to the legacy transactions and data elements. This executive summary defines many of the acronyms used, provides background information, and offers an explanation for why it is useful to implement EBTS with XML and LEXS.

1.1 Terminology and Acronyms

CJIS. The FBI's *Criminal Justice Information Services* Division was established in February, 1992 to serve as the focal point and central repository for criminal justice information and local law enforcement services within the FBI.

APB. The FBI's CJIS *Advisory Policy Board* was established in 1994 to obtain the advice and guidance of the state and local user community on the operation of CJIS applications and programs. The philosophy underlying the advisory process is one of shared management; that is, the FBI along with local and state data providers and system users share responsibility for the operation and management of all systems administered by CJIS for the benefit of the criminal justice community.

IAFIS. The *Integrated Automated Fingerprint Identification System* became operational in 1999. It merged the technical fingerprint identification services of AFIS with the criminal history repository as a single criminal justice service. CJIS Division has management responsibility for the day-to-day operation of IAFIS.

IIETF. The *IAFIS Interface Evaluation Task Force* was established by the CJIS APB in 1999 to examine the IAFIS workflow between the states and the FBI. The IIETF's goal is to ensure effective and efficient processing for both the FBI and the states and to identify processing and specifications that need to be corrected, supplemented, or modified.

XML. *Extensible Markup Language* is a data format used when one computer sends data to another. It is the most modern of today's data transmission formats. It is an Internet standard that has been widely adopted by government and industry. It is familiar to today's generation of computer technicians and programmers. In general, implementers can expect to pay less for development and support of current technologies such as XML, and to pay more for obsolete technologies.

ANSI. The *American National Standards Institute* is a private, non-profit corporation that oversees the development and use of standards intended for use by U.S. industry. NIST-ITL uses ANSI's formal consensus development process to produce standards that

can be accredited by ANSI. ANSI accreditation certifies that NIST has used procedures that meet ANSI requirements for openness, balance, consensus and due process.

NIST. The *National Institute of Standards and Technology* is an agency of the U.S. Dept. of Commerce.

NIST-ITL. The *Information Technology Laboratory* is one of ten NIST labs that provide measurements and standards for U.S. industry. NIST-ITL has long partnered with the FBI's forensic laboratory to develop electronic capture and comparison procedures and standards for fingerprint and other identification biometrics. In 1985, NIST initiated efforts to develop a data format for the interchange of fingerprint identification information. The result of this work was the publication of an American National Standards Institute (ANSI) minutiae-based standard for fingerprints. A revision of the standard was published in 2007 as NIST Special Publication 500-271: Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information - Part 1 (ANSI/NIST-ITL 1-2007). It was followed by the XML version, which was published in 2008 as NIST Special Publication 500-275: Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information - Part 2: XML Version (ANSI/NIST-ITL 2-2008).

EBTS. *Electronic Biometric Transmission Standard*. In the 1990's, the FBI developed and published an electronic format for contributing fingerprints from state repositories to the FBI (then called EFTS). Today, the vast majority of fingerprints, both civil and criminal, are transmitted electronically using the FBI's standard. The legacy formats, however, are not XML. The FBI is in the process of developing an XML version of this transmission standard.

NIEM. The National Information Exchange Model is a partnership of the U.S. Department of Justice and the Department of Homeland Security. It is designed to develop, disseminate and nation-wide information exchange standards and processes that can enable jurisdictions to effectively share law enforcement and critical information in emergency situations, as well as support the day-to-day operations of government agencies throughout the nation. NIEM introduces the concept of an **IEP**, "information exchange package" as a data structure containing XML elements to support information sharing. An exchange package is a package used for a particular purpose – like the data elements that would be used to report a booking event. The documentation that is required to define a package is known as an **IEPD,** or *Information Exchange Package Documentation*. There is an IEPD clearinghouse that contains documentation on dozens of exchange packages.

LEXS. *Logical Entity Exchange Specification*. Developed by the U.S. Dept. of Justice, LEXS is a framework for packaging XML data. It can be used for packaging elements defined by NIEM, or for any other XML content. LEXS also standardizes transaction handling (like query/response), and provides constructs that can be used by the FBI and state and local agencies for their own business-specific data.

1.2 LEXS as an XML Framework for EBTS

Compared to legacy transmission formats, XML introduces new opportunities and presents new problems. It is not always possible or desirable to create an XML structure that exactly "looks like" a legacy format. This document will show that, although LEXS packages may not exactly "look like" the legacy EBTS packages, it is a useful re-arrangement of the well-known data fields. LEXS capitalizes on the opportunities of XML and solves problems that other arrangements do not.

1.3 XML Opportunities

XML has become the most widely-used transmission format because it allows dissimilar computer systems to communicate with each other, it provides mechanisms for data validation and translation to human-readable formats, it is supported by virtually every vendor, and it can be maintained by off-the-shelf products and tools.

Dissimilar computers. The FBI's network for EBTS transactions includes approximately 30,000 local law enforcement agencies, every state AFIS, and civil background check vendors. Local law enforcement will initiate the arrest and booking submissions and will be the primary users of fast-id (fingerprint transactions that return an immediate identification response). The volume of civil background check submissions equals or exceeds law enforcement transaction volume. State AFIS systems and civil background check vendors forward EBTS transactions to the FBI. As in the past, the EBTS network must allow computer equipment from any manufacturer to benefit from biometric services. XML, however, is an open, non-proprietary standard that will be easier to implement and less expensive to maintain than binary/ASCII formats currently in use.

Data validation. XML includes tools for discovering errors in a data transmission package. In the past, all kinds of data validation required custom computer programming. The XML validation feature makes it easier to bring new systems on line, and to improve the quality of data stored in repositories. An XML *schema* contains the information needed to validate an XML *instance*.

Translation. XML includes tools for translating a data transmission package into other formats. One popular use is to translate into human-readable content (a "presentation" format). The XML translation feature makes it easier to integrate new XML formats with existing legacy systems.

Vendor support. Today, every computer hardware and software vendor is familiar with XML. They have invested considerable effort to hire or train expert staff. Vendors involved in the development of new systems *want* to use XML.

XML tools. Modern databases, operating systems, application development environments, telecommunication systems, and the Internet have utility programs and mechanisms for handling and manipulating XML content. As vendor investment in

training and use of tools increases, the use of XML will increase. It is important perhaps that the design of XML structures be optimized to facilitate use of XML tools.

1.4 The Problem with XML

A big challenge for the criminal justice community is to create standard data packages for the most common kinds of communication. The problem with XML is that it is so easy to define a communication structure that everybody is doing it -- and each effort brings about a different product. NIEM, widely embraced by criminal justice, defense, and homeland security, has been successful in standardizing data *elements*, but not in standardizing data *packages*. LEXS addresses this challenge by standardizing the data *package* for EBTS.

1.4.1 Standardizing Information Exchange

While defining an IEP using accompanying IEPD is important, unfortunately, defining an exchange package is not the same thing as *standardizing* a single package so that it is used by everybody for the same business purpose. Inevitably – a consequence perhaps of managing a business for 30,000 agencies – there are local data needs and jurisdictional differences that must be accommodated.

1.5 The Basic LEXS Approach to EBTS

LEXS is a framework constructed to contain one or many kinds of XML content in a single package. LEXS standardizes the structure and format of an information exchange package, making packages reusable and consistent across implementations.

It is designed to be used in a transaction environment, and to allow different validation procedures on its separate parts. LEXS has already been adopted by the FBI for use in the N-DEx system. Local law enforcement agencies and vendors who do or want participate in N-DEx are already learning to use LEXS.

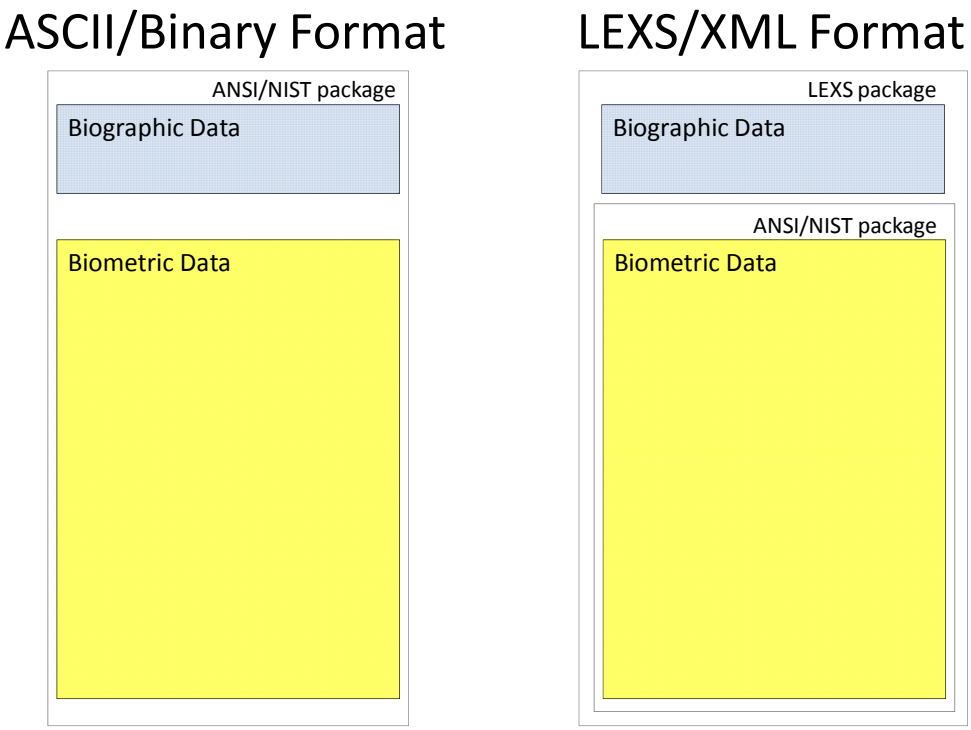
The *biometric* content of the EBTS-XML message will be contained in a structure exactly according to the ANSI/NIST Part 2: XML standard. The *biographic* content will be in one or more LEXS structures, outside the ANSI/NIST structure.

Biometric content. *Fingerprint images, mugshots, tattoo photos, palmprint images and related text or code elements*. The ANSI/NIST Part 2 interchange standard defines an XML format for transmitting images and related data. Related data includes image attributes like pixel density, horizontal and vertical image size, palm or finger position, compression algorithm, image capture date, subject pose code.

Biographic content. *Subject identification data, arrest detail, and optional disposition information*. Biographic data includes subject name, sex, race, date of birth, height, eye color, FBI number, date of arrest, arrest offenses, court sentencing. The ANSI/NIST standard does not define any of these elements. The FBI, state, and local agencies

create biographic content to accompany the biometric images. In the past, this content has been inserted into the ANSI/NIST structure (the "Type 2" record).

The LEXS implementation of EBTS keeps intact the biometric data as required by ANSI/NIST, and provides LEXS structures for the biographic data in a place other than the ANSI/NIST Type 2 record.



LEXS controls how NIEM elements are organized inside an exchange package. LEXS does two "standardizing" things: (1) it has its own elements for managing the transactional elements of an exchange; (2) it has a fixed framework for the most common criminal justice entities, like person, agency, location, activity, and vehicle.

While LEXS does standardize the framework for an exchange it is also adaptable and extendable. However, LEXS strictly defines how the exchange package is extended using what is called a "*structured payload*". Thus, LEXS provides a framework in which state and local participants can add their own content to the EBTS content required for IAFIS. The variable content, necessary for the thousands of agency users and their jurisdictional differences, is contained in a *structured payload* and is segregated from the elements that can be standardized.

1.5.1 Detail of LEXS Implementation of EBTS

A few transactional elements in the ANSI/NIST package (Type 1) record will be copied into LEXS *metadata*. The EBTS biographic and descriptive data populates the LEXS *digest* and an FBI EBTS

Descriptive *structured payload*. Local and state content populates other *structured payloads*. The ANSI/NIST biometric package will be contained in an ANSI/NIST *structured payload*.

Metadata. This is a fixed part of a LEXS message that relates to the transaction or exchange. There are elements here to manage different kinds of exchange, like query/response, publish/subscribe. For EBTS the exchange type will be *DomainRequest* and *DomainResponse*. The EBTS elements copied into this message section will be transaction date, destination agency, originating agency, transaction control number and reference number.

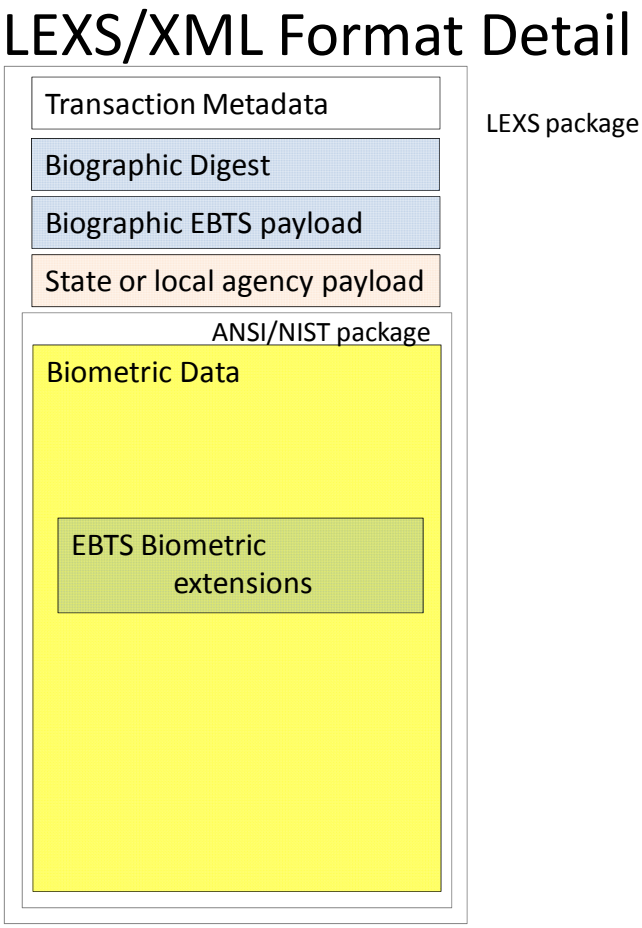
Digest. This is a fixed part of a LEXS message that contains the standard entities of person, activity, organization, and location. The *digest* also contains associations between the standard entities; for example the person can be associated with an arrest event.

Structured Payload. A structured payload is the LEXS mechanism for accommodating data that does not fit into the digest. It is the mechanism that allows LEXS to contain and segregate business or jurisdictional differences from the *standard* content in the digest. Each payload has its own "community," so that content added by a state or local agency can be identified and distinguished from content defined by others.

FBI EBTS Descriptive Structured Payload. This structure will contain EBTS biographic and descriptive elements that are not defined by the LEXS digest, like the palmprint available indicator, or the field for requesting an electronic rapsheet.

State or Local Structured Payloads. LEXS can contain structured payloads of many types. A local agency or state could define its own payload and insert it into the LEXS package. Non-EBTS payloads can be easily ignored or discarded by the FBI. Payloads can be separately validated by XML schemas.

ANSI/NIST Structured Payload. A data structure conforming to the biometric ANSI/NIST interchange standard will be included in the LEXS package in its own structured payload. Some of the ANSI/NIST biometric elements will be extended by adding EBTS elements; for example a Type-9 minutiae record will need the EBTS minutia characterization quality element. But, it is expected that the Type-2 biographic record will be empty; the ANSI/NIST standard describes the content of a Type-2 record as optional.



1.5.1.1 Why Use LEXS?

Transaction management. By today's transaction management standards, the legacy ANSI/NIST structure provides only a rudimentary container. LEXS adds the structure necessary to manage exchange interactions. EBTS needs transaction extensions, and LEXS provides a framework specifically intended for transaction management.

Entity standardization. The LEXS digest adds value to NIEM by standardizing the most commonly used EBTS biographic entities: person, agency, location, and activity. EBTS should not create its own version of these entities out of raw NIEM elements. The same local agencies that will be using LEXS entity definitions to report booking events to N-DEx should be allowed to use LEXS entity definitions to report booking events to NGI.

XML validation control. If the ANSI/NIST package is the container for EBTS transactions, then there would have to be a different XML schema for every state and local version of the ANSI/NIST biometric package. LEXS is structured to allow for multi-pass validation, allowing different schema for different payloads. The FBI's data requirements would be clearly segregated from state and local extensions.

Biographic/Biometric segregation. The ANSI/NIST package is a credible structure for the electronic interchange of fingerprints, mugshots, palmprints, etc. But, the ANSI/NIST package is a poor container for merging biometric and biographic data. Biometric images are captured by systems dedicated to that business – livescan equipment, mugshot photo systems, and automated fingerprint identification systems. These biometric systems typically do not hold or manage large amounts of biographic data. They are often interfaced to booking management systems, police record systems, or criminal history systems. When single transmission package must contain both biographic and biometric data, the data are extracted from separate systems and merged together into a single transmission package. For EBTS submissions, the biometric data will go to an AFIS or a photo system, and the biographic data will go to the criminal history database. LEXS provides better structure and control for handling the aggregation and disaggregation of these separate data types.

1.5.2 Summary

LEXS is a viable framework for implementing EBTS. It capitalizes on the strengths of XML, and increases the degree of standardization in the criminal justice community. It solves the problem of how state and local extensions to EBTS can be managed effectively, and it provides a transaction management layer necessary for the increasingly complicated business of biometrics envisioned by NGI. LEXS is able to accommodate the EBTS business with only negligible addition to the size of the exchange packages.

2. Normative References

This specification is based on the following other technical specifications:

- **LEXS 4.0 beta**. The general message structure as well as the digest contents are defined by LEXS (Logical Entity Exchange Specification) version 4.0. Available from http://www.lexs.gov.
- **NIEM 2.0.** The National Information Exchange Model version 2.0. Available from http://www.niem.gov. Version 2.0 is used with ANSI/NIST-ITL-2-2008.
- **NIEM 2.1.** The National Information Exchange Model version 2.1. Available from http://www.niem.gov. Version 2.1 is used with LEXS 4.0.
- **ANSI/NIST-ITL 1-2007**. American National Standard for Information Systems— Data Format for the Interchange of Fingerprint, Facial, & Other Biometric Information – Part 1. Available from http://fingerprint.nist.gov/standard/Approved-Std-20070427.pdf.
- **ANSI/NIST-ITL 2-2008**. American National Standard for Information Systems— Data Format for the Interchange of Fingerprint Facial, & Other Biometric Information – Part 2: XML Version. Available from http://fingerprint.nist.gov/standard/Approved-XML-Std-20080828.pdf.
- **FBI EBTS 9.0**. Electronic Biometric Transmission Specification (EBTS) (IAFIS-DOC-01078-9.0 of September 30, 2009). Available from http://www.fbibiospecs.org/docs/EBTS_v9_0_User_Services_Draft_Master09302009.pdf.

3. LEXS Messages

The FBI EBTS IEPD uses two LEXS messages:

1. ulexde:domainRequest is used for EBTS request messages (messages coming into the FBI Biometric System)
2. ulexde:domainResponse is used for EBTS response messages (messages generated by the FBI Biometric System)

The ulexde prefix refers to the namespace http://ulex.gov/domainexchange/2.0. ULEX Domain Exchange (ULEX DE) contains messages are used for general-purpose data exchange in a LEXS environment. Although ULEX defines other messages that may roughly correspond to EBTS functionality, such as ulexsr:doStructuredSearchRequest and ulexsr:getDataItemRequest, these messages are not used because their choreography does not exactly match the EBTS choreography. Use of the domainRequest and domainResponse messages allows applications to maintain the existing choreography of EBTS 9.0 messages.

The general structure of a ULEX domainRequest message is shown here:

```
<ulexde:domainRequest ...>
    <ulex:DomainRequestMessage>
        <ulex:SRMessageMetadata>
            <!-- Message Metadata -->
        </ulex:SRMessageMetadata>
        <ulex:DomainAttribute>
            <ulex:DomainName>FBI EBTS 9.0</ulex:DomainName>
            <ulex:DataItemPackage>
                <!-- Data Item Package -->
            </ulex:DataItemPackage>
        </ulex:DomainAttribute>
    </ulex:DomainRequestMessage>
</ulexde:domainRequest>
```

The general structure of a ULEX domainResponse message is shown here:

```
<ulexde:domainResponse ...>
    <ulex:DomainResponseMessage>
        <ulex:SRMessageMetadata>
            <!-- Message Metadata -->
        </ulex:SRMessageMetadata>
        <ulex:ResponseMetadata>
            <!-- Response-specific Metadata -->
```

```
            </ulex:ResponseMetadata>
            <ulex:DomainAttribute>
                  <ulex:DomainName>FBI EBTS 9.0</ulex:DomainName>
                  <ulex:DataItemPackage>
                        <!--  Data Item Package  -->
                  </ulex:DataItemPackage>
            </ulex:DomainAttribute>
      </ulex:DomainResponseMessage>
</ulexde:domainResponse>
```

3.1 Message Metadata

The message metadata section, contained in the ulex:SRMessageMetadata element, contains information about the message, such as the sender and receiver, the date, and the LEXS version in use. Certain ANSI/NIST-ITL Type 1 and 2 fields are included in the metadata section, namely:

FBI EBTS Field	LEXS Metadata Element
DAT (1.005 -- Date)	ulex:MessageDateTime, with the time portion of the format set to "T00:00:00".
DAI (1.007 -- Destination Agency Identifier)	lexs:MessageDestinationIdentifier/lexs:SystemID
ORI (1.008 -- Originating Agency Identifier)	ulex:MessageOriginMetadata/lexs:SystemIdentifier/ lexs:SystemID
TCN (1.009 -- Transaction Control Number)	wsa:MessageID
TCR (1.010 -- Transaction Control Reference)	ulex:ResponseMetadata/wsa:RelatesTo
CRI (2.073 -- Controlling Agency Identifier)	ulex:SRMessageMetadataDomainAttribute/ fbiebts:ControllingAgencyList/ fbiebts:ControllingAgencyID

The Type 1 fields are duplicated in the Type 1 record in the biometric payload, in order to maintain compliance with ANSI/NIST-ITL.

3.2 Domain Attribute

The ulexde:domainRequest and ulexde:domainResponse messages contain an element, ulex:DomainAttribute, that is used for domain-specific information exchange. In the case of LEXS FBI EBTS, the ulex:DomainAttribute must contain:

- one ulex:DomainName element, whose content is "FBI EBTS 9.0", and
- one ulex:DataItemPackage element that contains the core of the EBTS message. The structure of the LEXS Data Item Package is described in the next section of this document.

4. Structure of a LEXS Data Item Package

The LEXS data item, in the context of the FBI EBTS IEPD, has four parts:

1. Data Item Metadata
2. Digest
3. FBI EBTS Descriptive Payload
4. Biometric Payload

The general structure of a LEXS data item package is shown here:

```
<ulex:DataItemPackage>
        <ulex:PackageMetadata>
            <!-- Data Item Metadata -->
        </ulex:PackageMetadata>
        <lexs:Digest>
            <!-- Digest -->
        </lexs:Digest>
        <ulex:StructuredPayload>
            <ulex:StructuredPayloadMetadata>
                <ulex:CommunityURI>http://cjis.fbi.gov/ebts/9.0</ulex:CommunityURI>
                <ulex:CommunityDescriptionText>FBI EBTS</ulex:CommunityDescriptionText>
                <ulex:CommunityVersionText>9.0</ulex:CommunityVersionText>
            </ulex:StructuredPayloadMetadata>
            <ulex:StructuredPayloadContent>
             <fbiebts:FBIEBTSRecord>
              <ebtsbio:DescriptiveData>
                <!-- Biographic Information -->
              </ebtsbio:DescriptiveData>
              <ebtsbio:TransactionData>
                <!-- Transaction-Related Information -->
              </ebtsbio:TransactionData>
             </fbiebts:FBIEBTSRecord>
            </ulex:StructuredPayloadContent>
        </ulex:StructuredPayload>
        <ulex:StructuredPayload>
            <ulex:StructuredPayloadMetadata>
                <ulex:CommunityURI>http://biometrics.nist.gov/standard/2-2008</ulex:CommunityURI>
                <ulex:CommunityDescriptionText>ANSI/NIST-ITL</ulex:CommunityDescriptionText>
                <ulex:CommunityVersionText>2-2008</ulex:CommunityVersionText>
            </ulex:StructuredPayloadMetadata>
            <itl:NISTBiometricInformationExchangePackage>
```

```
                    <!-- Biometric Payload in standard ITL structure -->
                </itl:NISTBiometricInformationExchangePackage>
            </ulex:StructuredPayload>
            <ulex:Linkages>
                <!-- links between the payload and the digest -->
            </ulex:Linkages>
</ulex:DataItemPackage>
```

4.1 Data Item Metadata

The metadata section of a data item, contained within a ulex:PackageMetadata element, contains information about the data item, such as its identifier. One ANSI/NIST-ITL Type 1 field is included in the metadata section, namely:

FBI EBTS Field	LEXS Metadata Element
TCN (1.009 -- Transaction Control Number)	ulex:DataItemID

4.2 Digest

The LEXS digest, contained within a lexs:Digest element, is used for biographic and case information that pertain to an EBTS transaction. The digest has a fixed schema for all LEXS IEPDs, allowing interoperability across IEPDs. LEXS has standard definitions for common entities such as person, activity and location, as well as associations between them. For a complete description of LEXS digest structure, see the LEXS 4.0 User Guide. For a complete mapping of FBI EBTS Type 2 fields to the LEXS digest, please see Section 5.2 of this document.

4.3 FBI EBTS Descriptive Payload

The FBI EBTS Descriptive Payload, contained within an ulex:StructuredPayloadContent element, is used for the biographic and transaction information that is not common enough to be described in the LEXS digest schema.

The ulex:StructuredPayloadMetadata element describes the type and origin of the payload definition. For FBI EBTS, it should use the following values:

```
<ulex:StructuredPayloadMetadata>
  <ulex:CommunityURI>http://cjis.fbi.gov/ebts/9.0</ulex:CommunityURI>
```

```
  <ulex:CommunityDescriptionText>FBI EBTS</ulex:CommunityDescriptionText>
  <ulex:CommunityVersionText>9.0</ulex:CommunityVersionText>
</ulex:StructuredPayloadMetadata>
```

It is a digest-aware payload, which means that entities in the payload are augmentations of entities in the digest. A ulexlib:SameAsConnection element is used to create a link between the extended entity in the payload and the base entity in the digest.

For example, in the digest, there is an activity that represents the arrest, as in:

```
<lexsdigest:EntityActivity>
   <nc:Activity s:id="Arrest1">
   <nc:ActivityCategoryText>Arrest</nc:ActivityCategoryText>
   <nc:ActivityDate>
    <nc:Date>1995-03-24</nc:Date>
   </nc:ActivityDate>
   </nc:Activity>
</lexsdigest:EntityActivity>
```

The LEXS digest does not allow for an element to represent Arrest Seal Indicator (2.2019) or Arrest Date Suffix (2.046). Therefore, in the FBI EBTS Descriptive Payload, there is an augmentation of the digest entity as follows:

```
<fbiebts:Arrest  s:id="ArrestP1">
   <fbiebts:ArrestAugmentation>
   <fbiebts:ArrestDateSuffixText>L</ebtsbio:ArrestDateSuffixText>
   <fbiebts:ArrestSealIndicator>false</ebtsbio:ArrestSealIndicator>
   </fbiebts:ArrestAugmentation>
</fbiebts:Arrest>
```

In the linkages section of the document (within the ulex:Linkages element), a link is created between the digest and the payload, as in:

```
<ulex:Linkages>
  <ulexlib:SameAsConnection>
    <ulexlib:DigestObjectReference ulexlib:validatingObjectReference="Arrest1"/>
    <ulexlib:StructuredPayloadObjectReference ulexlib:structuredPayloadReference="P1"
ulexlib:nonValidatingObjectReference="ArrestP1"/>
  </ulexlib:SameAsConnection>
```

```
</ulex:Linkages>
```

The ulexlib:validatingObjectReference attribute with the value "Arrest1" refers to the digest object, and the ulexlib:nonValidatingObjectReference with the value "ArrestP1" refers to the payload object.

As shown in the example above, the FBI EBTS Descriptive Payload has its own namespace, `http://cjis.fbi.gov/ebts/9.0`, which uses the prefix `fbiebts` in the samples.

4.4 Biometric Payload

The biometric payload, contained within an itl:NISTBiometricInformationExchangePackage element, consists of a complete ANSI/NIST-ITL 2-2008 transaction.

The ulex:StructuredPayloadMetadata element describes the type and origin of the payload definition. For the biometric payload, it should use the following values:

```
<ulex:StructuredPayloadMetadata>
  <ulex:CommunityURI>http://biometrics.nist.gov/standard/2-2008</ulex:CommunityURI>
  <ulex:CommunityDescriptionText>ANSI/NIST-ITL</ulex:CommunityDescriptionText>
  <ulex:CommunityVersionText>2-2008</ulex:CommunityVersionText>
</ulex:StructuredPayloadMetadata>
```

The Type 2 record is present (as required by ANSI/NIST-ITL) but empty except for the IDC field, as shown in the following example.

```
<itl:PackageDescriptiveTextRecord>
  <ansi-nist:RecordCategoryCode>02</ansi-nist:RecordCategoryCode>
  <!-- IDC 2.002-->
  <ansi-nist:ImageReferenceIdentification>
    <nc:IdentificationID>00</nc:IdentificationID>
  </ansi-nist:ImageReferenceIdentification>
</itl:PackageDescriptiveTextRecord>
```

A biometric payload (i.e. an ANSI/NIST-ITL transaction) will be used even for TOTs that do not include any biometric images. For example, a Subject Photo Request contains only the FBI Identifier (and optionally date of arrest) of the subject of interest. No images are included in the request. However, a biometric payload (with only Type 1 and Type 2 records) will be included in the request message in order to provide a structure for the transaction information, and to maintain consistency with the FBI EBTS 9.0 Binary standard.

The Type 9 (Minutia) records will contain FBI EBTS-specific extensions. All FBI EBTS extensions to ANSI/NIST-ITL will be in a separate namespace, `http://cjis.fbi.gov/ebts_itl/9.0`, which uses the prefix `fbiebtsitl` in the samples.

5. Structure of the IEPD

The LEXS FBI EBTS IEPD consists of multiple sets of schemas and other IEPD artifacts.

5.1 Schemas

Three sets of schemas are provided with the IEPD: LEXS, FBI EBTS, and ITL.

5.1.1 LEXS Schemas

The complete set of LEXS 4.0 schemas are included in the `lexs` subdirectory. LEXS 4.0 is based on NIEM 2.1 and therefore includes its own NIEM 2.1 subset.

5.1.2 FBI EBTS Descriptive Payload Schemas

The `fbiebts` subdirectory contains schemas for validating the FBI EBTS Descriptive Payload. It contains an FBI-EBTS specific extension schema, as well as a separate NIEM 2.1 subset to support it.

5.1.3 EBTS ITL Schemas

The `itl` subdirectory contains schemas for validating the biometric payload. It contains the complete set of ANSI/NIST-ITL 2-2008 schemas, whose distribution includes the entire set of NIEM 2.0 schemas. It also contains, in the `fbiebtsitl` subdirectory, an FBI-EBTS specific extension schema for the Type 9 extensions.

5.2 Samples

The IEPD includes samples of common transaction types. Each sample consists of three separate XML documents (where ## is a sequential number, TOT is the type of transaction, and Name is the name of the sample):

- **##-TOT-Name-Complete.xml** contains a complete LEXS message.
- **##-TOT-Name-Payload-FBIEBTSDesc.xml** contains the FBI EBTS descriptive payload only.
- **##-TOT-Name-Payload-Biometric.xml** contains the biometric payload only.

Providing separate XML documents for the payloads facilitates their validation by the schema subsets used to describe those payloads.

6. Complete Field Mapping

This section contains a complete mapping of FBI EBTS 9.0 Type 2 and Type 9 fields to their equivalent XML elements, along with examples.

6.1 Type 2 Mappings

2.003 (FFN)

XPath: fbiebts:LatentCase/fbiebts:FBIFileNumber

Example:

<fbiebts:FBIFileNumber>2537597861</fbiebts:FBIFileNumber>

2.004 (QDD)

XPath: fbiebts:QueryDepthCode

Example:

<fbiebts:QueryDepthCode>S</fbiebts:QueryDepthCode>

2.005 (RET)

XPath: ansi-nist:RecordRetentionIndicator

Example:

<ansi-nist:RecordRetentionIndicator>true</ansi-nist:RecordRetentionIndicator>

2.006 (ATN)

XPath: fbiebts:AttentionText

Example:

<fbiebts:AttentionText>SA J Q DOE,RM 11867</fbiebts:AttentionText>

2.007 (SCO)

XPath: ansi-nist:RecordForwardOrganizations/nc:OrganizationIdentification

Example:

```
<ansi-nist:RecordForwardOrganizations>
    <nc:OrganizationIdentification>
        <nc:IdentificationID>WV1000000</nc:IdentificationID>
    </nc:OrganizationIdentification>
</ansi-nist:RecordForwardOrganizations>
```

2.009 (OCA)

XPath:
lexsdigest:EntityActivity/nc:Activity[nc:ActivityCategoryText='OriginatorCase']/nc:ActivityIdentification

Example:

```
<lexsdigest:EntityActivity>
    <nc:Activity s:id="Case1">
        <nc:ActivityIdentification>
            <!-- OCA 2.009-->
            <nc:IdentificationID>Q880312465</nc:IdentificationID>
        </nc:ActivityIdentification>
        <nc:ActivityCategoryText>OriginatorCase</nc:ActivityCategoryText>
    </nc:Activity>
</lexsdigest:EntityActivity>
```

2.010 (CIN)

XPath: lexsdigest:EntityActivity/nc:Activity[nc:ActivityCategoryText='ContributorCase']

Example:

```
<lexsdigest:EntityActivity>
    <!--CIN 2.010-->
    <nc:Activity s:id="Contrib1">
        <nc:ActivityIdentification>
            <!-- CIN_ID 2.010BF-->
```

```
            <nc:IdentificationID>1963BRT715</nc:IdentificationID>
            <!-- CIN_PRE 2.010A-->
            <nc:IdentificationCategoryText>INCIDENT NUMBER</nc:IdentificationCategoryText>
        </nc:ActivityIdentification>
        <nc:ActivityCategoryText>ContributorCase</nc:ActivityCategoryText>
    </nc:Activity>
</lexsdigest:EntityActivity>
```

2.011 (CIX)

XPath: fbiebts:ContributorCase/fbiebts:ContributorCaseIdentificationExtensionNumber

Example:

```
<fbiebts:ContributorCase s:id="d1e641">
    <!--CIX 2.011-->

<fbiebts:ContributorCaseIdentificationExtensionNumber>0001</fbiebts:ContributorCaseIdentificationExtensionNumber>
</fbiebts:ContributorCase>
```

2.012 (LCN)

XPath:
lexsdigest:EntityActivity/nc:Activity[nc:ActivityCategoryText='LatentCase']/nc:ActivityIdentification

Example:

```
<lexsdigest:EntityActivity>
    <!--LCN 2.012-->
    <nc:Activity s:id="LC1">
        <nc:ActivityIdentification>
            <nc:IdentificationID>MX-12345678</nc:IdentificationID>
        </nc:ActivityIdentification>
        <nc:ActivityCategoryText>LatentCase</nc:ActivityCategoryText>
    </nc:Activity>
</lexsdigest:EntityActivity>
```

2.013 (LCX)

XPath: fbiebts:LatentCase/fbiebts:FBILatentCaseExtensionNumber

Example:

```
<fbiebts:FBILatentCaseExtensionNumber>0001</fbiebts:FBILatentCaseExtensionNumber>
```

2.014 (FBI)

XPath:
lexsdigest:EntityPerson/lexsdigest:Person/j:PersonAugmentation/j:PersonFBIIdentification

Example:

```
<j:PersonFBIIdentification>
    <nc:IdentificationID>62760NY12</nc:IdentificationID>
</j:PersonFBIIdentification>
```

2.015 (SID)

XPath:
lexsdigest:EntityPerson/lexsdigest:Person/j:PersonAugmentation/j:PersonStateFingerprintIdentification

Example:

```
<j:PersonStateFingerprintIdentification>
    <nc:IdentificationID>WI0123456</nc:IdentificationID>
</j:PersonStateFingerprintIdentification>
```

2.016 (SOC)

XPath: lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonSSNIdentification

Example:

```
<nc:PersonSSNIdentification>
    <nc:IdentificationID>220-56-5855</nc:IdentificationID>
</nc:PersonSSNIdentification>
```

2.017 (MNU)

XPath:
lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonOtherIdentification[nc:IdentificationCategoryText=('AF', 'AN', 'AR', 'AS', 'BF', 'CI', 'CG', 'IO', 'MC', 'MD', 'MP', 'NA', 'NS', 'OA', 'PI', 'PP', 'PS', 'SS', 'VA')]

Example:

```
<nc:PersonOtherIdentification>
    <nc:IdentificationID>PP-1234567890P</nc:IdentificationID>
    <nc:IdentificationCategoryText>AF</nc:IdentificationCategoryText>
</nc:PersonOtherIdentification>
```

2.018 (NAM)

XPath: lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonName

Example:

```
<nc:PersonName s:id="Name1">
    <!--NAM 2.018-->
    <nc:PersonGivenName>ANTHONY</nc:PersonGivenName>
    <nc:PersonMiddleName>PAUL</nc:PersonMiddleName>
    <nc:PersonSurName>JONES</nc:PersonSurName>
</nc:PersonName>
```

2.019 (AKA)

XPath: lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonAlternateName

Example:

```
<nc:PersonAlternateName>
    <nc:PersonGivenName>TONY</nc:PersonGivenName>
    <nc:PersonSurName>JONES</nc:PersonSurName>
</nc:PersonAlternateName>
```

2.020 (POB)

XPath: j:PersonBirthPlaceCode

Example:

```
<j:PersonBirthPlaceCode>VA</j:PersonBirthPlaceCode>
```

2.021 (CTZ)

XPath: fbiebts:Person/fbiebts:PersonCitizenshipCode

Example:

```
<fbiebts:PersonCitizenshipCode>US</fbiebts:PersonCitizenshipCode>
```

2.022 (DOB)

XPath: lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonBirthDate

Example:

```
<nc:PersonBirthDate>
    <nc:Date>1977-08-25</nc:Date>
</nc:PersonBirthDate>
```

2.023 (AGR)

XPath: lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonAgeMeasure

Example:

```
<nc:PersonAgeMeasure>
    <nc:MeasureRangeValue>
        <nc:RangeMinimumValue>25</nc:RangeMinimumValue>
        <nc:RangeMaximumValue>30</nc:RangeMaximumValue>
    </nc:MeasureRangeValue>
</nc:PersonAgeMeasure>
```

2.024 (SEX)

XPath: fbiebts:Person/fbiebts:PersonSexCode

Example:

```
<fbiebts:PersonSexCode>M</fbiebts:PersonSexCode>
```

2.025 (RAC)

XPath: lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonRaceCode

Example:

```
<nc:PersonRaceCode>W</nc:PersonRaceCode>
```

2.026 (SMT)

XPath: fbiebts:Person/nc:PersonPhysicalFeature/nc:PhysicalFeatureCategoryCode

Example:

```
<nc:PersonPhysicalFeature>
    <!-- SMT 2.026-->
    <nc:PhysicalFeatureCategoryCode>MISS TOE</nc:PhysicalFeatureCategoryCode>
</nc:PersonPhysicalFeature>
```

2.027 (HGT)

XPath:
lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonHeightMeasure/nc:MeasurePointValue

Example:

```
<nc:PersonHeightMeasure>
    <nc:MeasurePointValue>601</nc:MeasurePointValue>
</nc:PersonHeightMeasure>
```

2.028 (HTR)

XPath:
lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonHeightMeasure/nc:MeasureRangeValue

Example:

```
<nc:PersonHeightMeasure>
    <nc:MeasurePointValue>601</nc:MeasurePointValue>
```

```
</nc:PersonHeightMeasure>
```

2.029 (WGT)

XPath:
lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonWeightMeasure/nc:MeasurePointValue

Example:

```
<nc:PersonWeightMeasure>
    <nc:MeasurePointValue>182</nc:MeasurePointValue>
</nc:PersonWeightMeasure>
```

2.030 (WTR)

XPath:
lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonWeightMeasure/nc:MeasureRangeValue

Example:

```
<nc:PersonWeightMeasure>
    <nc:MeasurePointValue>182</nc:MeasurePointValue>
</nc:PersonWeightMeasure>
```

2.031 (EYE)

XPath: lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonEyeColorCode

Example:

```
<nc:PersonEyeColorCode>BLU</nc:PersonEyeColorCode>
```

2.032 (HAI)

XPath: fbiebts:Person/fbiebts:PersonHairColorCode

Example:

```
<fbiebts:PersonHairColorCode>BRO</fbiebts:PersonHairColorCode>
```

2.033 (FPC)

XPath:
fbiebts:PersonFingerprintSet/fbiebts:FingerprintImageFinger/fbiebts:NCICFingerprintClassificationCode

Example:

```
<fbiebts:NCICFingerprintClassificationCode>PI</fbiebts:NCICFingerprintClassificationCode>
```

2.034 (PAT)

XPath:
fbiebts:PersonFingerprintSet/fbiebts:FingerprintImageFinger/fbiebts:FingerprintPatternClassificationCode

Example:

```
<fbiebts:FingerprintImageFinger>
    <!--FGP 2.074 / 2.034A / 2.091A / 2.092A-->
    <ansi-nist:FingerPositionCode>3</ansi-nist:FingerPositionCode>
    <!--FPC 2.033-->
    <fbiebts:NCICFingerprintClassificationCode>PI</fbiebts:NCICFingerprintClassificationCode>
    <!--PATCL 2.034B -->
    <fbiebts:FingerprintPatternClassificationCode>LS</fbiebts:FingerprintPatternClassificationCode>
    <fbiebts:FingerprintRidgeCoreDelta>
        <!--RCN1 2.091B-->
        <fbiebts:FingerprintRidgeCountValue>11</fbiebts:FingerprintRidgeCountValue>
    </fbiebts:FingerprintRidgeCoreDelta>
    <fbiebts:FingerprintRidgeCoreDelta>
        <!--RCN2 2.092B-->
        <fbiebts:FingerprintRidgeCountValue>0</fbiebts:FingerprintRidgeCountValue>
    </fbiebts:FingerprintRidgeCoreDelta>
</fbiebts:FingerprintImageFinger>
```

2.035 (PPA)

XPath:
fbiebts:Person/j:PersonAugmentation/j:PersonPalmPrint/nc:BiometricImage/nc:BinaryAvailableIndicator

Example:

```
<j:PersonPalmPrint>
    <nc:BiometricImage>
        <!-- PPA 2.035-->
        <nc:BinaryAvailableIndicator>true</nc:BinaryAvailableIndicator>
    </nc:BiometricImage>
</j:PersonPalmPrint>
```

2.036 (PHT)

XPath: fbiebts:Person/nc:PersonDigitalImage/nc:BinaryAvailableIndicator

Example:

```
<nc:PersonDigitalImage>
    <nc:BinaryAvailableIndicator>true</nc:BinaryAvailableIndicator>
</nc:PersonDigitalImage>
```

2.037 (RFP)

XPath:
lexsdigest:EntityActivity/nc:Activity[nc:ActivityCategoryText='Fingerprinting']/nc:ActivityDescriptionText

Example:

```
<lexsdigest:EntityActivity>
    <nc:Activity s:id="Print1">
        <nc:ActivityCategoryText>Fingerprinting</nc:ActivityCategoryText>
        <!--DPR 2.038-->
        <nc:ActivityDate>
            <nc:Date>2006-12-12</nc:Date>
        </nc:ActivityDate>
        <!-- RFP 2.037-->
        <nc:ActivityDescriptionText>CONSIDERING FOR
EMPLOYMENT</nc:ActivityDescriptionText>
    </nc:Activity>
</lexsdigest:EntityActivity>
```

2.038 (DPR)

XPath:
lexsdigest:EntityActivity/nc:Activity[nc:ActivityCategoryText='Fingerprinting']/nc:ActivityDate

Example:

```
<lexsdigest:EntityActivity>
    <nc:Activity s:id="Print1">
        <nc:ActivityCategoryText>Fingerprinting</nc:ActivityCategoryText>
        <!--DPR 2.038-->
        <nc:ActivityDate>
            <nc:Date>2006-12-12</nc:Date>
        </nc:ActivityDate>
        <!-- RFP 2.037-->
        <nc:ActivityDescriptionText>CONSIDERING FOR
EMPLOYMENT</nc:ActivityDescriptionText>
    </nc:Activity>
</lexsdigest:EntityActivity>
```

2.039 (EAD)

XPath:
lexsdigest:EntityLocation/nc:Location[@s:id=//nc:PersonEmploymentLocationAssociation/nc:LocationReference/@s:ref]/nc:LocationAddress/nc:AddressFullText

Example:

```
<lexsdigest:EntityLocation>
    <nc:Location s:id="Loc1">
        <nc:LocationAddress>
            <nc:AddressFullText>ACE CONSTRUCTION COMPANY, 327 MAPLE AVE, BUFFALO,
NY</nc:AddressFullText>
        </nc:LocationAddress>
    </nc:Location>
</lexsdigest:EntityLocation>
```

2.040 (OCP)

XPath: nc:PersonEmploymentAssociation/nc:EmployeeOccupationText

Example:

```
<nc:PersonEmploymentAssociation>
    <nc:EmployeeReference/>
    <!--OCP 2.040-->
    <nc:EmployeeOccupationText>PLUMBER</nc:EmployeeOccupationText>
</nc:PersonEmploymentAssociation>
```

2.041 (RES)

XPath:
lexsdigest:EntityLocation/nc:Location[@s:id=//nc:ResidenceAssociation/nc:LocationReference/@s:ref]/nc:LocationAddress/nc:AddressFullText

Example:

```
<lexsdigest:EntityLocation>
    <nc:Location s:id="Loc3">
        <nc:LocationAddress>
            <nc:AddressFullText>5021 OAK LEAF DRIVE, BUFFALO, NY</nc:AddressFullText>
        </nc:LocationAddress>
    </nc:Location>
</lexsdigest:EntityLocation>
```

2.042 (MIL)

XPath: ansi-nist:TransactionSubmissionMilitaryCode

Example:

```
<ansi-nist:TransactionSubmissionMilitaryCode>M</ansi-nist:TransactionSubmissionMilitaryCode>
```

2.043 (TSR)

XPath: fbiebts:SearchRequestCategoryCode

Example:

```
<fbiebts:SearchRequestCategoryCode>P</fbiebts:SearchRequestCategoryCode>
```

2.044 (GEO)

XPath: fbiebts:SearchAreaCode

Example:

```
<fbiebts:SearchAreaCode>WV</fbiebts:SearchAreaCode>
```

2.045 (DOA)

XPath: lexsdigest:EntityActivity/nc:Activity[nc:ActivityCategoryText='Arrest']/nc:ActivityDate

Example:

```
<lexsdigest:EntityActivity>
    <nc:Activity s:id="Arrest1">
        <nc:ActivityIdentification>
            <!-- FUTURE CAPABILITY SAN 2.099 -->
            <nc:IdentificationID>WV0004312</nc:IdentificationID>
            <nc:IdentificationCategoryText>Arrest Sequence ID</nc:IdentificationCategoryText>
        </nc:ActivityIdentification>
        <nc:ActivityCategoryText>Arrest</nc:ActivityCategoryText>
        <!-- DOA 2.045 -->
        <nc:ActivityDate>
            <nc:Date>2006-12-12</nc:Date>
        </nc:ActivityDate>
    </nc:Activity>
</lexsdigest:EntityActivity>
```

2.046 (DOS)

XPath: fbiebts:Arrest/fbiebts:ArrestDateSuffixText

Example:

```
<fbiebts:ArrestDateSuffixText>L</fbiebts:ArrestDateSuffixText>
```

2.047 (ASL)

XPath: lexsdigest:EntityActivity/nc:Activity[nc:ActivityCategoryText='Offense']

Example:

```
<lexsdigest:EntityActivity>
    <nc:Activity s:id="Offense1">
        <nc:ActivityCategoryText>Offense</nc:ActivityCategoryText>
        <!-- DOO 2.047A-->
        <nc:ActivityDate>
            <nc:Date>2006-12-12</nc:Date>
        </nc:ActivityDate>
        <!--AOL 2.047B-->
        <nc:ActivityDescriptionText>DUI</nc:ActivityDescriptionText>
```

```
    </nc:Activity>
</lexsdigest:EntityActivity>
```

2.048 (CSR)

XPath: fbiebts:CivilSearchRequestIndicator

Example:

```
<fbiebts:CivilSearchRequestIndicator>true</fbiebts:CivilSearchRequestIndicator>
```

2.049 (EID)

XPath: fbiebts:FederalEmployeeIdentification

Example:

```
<fbiebts:FederalEmployeeIdentification>
    <nc:IdentificationID>12345</nc:IdentificationID>
</fbiebts:FederalEmployeeIdentification>
```

2.051 (CSL)

XPath: fbiebts:Offense/j:Charge

Example:

```
<j:Charge>
    <j:ChargeDisposition>
        <!--CDD 2.051A-->
        <nc:DispositionDate>
            <nc:Date>2006-12-28</nc:Date>
        </nc:DispositionDate>
        <!--CPL 2.051C-->
        <j:ChargeDispositionOtherText>5 DAYS JAIL, PAY COURT
COSTS</j:ChargeDispositionOtherText>
    </j:ChargeDisposition>
    <!--COL 2.051B-->
    <j:ChargeText>DUI</j:ChargeText>
</j:Charge>
```

2.052 (*tbd)

XPath: fbiebts:RapBackRequestCode

Example:

```
<fbiebts:RapBackRequestCode>1</fbiebts:RapBackRequestCode>
```

2.053 (OFC)

XPath: fbiebts:Offense/fbiebts:OffenseCategoryCode

Example:

```
<fbiebts:OffenseCategoryCode>3</fbiebts:OffenseCategoryCode>
```

2.054 (SSD)

XPath:
lexsdigest:EntityActivity/nc:Activity[nc:ActivityCategoryText='Supervision']/nc:ActivityDate

Example:

```
<lexsdigest:EntityActivity>
    <nc:Activity s:id="Super1">
        <nc:ActivityCategoryText>Supervision</nc:ActivityCategoryText>
        <!-- SSD 2.054-->
        <nc:ActivityDate>
            <nc:Date>2007-01-01</nc:Date>
        </nc:ActivityDate>
        <!-- SLE 2.055-->
        <nc:ActivityDescriptionText>ARMED AND DANGEROUS</nc:ActivityDescriptionText>
    </nc:Activity>
</lexsdigest:EntityActivity>
```

2.055 (SLE)

XPath:
lexsdigest:EntityActivity/nc:Activity[nc:ActivityCategoryText='Supervision']/nc:ActivityDescriptionText

Example:

```
<lexsdigest:EntityActivity>
    <nc:Activity s:id="Super1">
        <nc:ActivityCategoryText>Supervision</nc:ActivityCategoryText>
        <!-- SSD 2.054-->
        <nc:ActivityDate>
            <nc:Date>2007-01-01</nc:Date>
        </nc:ActivityDate>
        <!-- SLE 2.055-->
        <nc:ActivityDescriptionText>ARMED AND DANGEROUS</nc:ActivityDescriptionText>
    </nc:Activity>
</lexsdigest:EntityActivity>
```

2.056 (ICO)

XPath: fbiebts:Person/nc:PersonDescriptionText

Example:

```
<nc:PersonDescriptionText>ARMED AND DANGEROUS</nc:PersonDescriptionText>
```

2.057 (FNR)

XPath: fbiebts:FingerprintImagesRequested/ansi-nist:FingerPositionCode

Example:

```
<fbiebts:FingerprintImagesRequested>
    <ansi-nist:FingerPositionCode>6</ansi-nist:FingerPositionCode>
    <ansi-nist:FingerPositionCode>10</ansi-nist:FingerPositionCode>
</fbiebts:FingerprintImagesRequested>
```

2.059 (SRF)

XPath: fbiebts:SearchResultsCode

Example:

```
<fbiebts:SearchResultsCode>I</fbiebts:SearchResultsCode>
```

2.060 (MSG)

XPath: fbiebts:StatusText

Example:

```
<fbiebts:StatusText>MATCH MADE AGAINST SUBJECTS FINGERPRINTS ON 05/01/94. PLEASE NOTIFY
```

2.061 (CST)

XPath: fbiebts:LatentCase/nc:CaseTitleText

Example:

```
<nc:CaseTitleText>ARMED ROBBERY FIRST COUNTY</nc:CaseTitleText>
```

2.062 (IMT)

XPath: fbiebts:TransactionData//fbiebts:LatentImageCategoryCode

Example:

```
<fbiebts:LatentImageCategoryCode>1</fbiebts:LatentImageCategoryCode>
```

2.063 (PTD)

XPath: j:Suspect|//j:Victim|//lexsdigest:OtherInvolvedPerson|//fbiebts:EliminatedPerson

Example:

```
<j:Suspect>
    <nc:RoleOfPersonReference s:ref="Per1"/>
</j:Suspect>
```

2.064 (CAN)

XPath: fbiebts:CandidateList/fbiebts:Candidate

Example:

```
<fbiebts:Candidate>
    <nc:PersonName>
        <!--NAM 2.064B-->
        <nc:PersonFullName>JONES, ANTHONY PAUL</nc:PersonFullName>
    </nc:PersonName>
    <!-- FNU 2.064A-->
    <j:PersonFBIIdentification>
        <nc:IdentificationID>62760NY12</nc:IdentificationID>
    </j:PersonFBIIdentification>
    <!--MSC 2.089-->
    <fbiebts:CandidateMatchScoreValue>1200</fbiebts:CandidateMatchScoreValue>
    <!--FGP 2.074-->
    <fbiebts:CandidateFingerPositionImagesAvailable>
        <ansi-nist:FingerPositionCode>6</ansi-nist:FingerPositionCode>
        <ansi-nist:FingerPositionCode>10</ansi-nist:FingerPositionCode>
    </fbiebts:CandidateFingerPositionImagesAvailable>
</fbiebts:Candidate>
```

2.065 (RSR)

XPath: fbiebts:RepositoryResponse

Example:

```
<fbiebts:RepositoryResponse>
    <fbiebts:RepositoryParameter>
        <fbiebts:RepositoryParameterNameText>EYE</fbiebts:RepositoryParameterNameText>
        <fbiebts:RepositoryParameterValueText>BLUE</fbiebts:RepositoryParameterValueText>
        <fbiebts:RepositoryParameterPercentage>.321</fbiebts:RepositoryParameterPercentage>
    </fbiebts:RepositoryParameter>
    <fbiebts:RepositoryParameter>
        <fbiebts:RepositoryParameterNameText>HAI</fbiebts:RepositoryParameterNameText>
        <fbiebts:RepositoryParameterValueText>BRN</fbiebts:RepositoryParameterValueText>
        <fbiebts:RepositoryParameterPercentage>.5</fbiebts:RepositoryParameterPercentage>
    </fbiebts:RepositoryParameter>
</fbiebts:RepositoryResponse>
```

2.067 (IMA)

XPath: fbiebts:TransactionData/ansi-nist:ImageCaptureDetail

Example:

```
<ansi-nist:ImageCaptureDetail>
    <!--MAK 2.067A-->
```

```
    <ansi-nist:CaptureDeviceMakeText>DBI</ansi-nist:CaptureDeviceMakeText>
    <!--MODL 2.067B-->
    <ansi-nist:CaptureDeviceModelText>1134</ansi-nist:CaptureDeviceModelText>
    <!--SERNO 2.067C-->
    <ansi-nist:CaptureDeviceSerialNumberText>12345</ansi-nist:CaptureDeviceSerialNumberText>
</ansi-nist:ImageCaptureDetail>
```

2.069 (ETC)

XPath: fbiebts:EstimatedCompletionTimeQuantity

Example:

```
<fbiebts:EstimatedCompletionTimeQuantity>6270</fbiebts:EstimatedCompletionTimeQuantity>
```

2.070 (RAP)

XPath: ansi-nist:RecordRapSheetRequestIndicator

Example:

```
<ansi-nist:RecordRapSheetRequestIndicator>true</ansi-nist:RecordRapSheetRequestIndicator>
```

2.071 (ACN)

XPath: fbiebts:ActionText

Example:

```
<fbiebts:ActionText>IF NON-IDENT, SUBMIT TO UNSOLVED LATENT FILE</fbiebts:ActionText>
```

2.072 (FIU)

XPath: fbiebts:FingerprintImagesUpdated/ansi-nist:FingerPositionCode

Example:

```
<fbiebts:FingerprintImagesUpdated>
    <ansi-nist:FingerPositionCode>2</ansi-nist:FingerPositionCode>
    <ansi-nist:FingerPositionCode>5</ansi-nist:FingerPositionCode>
```

```
    <ansi-nist:FingerPositionCode>7</ansi-nist:FingerPositionCode>
    <ansi-nist:FingerPositionCode>8</ansi-nist:FingerPositionCode>
    <ansi-nist:FingerPositionCode>1</ansi-nist:FingerPositionCode>
    <ansi-nist:FingerPositionCode>13</ansi-nist:FingerPositionCode>
</fbiebts:FingerprintImagesUpdated>
```

2.073 (CRI)

XPath:
ulex:SRMessageMetadata/ulex:SRMessageMetadataDomainAttribute/fbiebts:ControllingAgency List/fbiebts:ControllingAgencyID

Example:

```
<fbiebts:ControllingAgencyID>WI0050200</fbiebts:ControllingAgencyID>
```

2.074 (FGP)

XPath: fbiebts:PersonFingerprintSet/fbiebts:FingerprintImageFinger/ansi-nist:FingerPositionCode

Example:

```
<ansi-nist:FingerPositionCode>1</ansi-nist:FingerPositionCode>
```

2.076 (PRI)

XPath: fbiebts:SearchPriorityCode

Example:

```
<fbiebts:SearchPriorityCode>2</fbiebts:SearchPriorityCode>
```

2.077 (CFS)

XPath: fbiebts:CancelFingerprintSearchIdentification

Example:

```
<fbiebts:CancelFingerprintSearchIdentification>
```

```
    <nc:IdentificationID>1</nc:IdentificationID>
</fbiebts:CancelFingerprintSearchIdentification>
```

2.078 (PEN)

XPath: fbiebts:PenetrationQueryResponsePercentage

Example:

```
<fbiebts:PenetrationQueryResponsePercentage>.10</fbiebts:PenetrationQueryResponsePercentage>
```

2.079 (NCR)

XPath: fbiebts:ImagesRequestedQuantity

Example:

```
<fbiebts:ImagesRequestedQuantity>20</fbiebts:ImagesRequestedQuantity>
```

2.080 (EXP)

XPath: fbiebts:ResponseExplanationText

Example:

```
<fbiebts:ResponseExplanationText>PHOTO NOT FOUND FOR SPECIFIED      DOA
DOS</fbiebts:ResponseExplanationText>
```

2.081 (UCN)

XPath:
lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonOtherIdentification[nc:IdentificationCategoryText='Universal Control Number']

Example:

```
<nc:PersonOtherIdentification>
    <nc:IdentificationID>UC-12345678</nc:IdentificationID>
    <nc:IdentificationCategoryText>Universal Control Number</nc:IdentificationCategoryText>
</nc:PersonOtherIdentification>
```

2.082 (REC)

XPath: fbiebts:ResponseIndicator

Example:

```
<fbiebts:ResponseIndicator>true</fbiebts:ResponseIndicator>
```

2.083 (ULF)

XPath: fbiebts:UnsolvedLatentFileIndicator

Example:

```
<fbiebts:UnsolvedLatentFileIndicator>true</fbiebts:UnsolvedLatentFileIndicator>
```

2.084 (AMP)

XPath:
fbiebts:PersonFingerprintSet/fbiebts:FingerprintImageFinger[fbiebts:FingerprintMissingReason Code]

Example:

```
<fbiebts:FingerprintImageFinger>
    <!--AMP 2.084-->
    <ansi-nist:FingerPositionCode>1</ansi-nist:FingerPositionCode>
    <fbiebts:FingerprintMissingReasonCode>XX</fbiebts:FingerprintMissingReasonCode>
</fbiebts:FingerprintImageFinger>
```

2.085 (CRN)

XPath:
lexsdigest:EntityPerson/lexsdigest:Person/nc:PersonOtherIdentification[nc:IdentificationCategoryText='Civil Record Identification']

Example:

```
<nc:PersonOtherIdentification>
```

```
    <nc:IdentificationID>V12345678</nc:IdentificationID>
    <nc:IdentificationCategoryText>Civil Record Identification</nc:IdentificationCategoryText>
</nc:PersonOtherIdentification>
```

2.086 (SCNA)

XPath: fbiebts:AFISSegmentControlNumberIdentification

Example:

```
<fbiebts:AFISSegmentControlNumberIdentification>
    <nc:IdentificationID>3124</nc:IdentificationID>
</fbiebts:AFISSegmentControlNumberIdentification>
```

2.087 (TAA)

XPath: fbiebts:Person/fbiebts:PersonAugmentation/fbiebts:PersonAdultTreatmentIndicator

Example:

```
<fbiebts:PersonAdultTreatmentIndicator>true</fbiebts:PersonAdultTreatmentIndicator>
```

2.088 (NOT)

XPath: fbiebts:NoteText

Example:

```
<fbiebts:NoteText>THIS FREE-TEXT FIELD IS USED TO PROVIDE ADDITIONAL
INFORMATION REGARDING ELECTRONIC LATENT SUBMISSIONS</fbiebts:NoteText>
```

2.089 (MSC)

XPath: fbiebts:CandidateMatchScoreValue

Example:

```
<fbiebts:CandidateMatchScoreValue>1200</fbiebts:CandidateMatchScoreValue>
```

2.091 (RCD1)

XPath:
fbiebts:PersonFingerprintSet/fbiebts:FingerprintImageFinger/fbiebts:FingerprintRidgeCoreDelta[1]

Example:

```
<fbiebts:FingerprintImageFinger>
    <!--FGP 2.074 / 2.034A / 2.091A / 2.092A-->
    <ansi-nist:FingerPositionCode>3</ansi-nist:FingerPositionCode>
    <!--FPC 2.033-->
    <fbiebts:NCICFingerprintClassificationCode>PI</fbiebts:NCICFingerprintClassificationCode>
    <!--PATCL 2.034B -->
    <fbiebts:FingerprintPatternClassificationCode>LS</fbiebts:FingerprintPatternClassificationCode>
    <fbiebts:FingerprintRidgeCoreDelta>
        <!--RCN1 2.091B-->
        <fbiebts:FingerprintRidgeCountValue>11</fbiebts:FingerprintRidgeCountValue>
    </fbiebts:FingerprintRidgeCoreDelta>
    <fbiebts:FingerprintRidgeCoreDelta>
        <!--RCN2 2.092B-->
        <fbiebts:FingerprintRidgeCountValue>0</fbiebts:FingerprintRidgeCountValue>
    </fbiebts:FingerprintRidgeCoreDelta>
</fbiebts:FingerprintImageFinger>
```

2.092 (RCD2)

XPath: fbiebts:FingerprintImageFinger/fbiebts:FingerprintRidgeCoreDelta[2]

Example:

```
<fbiebts:FingerprintImageFinger>
    <!--FGP 2.074 / 2.034A / 2.091A / 2.092A-->
    <ansi-nist:FingerPositionCode>3</ansi-nist:FingerPositionCode>
    <!--FPC 2.033-->
    <fbiebts:NCICFingerprintClassificationCode>PI</fbiebts:NCICFingerprintClassificationCode>
    <!--PATCL 2.034B -->
    <fbiebts:FingerprintPatternClassificationCode>LS</fbiebts:FingerprintPatternClassificationCode>
    <fbiebts:FingerprintRidgeCoreDelta>
        <!--RCN1 2.091B-->
        <fbiebts:FingerprintRidgeCountValue>11</fbiebts:FingerprintRidgeCountValue>
    </fbiebts:FingerprintRidgeCoreDelta>
    <fbiebts:FingerprintRidgeCoreDelta>
        <!--RCN2 2.092B-->
        <fbiebts:FingerprintRidgeCountValue>0</fbiebts:FingerprintRidgeCountValue>
    </fbiebts:FingerprintRidgeCoreDelta>
```

```
</fbiebts:FingerprintImageFinger>
```

2.093 (SPCN)

XPath: fbiebts:SpecialPopulationCognizantFileIdentification

Example:

```
<fbiebts:SpecialPopulationCognizantFileIdentification>
    <nc:IdentificationID>SP123456</nc:IdentificationID>
</fbiebts:SpecialPopulationCognizantFileIdentification>
```

2.094 (CCN)

XPath: fbiebts:Offense/fbiebts:CourtCaseIdentification

Example:

```
<fbiebts:CourtCaseIdentification>
    <!-- FUTURE CAPABILITY CCN 2.094 -->
    <nc:IdentificationID>C123456</nc:IdentificationID>
</fbiebts:CourtCaseIdentification>
```

2.095 (RFR)

XPath: fbiebts:FeaturesRequestIndicator

Example:

```
<fbiebts:FeaturesRequestIndicator>true</fbiebts:FeaturesRequestIndicator>
```

2.096 (RPR)

XPath: fbiebts:PhotoRequestIndicator

Example:

```
<fbiebts:PhotoRequestIndicator>true</fbiebts:PhotoRequestIndicator>
```

2.098 (NDR)

XPath: fbiebts:FBIRepositoryCode

Example:

```
<fbiebts:FBIRepositoryCode>1</fbiebts:FBIRepositoryCode>
```

2.099 (SAN)

XPath:
lexsdigest:EntityActivity/nc:Activity[nc:ActivityCategoryText='Arrest']/nc:ActivityIdentification

Example:

```
<lexsdigest:EntityActivity>
    <nc:Activity s:id="Arrest1">
        <nc:ActivityIdentification>
            <!-- FUTURE CAPABILITY SAN 2.099 -->
            <nc:IdentificationID>WV0004312</nc:IdentificationID>
            <nc:IdentificationCategoryText>Arrest Sequence ID</nc:IdentificationCategoryText>
        </nc:ActivityIdentification>
        <nc:ActivityCategoryText>Arrest</nc:ActivityCategoryText>
        <!-- DOA 2.045 -->
        <nc:ActivityDate>
            <nc:Date>2006-12-12</nc:Date>
        </nc:ActivityDate>
    </nc:Activity>
</lexsdigest:EntityActivity>
```

2.2001 (NAM1)

XPath:
fbiebts:Person/fbiebts:PersonName/fbiebts:PersonNameAugmentation/fbiebts:ExtendedName[1]

Example:

```
<fbiebts:ExtendedName>Person</fbiebts:ExtendedName>
```

2.2002 (NAM2)

XPath:
fbiebts:Person/fbiebts:PersonName/fbiebts:PersonNameAugmentation/fbiebts:ExtendedName[2]

Example:

<fbiebts:ExtendedName>With</fbiebts:ExtendedName>

2.2003 (NAM3)

XPath:
fbiebts:Person/fbiebts:PersonName/fbiebts:PersonNameAugmentation/fbiebts:ExtendedName[3]

Example:

<fbiebts:ExtendedName>Very</fbiebts:ExtendedName>

2.2004 (NAM4)

XPath:
fbiebts:Person/fbiebts:PersonName/fbiebts:PersonNameAugmentation/fbiebts:ExtendedName[4]

Example:

<fbiebts:ExtendedName>Many</fbiebts:ExtendedName>

2.2005 (NAM5)

XPath:
fbiebts:Person/fbiebts:PersonName/fbiebts:PersonNameAugmentation/fbiebts:ExtendedName[5]

Example:

<fbiebts:ExtendedName>Names</fbiebts:ExtendedName>

2.2006 (CSF)

XPath: fbiebts:CascadedSearchCode

Example:

```
<fbiebts:CascadedSearchCode>CR</fbiebts:CascadedSearchCode>
```

2.2007 (SDOB)

XPath: fbiebts:Person/fbiebts:PersonAugmentation/fbiebts:PersonSubmittedBirthDate

Example:

```
<fbiebts:PersonSubmittedBirthDate>
    <nc:Date>2008-04-22</nc:Date>
</fbiebts:PersonSubmittedBirthDate>
```

2.2008 (SNAM)

XPath: fbiebts:Person/fbiebts:PersonAugmentation/fbiebts:PersonSubmittedName

Example:

```
<fbiebts:PersonSubmittedName>
    <nc:PersonFullName>Public, John Q</nc:PersonFullName>
</fbiebts:PersonSubmittedName>
```

2.2009 (PTY)

XPath: fbiebts:TransactionData//ansi-nist:ImageCategoryCode

Example:

```
<ansi-nist:ImageCategoryCode>FACE</ansi-nist:ImageCategoryCode>
```

2.2010 (NIR)

XPath: fbiebts:SubjectPhotosRequestedQuantity

Example:

```
<fbiebts:SubjectPhotosRequestedQuantity>1</fbiebts:SubjectPhotosRequestedQuantity>
```

2.2011 (*tbd)

XPath: fbiebts:RapBackVerificationIndicator

Example:

<fbiebts:RapBackVerificationIndicator>true</fbiebts:RapBackVerificationIndicator>

2.2012 (IIR)

XPath: fbiebts:IrisImagesRequestedCode

Example:

<fbiebts:IrisImagesRequestedCode>0</fbiebts:IrisImagesRequestedCode>

2.2013 (DMI)

XPath: fbiebts:DispositionMaintenanceCode

Example:

<fbiebts:DispositionMaintenanceCode>A</fbiebts:DispositionMaintenanceCode>

2.2014 (*tbd)

XPath: fbiebts:RapBackEligibilityIndicator

Example:

<fbiebts:RapBackEligibilityIndicator>true</fbiebts:RapBackEligibilityIndicator>

2.2015 (*tbd)

XPath: fbiebts:RapBackExpirationDate

Example:

<fbiebts:RapBackExpirationDate>

```
    <nc:Date>2010-02-24</nc:Date>
</fbiebts:RapBackExpirationDate>
```

2.2016 (DNAF)

XPath: fbiebts:Person/nc:PersonDNA/nc:DNAImage/nc:BinaryAvailableIndicator

Example:

```
<nc:DNAImage>
    <nc:BinaryAvailableIndicator>true</nc:BinaryAvailableIndicator>
</nc:DNAImage>
```

2.2017 (DORI)

XPath:
fbiebts:Person/fbiebts:PersonAugmentation/fbiebts:PersonDNARepositoryOrganization/nc:OrganizationIdentification

Example:

```
<fbiebts:PersonDNARepositoryOrganization>
    <nc:OrganizationIdentification>
        <nc:IdentificationID>WI013415Y</nc:IdentificationID>
    </nc:OrganizationIdentification>
</fbiebts:PersonDNARepositoryOrganization>
```

2.2018 (DNAC)

XPath:
fbiebts:Person/fbiebts:PersonAugmentation/fbiebts:PersonBinaryCODISAvailableIndicator

Example:

```
<fbiebts:PersonBinaryCODISAvailableIndicator>false</fbiebts:PersonBinaryCODISAvailableIndicator>
```

2.2019 (SEAL)

XPath: fbiebts:Arrest/fbiebts:ArrestSealIndicator

Example:

```
<fbiebts:ArrestSealIndicator>false</fbiebts:ArrestSealIndicator>
```

2.2020 (*tbd)

XPath: fbiebts:RapBackRecipientOrganization

Example:

```
<fbiebts:RapBackRecipientOrganization>
    <nc:OrganizationIdentification>
        <nc:IdentificationID>WV0001234</nc:IdentificationID>
    </nc:OrganizationIdentification>
</fbiebts:RapBackRecipientOrganization>
```

2.2021 (IFS)

XPath: fbiebts:Person/j:PersonAugmentation/j:PersonFirearmSalesDisqualifiedCode

Example:

```
<j:PersonFirearmSalesDisqualifiedCode>D</j:PersonFirearmSalesDisqualifiedCode>
```

2.2022 (CIDN)

XPath: fbiebts:ContributorAssignedIdentification

Example:

```
<fbiebts:ContributorAssignedIdentification>
    <nc:IdentificationID>1231232</nc:IdentificationID>
</fbiebts:ContributorAssignedIdentification>
```

6.2 Type 7 Mappings

7.002 (IDC)

XPath: itl:PackageUserDefinedImageRecord/ansi-nist:ImageReferenceIdentification/nc:IdentificationID

Example:

```
<nc:IdentificationID>02</nc:IdentificationID>
```

7.003 (IMP)

XPath: itl:PackageUserDefinedImageRecord/ansi-nist:FingerprintImage/ansi-nist:FingerprintImageImpressionCaptureCategoryCode

Example:

```
<ansi-nist:FingerprintImageImpressionCaptureCategoryCode>3</ansi-nist:FingerprintImageImpressionCaptureCategoryCode>
```

7.004 (FGP)

XPath: itl:PackageUserDefinedImageRecord/ansi-nist:FingerprintImage/ansi-nist:FingerprintImagePosition/ansi-nist:FingerPositionCode

Example:

```
<ansi-nist:FingerPositionCode>2</ansi-nist:FingerPositionCode>
```

7.005 (ISR)

XPath: itl:PackageUserDefinedImageRecord/ansi-nist:FingerprintImage/ansi-nist:ImageCaptureDetail/ansi-nist:CaptureResolutionCode

Example:

```
<ansi-nist:CaptureResolutionCode>1</ansi-nist:CaptureResolutionCode>
```

7.006 (HLL)

XPath: itl:PackageUserDefinedImageRecord/ansi-nist:FingerprintImage/ansi-nist:ImageHorizontalLineLengthPixelQuantity

Example:

```
<ansi-nist:ImageHorizontalLineLengthPixelQuantity>80</ansi-nist:ImageHorizontalLineLengthPixelQuantity>
```

7.007 (VLL)

XPath: itl:PackageUserDefinedImageRecord/ansi-nist:FingerprintImage/ansi-nist:ImageVerticalLineLengthPixelQuantity

Example:

```
<ansi-nist:ImageVerticalLineLengthPixelQuantity>65</ansi-nist:ImageVerticalLineLengthPixelQuantity>
```

7.008 (CGA)

XPath: itl:PackageUserDefinedImageRecord/ansi-nist:FingerprintImage/ansi-nist:ImageCompressionAlgorithmCode

Example:

```
<ansi-nist:ImageCompressionAlgorithmCode>2</ansi-nist:ImageCompressionAlgorithmCode>
```

7.009 (IMG)

XPath: itl:PackageUserDefinedImageRecord/ansi-nist:FingerprintImage/nc:BinaryBase64Object

Example:

```
<nc:BinaryBase64Object>mrHbPdrko3u1s7ahtgPBjtmO1s85tfG2U7bpofY9
4Czu2SbY7d7wF9fQ7ZptgGrtkO2a2dsJ7wZbe 8BlzvAmQ7xq+Y94GoHeEsR3ikWd4DIGhzmp3k42
d4DRmzs94DKveDTB3hqw6PeBLrtpPep0H/+h </nc:BinaryBase64Object>
```

6.3 Type 9 Mappings

9.003 (IMP)

9.003 (IMP)

XPath: itl:PackageMinutiaeRecord/ansi-nist:MinutiaeImpressionCaptureCategoryCode

Example:

```
<ansi-nist:MinutiaeImpressionCaptureCategoryCode>4</ansi-
nist:MinutiaeImpressionCaptureCategoryCode>
```

9.004 (FMT)

XPath: itl:PackageMinutiaeRecord/ansi-nist:MinutiaeFormatNISTStandardIndicator

Example:

```
<ansi-nist:MinutiaeFormatNISTStandardIndicator>false</ansi-
nist:MinutiaeFormatNISTStandardIndicator>
```

9.013 (AFV)

XPath: itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/nc:BinaryBase64Object

Example:

```
<nc:BinaryBase64Object>mrHbPdrko3u1s7ahtgPBjtmO1s85tfG2U7bpofY9
4Czu2SbY7d7wF9fQ7ZptgGrtkO2a2dsJ7wZbe 8BlzvAmQ7xq+Y94GoHeEsR3ikWd4DIGhzmp3k42
d4DRmzs94DKveDTB3hqw6PeBLrtpPep0H/+h </nc:BinaryBase64Object>
```

9.014 (FGN)

XPath: itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/ansi-nist:MinutiaeFingerPositionCode

Example:

<ansi-nist:MinutiaeFingerPositionCode>5</ansi-nist:MinutiaeFingerPositionCode>

9.015 (NMN)

XPath: itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/fbiebtsitl:MinutiaeFBIStandard/ansi-nist:MinutiaeQuantity

Example:

<ansi-nist:MinutiaeQuantity>2</ansi-nist:MinutiaeQuantity>

9.016 (FCP)

XPath:
itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/fbiebtsitl:MinutiaeFBIStandard/fbiebtsitl:FingerprintCharacterizationProcess

Example:

```
<fbiebtsitl:FingerprintCharacterizationProcess>
    <!--VEN 9.016A-->

<fbiebtsitl:CharacterizationSoftwareVendorName>AFISFBI</fbiebtsitl:CharacterizationSoftwareVendorName>
    <!--VID 9.016B-->
    <fbiebtsitl:CharacterizationVersionValue>R2</fbiebtsitl:CharacterizationVersionValue>
    <!--MET 9.016C-->

<fbiebtsitl:CharacterizationClassificationAutomationDegreeCode>C</fbiebtsitl:CharacterizationClassificationAutomationDegreeCode>

<fbiebtsitl:CharacterizationMinutiaeAutomationDegreeCode>A</fbiebtsitl:CharacterizationMinutiaeAutomationDegreeCode>

<fbiebtsitl:CharacterizationRidgeCountAutomationDegreeCode>V</fbiebtsitl:CharacterizationRidgeCountAutomationDegreeCode>
</fbiebtsitl:FingerprintCharacterizationProcess>
```

9.017 (APC)

XPath: itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/fbiebtsitl:MinutiaeFingerPatternDetail

Example:

```
<fbiebtsitl:MinutiaeFingerPatternDetail>
    <itl:FingerPatternCodeSourceCode>U</itl:FingerPatternCodeSourceCode>
    <!--APAT 9.017A-->
    <ansi-nist:FingerPatternCode>AU</ansi-nist:FingerPatternCode>
    <!--RCN1 9.017B-->
    <fbiebtsitl:MinutiaeRidgeCountValue>0</fbiebtsitl:MinutiaeRidgeCountValue>
    <!--RCN2 9.017C-->
    <fbiebtsitl:MinutiaeRidgeCountValue>0</fbiebtsitl:MinutiaeRidgeCountValue>
</fbiebtsitl:MinutiaeFingerPatternDetail>
```

9.018 (ROV)

XPath: itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/fbiebtsitl:CharacterizationRegionPolygon

Example:

```
<fbiebtsitl:CharacterizationRegionPolygon>
    <!-- XYM 9.018A -->
    <itl:PositionPolygonVertex>
        <ansi-nist:PositionHorizontalCoordinateValue>1016</ansi-
nist:PositionHorizontalCoordinateValue>
        <ansi-nist:PositionVerticalCoordinateValue>508</ansi-nist:PositionVerticalCoordinateValue>
    </itl:PositionPolygonVertex>
    <!-- XYM 9.018A -->
    <itl:PositionPolygonVertex>
        <ansi-nist:PositionHorizontalCoordinateValue>2413</ansi-
nist:PositionHorizontalCoordinateValue>
        <ansi-nist:PositionVerticalCoordinateValue>1016</ansi-nist:PositionVerticalCoordinateValue>
    </itl:PositionPolygonVertex>
    <!-- XYM 9.018A -->
    <itl:PositionPolygonVertex>
        <ansi-nist:PositionHorizontalCoordinateValue>2032</ansi-
nist:PositionHorizontalCoordinateValue>
        <ansi-nist:PositionVerticalCoordinateValue>1016</ansi-nist:PositionVerticalCoordinateValue>
    </itl:PositionPolygonVertex>
</fbiebtsitl:CharacterizationRegionPolygon>
```

9.019 (COF)

XPath: itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/fbiebtsitl:CoordinateOffsets

Example:

```
<fbiebtsitl:CoordinateOffsets>
    <!--XYP 9.019A-->
    <fbiebtsitl:UpperLeftCornerOffsetPosition>
        <fbiebtsitl:OffsetHorizontalCoordinateValue>123</fbiebtsitl:OffsetHorizontalCoordinateValue>
        <fbiebtsitl:OffsetVerticalCoordinateValue>444</fbiebtsitl:OffsetVerticalCoordinateValue>
    </fbiebtsitl:UpperLeftCornerOffsetPosition>
    <!--XYP 9.019B-->
    <fbiebtsitl:SubimageCenterOfRotationPosition>
        <fbiebtsitl:OffsetHorizontalCoordinateValue>465</fbiebtsitl:OffsetHorizontalCoordinateValue>
        <fbiebtsitl:OffsetVerticalCoordinateValue>433</fbiebtsitl:OffsetVerticalCoordinateValue>
    </fbiebtsitl:SubimageCenterOfRotationPosition>
    <!--THET 9.019C-->
    <fbiebtsitl:RotationThetaAngleMeasure>12</fbiebtsitl:RotationThetaAngleMeasure>
    <!--XYP 9.019D-->
    <fbiebtsitl:RotatedSubimageCenterOfRotationPosition>
        <fbiebtsitl:OffsetHorizontalCoordinateValue>465</fbiebtsitl:OffsetHorizontalCoordinateValue>
        <fbiebtsitl:OffsetVerticalCoordinateValue>433</fbiebtsitl:OffsetVerticalCoordinateValue>
    </fbiebtsitl:RotatedSubimageCenterOfRotationPosition>
    <!--XYP 9.019E-->
    <fbiebtsitl:RotatedUpperLeftCornerOffsetPosition>
        <fbiebtsitl:OffsetHorizontalCoordinateValue>123</fbiebtsitl:OffsetHorizontalCoordinateValue>
        <fbiebtsitl:OffsetVerticalCoordinateValue>444</fbiebtsitl:OffsetVerticalCoordinateValue>
    </fbiebtsitl:RotatedUpperLeftCornerOffsetPosition>
</fbiebtsitl:CoordinateOffsets>
```

9.020 (ORN)

XPath: itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/fbiebtsitl:OrientationUncertaintyValue

Example:

```
<fbiebtsitl:OrientationUncertaintyValue>210</fbiebtsitl:OrientationUncertaintyValue>
```

9.021 (CRA)

XPath: itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/fbiebtsitl:MinutiaeFingerCoreAttribute

Example:

```
<fbiebtsitl:MinutiaeFingerCoreAttribute>
    <!--XYM 9.021A-->
    <ansi-nist:PositionHorizontalCoordinateValue>0087</ansi-nist:PositionHorizontalCoordinateValue>
    <!--XYM 9.021A-->
    <ansi-nist:PositionVerticalCoordinateValue>0087</ansi-nist:PositionVerticalCoordinateValue>
    <!--DID 9.021B-->
```

```
    <ansi-nist:PositionDirectionDegreeValue>265</ansi-nist:PositionDirectionDegreeValue>
    <!--PUM 9.012C-->
    <ansi-nist:PositionUncertaintyValue>0175</ansi-nist:PositionUncertaintyValue>
</fbiebtsitl:MinutiaeFingerCoreAttribute>
```

9.022 (DLA)

XPath: itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/fbiebtsitl:MinutiaeFingerDeltaAttribute

Example:

```
<fbiebtsitl:MinutiaeFingerDeltaAttribute>
    <!--XYM 9.022A-->
    <ansi-nist:PositionHorizontalCoordinateValue>0087</ansi-nist:PositionHorizontalCoordinateValue>
    <!--XYM 9.021A-->
    <ansi-nist:PositionVerticalCoordinateValue>0087</ansi-nist:PositionVerticalCoordinateValue>
    <!--DID 9.022B-->

<fbiebtsitl:PositionUpwardDirectionDegreeValue>1948</fbiebtsitl:PositionUpwardDirectionDegreeValu
e>
    <!--DID 9.022C-->
    <fbiebtsitl:PositionLeftDirectionDegreeValue>0023</fbiebtsitl:PositionLeftDirectionDegreeValue>
    <!--DID 9.022D-->
    <fbiebtsitl:PositionRightDirectionDegreeValue>078</fbiebtsitl:PositionRightDirectionDegreeValue>
    <!--PUM 9.022E-->
    <ansi-nist:PositionUncertaintyValue>210</ansi-nist:PositionUncertaintyValue>
</fbiebtsitl:MinutiaeFingerDeltaAttribute>
```

9.023 (MAT)

XPath:
itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/fbiebtsitl:MinutiaeFBIStandard/fbiebtsitl:Minutia
Detail

Example:

```
<fbiebtsitl:MinutiaDetail>
    <!-- XYT 9.023B -->
    <ansi-nist:PositionHorizontalCoordinateValue>0486</ansi-nist:PositionHorizontalCoordinateValue>
    <!-- XYT 9.023B -->
    <ansi-nist:PositionVerticalCoordinateValue>2839</ansi-nist:PositionVerticalCoordinateValue>
    <!--MDX 9.023A-->
    <ansi-nist:MinutiaIdentification>
        <nc:IdentificationID>2</nc:IdentificationID>
    </ansi-nist:MinutiaIdentification>
```

```
    <!--XYT 9.023B-->
    <ansi-nist:PositionThetaAngleMeasure>048</ansi-nist:PositionThetaAngleMeasure>
    <!--QMS 9.023C-->
    <ansi-nist:MinutiaQualityValue>1</ansi-nist:MinutiaQualityValue>
    <!--MTD 9.023D-->
    <ansi-nist:MinutiaCategoryCode>B</ansi-nist:MinutiaCategoryCode>
    <!--MRO 9.023E-L-->
    <ansi-nist:MinutiaRidgeCount>
        <ansi-nist:RidgeCountReferenceIdentification>
            <nc:IdentificationID>1</nc:IdentificationID>
        </ansi-nist:RidgeCountReferenceIdentification>
        <ansi-nist:RidgeCountValue>6</ansi-nist:RidgeCountValue>
    </ansi-nist:MinutiaRidgeCount>
    <ansi-nist:MinutiaRidgeCount>
        <ansi-nist:RidgeCountReferenceIdentification>
            <nc:IdentificationID>2</nc:IdentificationID>
        </ansi-nist:RidgeCountReferenceIdentification>
        <ansi-nist:RidgeCountValue>3</ansi-nist:RidgeCountValue>
    </ansi-nist:MinutiaRidgeCount>
    <!--RSO 9.023N-->
    <fbiebtsitl:MinutiaOctantResidualValue>0</fbiebtsitl:MinutiaOctantResidualValue>
</fbiebtsitl:MinutiaDetail>
```

9.024 (CHQ)

XPath:
itl:PackageMinutiaeRecord/fbiebtsitl:Minutiae/fbiebtsitl:MinutiaCharacterizationQualityValue

Example:

```
<fbiebtsitl:MinutiaCharacterizationQualityValue>50</fbiebtsitl:MinutiaCharacterizationQualityValue>
```

9.025 (CLQ)

XPath: fbiebtsitl:MinutiaClassifierQualityValue

Example:

```
<fbiebtsitl:MinutiaClassifierQualityValue>22</fbiebtsitl:MinutiaClassifierQualityValue>
```