



Intelligence Community Technical Specification

XML Data Encoding Specification for Intelligence Publications

Version 2018-APRr2022-MAY

December 1, 2022

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Chapter 1 - Introduction

1.1 - Purpose

This *XML Data Encoding Specification for Intelligence Publications* (PUBS.XML) defines detailed implementation guidance for using Extensible Markup Language (XML) to encode publications data. This Data Encoding Specification (DES) defines the XML elements and attributes, associated structures and relationships, mandatory and cardinality requirements, and permissible values for representing publications data concepts using XML. This DES also defines how to properly structure a valid instance of *XML Data Encoding Specification for Trusted Data Format* (IC-TDF.XML^[10]) that would conform with this specification. Use of Trusted Data Format (TDF) is required for compliance with this DES. A TDF may conform with multiple DES simultaneously assuming none of the criterion are in conflict.

1.2 - Scope

The *Intelligence Community Technical Specification Framework* (IC-SF.XML^[9]) defines the basic conceptual structure and outlines the core philosophy of Intelligence Community (IC) technical specifications. For convenience, a copy of this framework is included in every package.

This specification is applicable to the IC and information produced by, stored, or shared within the IC. This DES may have relevance outside the scope of intelligence; however, prior to applying outside of this defined scope, the DES should be closely scrutinized and differences separately documented and assessed for applicability.

1.3 - Enterprise Need

This DES is designed to fulfill a number of requirements in support of the transformational efforts of the IC. These requirements include:

- Improving publication and dissemination efficiency by reducing the cost and time for performing manual and complex rendering, manipulation, and content transformation of information resource metadata in context of an intelligence publication.
- Facilitating discovery and exchange of content consisting of mostly text supplemented by interspersed non-textual content (i.e., multi-media) information between collectors, all-source analysts, and consumers.
- Capturing an intelligence publication's overall security marking metadata in order to support attribute and clearance-based information management practices, such as secure collaboration, content management, content and portion-level filtering of discovery results, and content transfers across security domains.
- Capturing source reference citations to provide intelligence collectors the ability to systematically analyze how and how often the data they gather or produce is being used in order to facilitate better management of collection and production resources.
- Capturing source reference citations to enhance the analytic integrity of formally disseminated intelligence information and improving the traceability of collected information to analytic judgments and conclusions.

- Capturing and retaining a greater understanding of an intelligence publication's meaning, purpose, genesis, and characteristics as identified by a human or service.

Both enterprise needs and requirements for this specification can be found in the following policies and implementation guidance:

- 200 Series:
 - Intelligence Community Directive (ICD) 206, *Sourcing Requirements for Disseminated Analytic Products* [\[11\]](#)
 - ICD 208, *Write for Maximum Utility* [\[12\]](#)
 - ICD 209, *Tearline Production and Dissemination* [\[13\]](#)
 - Intelligence Community Policy Memorandum (ICPM) 2007-200-2, *Preparing Intelligence to Meet the Intelligence Community's Responsibility to Provide* [\[17\]](#)
- 500 Series:
 - ICD 500, *Director Of National Intelligence Chief Information Officer* [\[14\]](#)
 - ICD 501, *Discovery and Dissemination or Retrieval of Information within the IC* [\[15\]](#)
 - Intelligence Community Standard (ICS) 500-20, *IC Enterprise Standards Compliance* [\[18\]](#)
 - ICS 500-21, *Tagging of Intelligence and Intelligence-Related Information* [\[19\]](#)

1.4 - Conventions

Certain technical and presentation conventions are used in the creation of the IC technical specifications to ensure readability and understanding. For details, please see the "Specification Conventions" chapter in the IC-SF.XML [\[9\]](#).

1.4.1 - XML Namespaces

Namespaces referenced in this document and the prefixes used to represent them are listed in the following table. The namespace prefix of any XML Qualified Name used in any example in this document should be interpreted using the information below.

Table 1 - XML Namespaces

Prefix	URI
irm	urn:us:gov:ic:irm
ism	urn:us:gov:ic:ism
pubs	urn:us:gov:ic:pubs
rr	urn:us:gov:ic:revrecall
src	urn:us:gov:ic:src
cem	urn:us:gov:ic:cem
tdf	urn:us:gov:ic:tdf
xsd	http://www.w3.org/2001/XMLSchema

1.5 - Dependencies

Specifications often rely on other specifications, components or artifacts, either directly or indirectly. For specific definitions of dependency terminology used throughout this section, please see the “Dependency Definitions” chapter in the IC-SF.XML^[9].

1.5.1 - Specification Dependencies

This technical specification directly depends on the technical specifications, documentation, and implementations listed in [Table 2](#). The dependencies listed below are directly referenced in this specification (e.g., Schema, Schematron), and are normative or informative as indicated.

The subsequent figure, [Figure 1](#), is an informative graphical representation of all of the Intelligence Community Chief Information Officer (IC CIO) specifications related to this specification. The graphic depicts dependencies. However, the representations may not match an exact schema import tree or dependency diagram that an analysis of the Schema, Schematron or other documents would yield. For example, the graphic only shows a given specification once even though it may actually be imported by many specifications or be a direct dependency. All IC CIO specifications listed in [Table 2](#) will be shown in [Figure 1](#); however not all IC CIO specifications listed in [Figure 1](#) may appear in [Table 2](#). [Figure 1](#) is to aid users in gaining a general understanding of all dependencies whether direct or transitive.

In the related specifications figure, [Figure 1](#), SOME-TDF is not an actual specification but a placeholder in the diagram that represents the fact that this specification depends on some TDF specification in its usage as an assertion in a Trusted Data Object (TDO).

Table 2 - Direct Dependencies

Name	Dependency Description
<i>XML Data Encoding Specification for Trusted Data Format (IC-TDF.XML.V2019-MAR+)</i> ^[10]	PUBS.XML elements, as well as its dependent specifications, are used in conjunction with IC-TDF.XML ^[10] objects as structured assertions or content that compose the necessary material represented by PUBS.XML. The dependence of PUBS.XML on IC-TDF.XML ^[10] is normative. This specification does not depend on a specific version of IC-TDF.XML ^[10] ; versions later than version 2019-MAR MAY be used. The minimum version was based on the earliest non-retired version; Enterprise Standards Baseline (ESB) 22-1 was used for determining the version.
<i>XML Data Encoding Specification for Contextual Entity Markup (CEM.XML.V2018-APR+)</i> ^[3]	This specification does not depend on a specific version of CEM.XML ^[3] ; versions later than version 2018-APR MAY be used. The minimum version was based on the earliest non-retired version; ESB 22-1 was used for determining the version.

Name	Dependency Description
<i>XML Data Encoding Specification for Information Resource Metadata</i> (IRM.XML.V2021-NOV+) ^[21]	This specification does not depend on a specific version of IRM.XML ^[21] ; versions later than version 2021-NOV MAY be used. The minimum version was based technical dependencies; IRM updating to use USAgency updates for consistency of format for foreign partner organizations and IRM removal of specific IC-TDF environment check due to their being other TDF specifications.
<i>XML Data Encoding Specification for Source Citations</i> (SRC.XML.V2015-AUGr2022-MAY+) ^[35]	This specification does not depend on a specific version of SRC.XML ^[35] ; versions later than version 2015-AUGr2022-MAY MAY be used. The minimum version was based on technical dependencies; SRC fix to prevent duplicate citations.
<i>CVE Encoding Specification for Intelligence Discipline</i> (INTDIS.CES.V2017-JUL+) ^[20]	The specification does not depend on a specific version of INTDIS.CES ^[20] ; versions later than version 2017-JUL MAY be used. The minimum version was based on the earliest non-retired version; ESB 22-1 was used for determining the version.
<i>XML Data Encoding Specification for Information Security Marking Metadata</i> (ISM.XML.V2021-NOVr2022-NOV+) ^[22]	This specification depends on the LATEST technically sound, approved version of ISM.XML ^[22] . The minimum version was based on compliance with the authoritative source, which is ICD-710 ^[16] . Per ICD-710, all security markings MUST be updated within 365 days of a release of the Register and Manual. As of this release, the latest version of ISM.XML is 2021-NOVr2022-NOV which is based on the Register and Manual released in August, 2019.
<i>CVE Encoding Specification for Media Type</i> (MIME.CES.V2020-OCT+) ^[30]	This specification does not depend on a specific version of MIME.CES ^[30] ; versions later than version 2020-OCT MAY be used. The minimum version was based on the earliest non-retired version; ESB 22-1 was used for determining the version.
<i>XML Data Encoding Specification for Enterprise Data Header</i> (IC-EDH XML.V2019-MAR+) ^[8]	This specification does not depend on a specific version of IC-EDH.XML ^[8] ; versions later than version 2019-MAR MAY be used. The dependence of PUBS.XML on IC-EDH.XML is normative. The minimum version was based on the earliest non-retired version; ESB 22-1 was used for determining the version.

Name	Dependency Description
<i>XML Data Encoding Specification for Virtual Coverage</i> (VIRT.XML.V2020-OCT+ ^[36])	This specification does not depend on a specific version of VIRT.XML ^[36] ; versions later than version 2020-OCT MAY be used. The minimum version was based on the earliest non-retired version; ESB 22-1 was used for determining the version.
<i>Intelligence Community Specification Framework</i> (IC-SF.XML.V2021-NOV+ ^[9])	This specification does not depend on a specific version of IC-SF.XML ^[9] ; versions later than version 2021-NOV MAY be used, however, the newest version of IC-SF.XML SHOULD be used as IC-SF.XML is expected to always replace its preceding version. The minimum version was based on technical dependencies on IC-SF.XML; IC-SF.XML is the basic structure of and philosophy behind intelligence community technical specifications.
International Organization for Standardization (ISO) 639-1 ^[23] : Codes for the representation of names of languages – Part 1: Alpha-2 code.	Depends on ISO 639-1. This dependency is normative.
ISO 639-2 ^[24] : Codes for the representation of names of languages – Part 1: Alpha-3 code.	Depends on ISO 639-2. This dependency is normative.
ISO 639-3 ^[25] : Codes for the representation of names of languages – Part 3: Alpha-3 code for comprehensive coverage of languages.	Depends on ISO 639-3. This dependency is normative.
ISO 4217 ^[27] : Codes for the representation of currencies and funds.	Depends on ISO 4217. This dependency is normative.

Name	Dependency Description
Schematron ^[34]	<p>Schematron — ISO/International Electrotechnical Commission (IEC) 19757-3:2006 — is a rule-based document schema definition language. In this specification Schematron is a formal language used to express normative business rules, so this reference is normative.</p> <p>The Schematron rules are normative in the sense that they convey criteria that a document MUST adhere to, exactly as English may be used to convey normative criteria. It is not necessary for implementers to use the specific Schematron encoding in this specification. Implementers MAY use any encodings, tools, or languages desired to implement validation schemes for conformance to this specification.</p> <p>Note: The Schematron rules in this specification use Transformations (XSLT) 2.0^[38] query binding.</p>
<p>XSLT 2.0^[38] implementation of Schematron^[34] by Rick Jelliffe (2010-04-14)</p> <p>Note: The only available identifying descriptors for this implementation are the implementer's name and date of release. This implementation may be found at the following Uniform Resource Locator (URL): http://code.google.com/p/schematron/.</p>	<p>The International Organization for Standardization does not create nor endorse reference implementations of its standards. For the purposes of this specification the <i>behavior</i> of the implementation created by Mr. Jelliffe is normative.</p> <p>Implementers MAY use any encodings, tools, or languages desired to implement validation schemes for conformance to this specification. To conform to this specification, a validator MUST find a document valid <i>if and only if</i> the Schematron implementation by Mr. Jelliffe would find the document valid according to the Schematron rules in this specification.</p>

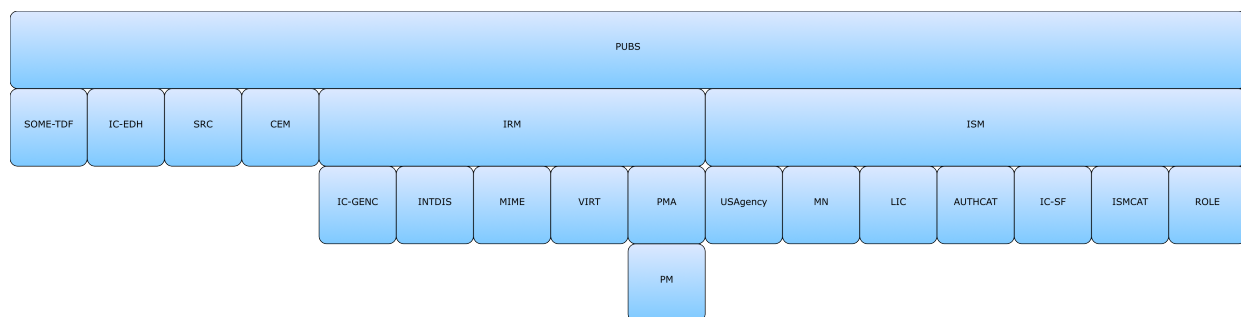


Figure 1 : Related Specifications

1.5.2 - Inverse Dependencies

Generally, it is only necessary to think of the *dependencies* in the dependency tree. However, with the specification versions being decoupled, it is also important to consider the *inverse dependencies*, for compatibility with newer versions of a given specification. The changes introduced to a given specification can sometimes make it incompatible with current versions of its inverse dependencies (specifications that uses the given specification).

This specification is not used by other specifications released by the IC CIO, and therefore does not contain an Inverse Dependency Diagram.

Chapter 2 - Development Guidance

For information on the structure and content of the specifications, please see the “Specification Overview” chapter in the IC-SF.XML^[9] framework document. This chapter is intended to expand upon the common information that the framework specifies providing specific development guidance that is specific to the implementation of this specification.

2.1 - Relationship to Abstract Data Definition and other encodings

The relationship of the XML structures defined in this encoding specification to the abstract terms defined in the Abstract Data Definition (ADD) are described using a mapping table in the ADD. The mapping tables generally show the mapping to the encoding specification where a structure is defined, not where it is used. These mappings are provided for reference only. The complete set of encoding specification artifacts, both normative and informative, should be consulted in order to gain a complete understanding of this encoding specification.

The mappings in the ADD provide a starting point for the development of automated transformations between formats defined by the encoding specifications. However, it should be noted that when these transformations are used between formats with different levels of detail there might be some data loss.

2.2 - Additional guidance

This section provides additional guidance for encoding data in specific situations. In particular, situations for which there is not clearly a single method of encoding the data are documented here. The content of this section will evolve over time as additional situations are identified. Implementers of this DES are encouraged to contact the maintainers of this DES for further guidance when necessary.

2.2.1 - Publications Metadata Usage

PUBS.XML is used in conjunction with IC-TDF.XML^[10] objects as structured assertions and content. A TDO conforms to the PUBS.XML specification when it contains all of the following:

- Structured content with an IntelDoc element
- An assertion of scope Payload (PAYL) with a structured statement containing an *XML Data Encoding Specification for Information Resource Metadata* (IRM.XML)^[21] **ICResourceMetadataPackage** element
- An assertion of scope PAYL with a structured statement containing an **IntelDocMetadata** element

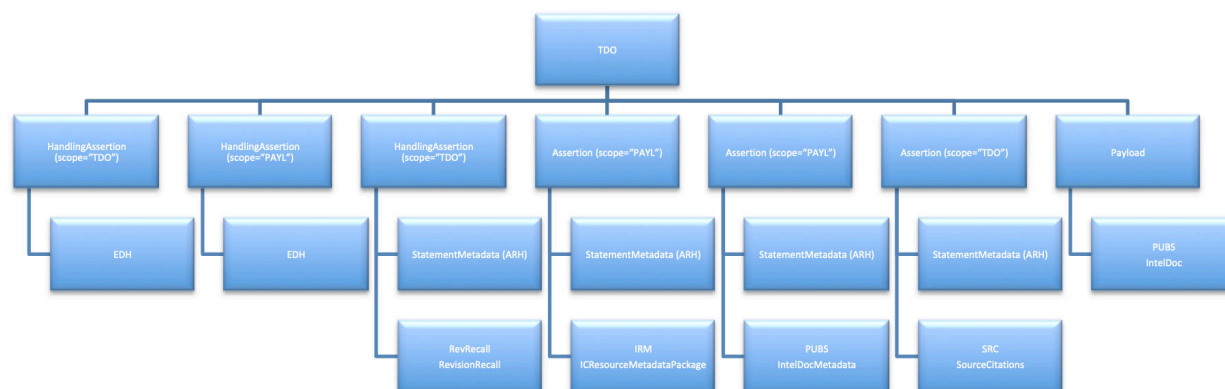


Figure 2 : Diagram of PUBS Structure

2.2.2 - Use of IC Resource Metadata Package

PUBS.XML uses the IRM.XML^[21] element **irm:ICResourceMetadataPackage** element to capture the bulk of the “library-card” metadata for the publication.

irm:ICResourceMetadataPackage is included as a peer assertion in the TDO and also include several elements nearly identical in name and definition, though not structure, to those defined in IRM.XML^[21]. These elements, such as **pubs:Title**, **pubs:Description**, etc. are duplicated in PUBS.XML to allow for the capture of a “rich-text-like” presentation of the data. Unless guidance is provided by the author of the data to the contrary, when duplicate elements appear in an instance document the elements in **irm:ICResourceMetadataPackage** should be used for “metadata-like” functions such as indexing, metrics, etc. and the elements in **pubs:PublicationMetadata** should be used for display purposes. In both cases this should not have the effect of one set of elements overriding another.

2.2.3 - Specification of publishing organization

See the IRM.XML^[21] specification for details.

2.2.4 - Specification of Need-To-Know Access Parameters

The element **ntk:Access** is used to identify the parameters needed by a system to allow that system to automatically process an access request involving determination of Need-To-Know. See the *XML Data Encoding Specification for Information Security Markings* (ISM.XML^[22]) specification for details.

2.2.5 - Specification of Production Metrics Reporting Metadata

Production Metrics Reporting Metadata is used to support reporting of production metrics as required by Office of the Director of National Intelligence (ODNI) Deputy Director, Mission Integration. This metadata consists of tripled values of actor, subject, and location. See the IRM.XML^[21] specification for details.

2.2.6 - Specification of IntelDocMetadata

The element **pubs:IntelDocMetadata** is placed in the **tdf:StructuredStatement** of an assertion in a TDO. There must be at least one assertion of this type but there may be more than one. This is where the **@pubs:DESVersion** is specified. If there are multiple assertions of this type, then they all must have the same value for **pubs:DESVersion**.

2.2.7 - Specification of PublicationMetadata

The element **pubs:PublicationMetadata** is placed in the **pubs:IntelDoc** element. There must be at least one **pubs:PublicationMetadata** element; however, there may be more than one. For example, there may be multiple **pubs:PublicationMetadata** elements of differing classifications, supporting tearline operations the same way as there may be multiple IRM.XML^[21] assertions of differing classifications. One of the **pubs:PublicationMetadata** classifications could be "TOP SECRET" while another could be "SECRET". An example document "RogersRangersMultiMeta.xml" is provided in the Examples directory. The document is UNCLASSIFIED but has example For Official Use Only (FOUO) markings to show having multiple **pubs:PublicationMetadata**. Ensure compliance with "PUBS-ID-00086"; it requires classification of the individual **pubs:PublicationMetadata** elements when you have multiple **pubs:PublicationMetadata** elements.

2.2.8 - Specification of Notes and Security Notices

The elements **Note** and **NoteInline** are used to specify a comment or explanation of the data in nearby elements or text. Both elements are allowed in the body of the document and can be used to provide a notice near the location of the data requiring the notice.

The **pubs:NoteList** element is allowed as a child of the **pubs:IntelDocMetadata** element to specify **pubs:Note** sub-elements that pertain to an entire document. The **@noteType** attribute is used to further indicate the reason for the inclusion of the notice and/or the category to which the notice belongs.

To represent security-related notices, **ISMNoticeAttributesGroup** can be included on a **pubs:Note** element to indicate either a type of ISM.XML^[22] recognized security notice, using **@ism:noticeType**, or an unregistered security-related notice, using **@ism:unregisteredNoticeType**. These attributes are analogous to the **noteType** attribute, which is used to categorize a non-security-related notice. For additional information concerning security-related notices, see the ISM.XML^[22] specification.

See the example file, "SourceCitations.xml", for a sample notice and use of the above structures for both security-related and non-security-related notices.

2.2.8.1 - Point Of Contact Requirements

For documents containing certain types of data, or claiming compliance with specific directives, a point-of-contact to whom questions about the document can be directed, is required. The **pubs:NoteList/pub:Note** element can be used to fulfill these requirements by using the **@ism:noticeType** value of "POC" to indicate that the contents of a **pubs:Note** are used to provide contact information for security-related notices. The **ism:POCAttributeGroup's**

@ism:pocType attribute indicates that the text of the **pubs:Note** element specifies the IC element point-of-contact and contact instructions to expedite decisions on information sharing, while specifying which type(s) of information that contact should handle.

Example:

```
<Note
  ism:classification="U"
  ism:ownerProducer="USA"
  ism:noticeType="POC"
  ism:pocType="ICD-710 DoD-Dist-C">

  <Para>John Smith, AgencyX, 888-555-5555, jsmith@agencyx.gov</Para>

</Note>
```

The attributes in the **ism:POCAttributeGroup** element are also allowed on the entity information elements **pubs:AuthorInfo**, **pubs:CoauthorInfo**, **pubs:POCInfo**, and **pubs:ContributingAuthorInfo**. For further granularity, these elements may use the @ism:pocType attribute to indicate that its element structures contain the contact information for a point-of-contact requirement.

Example:

```
<AuthorInfo ism:pocType="DoD-Dist-F">
  <Surname>Smith</Surname>
  <GivenName>John</GivenName>
  <PhoneNumber>888-555-5555</PhoneNumber>
  <Affiliation>AgencyX</Affiliation>
  <EmailAddress>jsmith@agencyx.gov</EmailAddress>
</AuthorInfo>
```

2.2.9 - Specification of Approximable dates

Some dates used, including **irm:acquiredOn** and temporal coverage date ranges, use a construct to support approximate dates and date ranges. Approximable dates can be expressed in any of three encodings: a free-text date string, a single ISO 8601, *Data elements and Interchange Formats – Information interchange – Representation of dates and times* ^[28] date, or a pair of dates encoded as **xsd:dateTime** values. The three encodings allow for different degrees of precision in the date value and varying processing expectations.

2.2.9.1 - Date String

A date string has no vocabulary associated with it and few, if any, constraints. A date string may be broad or precise, but there is no expectation that systems process date strings as proper dates or date ranges, and there is no expectation that systems use date strings in temporal searches; search engines may index the string for text searches. Examples of date strings include “sometime last week”, “Ramadan 2010”, and “Tuesday”.

2.2.9.2 - Single ISO 8601 Format Date

A single ISO 8601^[28] format date may be used with or without the optional **@approximation** attribute. ISO 8601^[28] format dates support levels of specificity and the **@approximation** attribute modifies the date with values such as early, late, or circa. For example, an ISO 8601^[28] format date could express any of the following:

- 2010
- Early 2010
- Circa 2010-01
- 2010-01-01
- 2010-01-01T12
- 2010-01-01T12:30

The parsing of an ISO 8601^[28] format date is well defined; however, search and discovery behavior is still ambiguous. That is, the specific criteria for returning a record marked with a partial date or a date with an **@approximation** attribute is up to each search engine to decide. For example, some IC systems interpret the partial date 2010 as 2010-01-01T00:00:00.0Z exactly, while other systems interpret the same value (2010) as matching all dates and times in 2010.

2.2.9.3 - Date Pair

A pair of **xsd:dateTime** dates may be used to encode a date range: one representing the start of the range and the other the end of the range. Using a date range for an approximate date simplifies searching and provides a clear processing expectation. Since each value in the pair is an **xsd:dateTime**, partial dates are not supported. All systems processing dates encoded in this manner should execute queries using a formula equivalent to:

EarliestDate <= QueryValue < **LatestDate**

For example, encoding "2010" using an **EarliestDate** of "2010-01-01T00:00:00Z" and a **LatestDate** of "2011-01-01T00:00:00Z" clearly indicates that the date "2010" represents any date-time in 2010. Using the starting/earliest and ending/latest date encodings of a date provides the most clarity and gives the producer of the data the greatest control of exactly how that data should be handled by a system.

If a data producer wants to specify the preferred interpretation for either string or approximate ISO 8601^[28] encoded dates, they should also specify the "earliest/latest" values which best encode their intention. It is expected that systems will use date pairs when present for any date-based discovery or retrieval; string and approximate ISO 8601^[28] dates may be used for display.

2.2.10 - Approximate Dates in Constraint Rules

- When only a string is specified, the constraint rules will assume that the date passes any constraints involving it.

- When an ISO 8601^[28] date is specified with varying amounts of precision, the constraint rules will determine if the valid date is a subset of the date specified. For example, 2010 is before 2010-10; since 2010 encompasses all dates in 2010, the valid dates prior to October 2010 are included in that set and the rule would pass. Similarly, 2010 is also after 2010-10 since it encompasses all the dates after October. However, 2010-10 is not before 2010-05 because none of the dates encompassed by 2010-10 occurred prior to 2010-05.
- When earliest/latest values are specified, the rules should still determine if any of the range would satisfy and, if so, the rule passes.
- When more than one encoding is specified, the most restrictive will be used.
 - Use ISO over String
 - Use earliest/latest over ISO

2.2.11 - MIME Type

The Media Type (MIME) type for a PUBS.XML document is application/dni-pubs+xml. This is a convention for our community. This type has NOT been registered with the Internet Assigned Numbers Authority (IANA). Should there be a conflict in the future, it will be addressed at that time. Systems can use this MIME type to facilitate communications and address business needs within the community.

2.2.12 - Specification of Source Citations

Source citations for covered analytic products leverage *XML Data Encoding Specification for Source Citations* (SRC.XML^[35]). The container for citations, **pubs:SourceGroup**, has elements, **pubs:SourceReferenceCitationRef** and **pubs:AppendedReferenceCitationRef**, that point to SRC.XML's^[35] **src:SourceReferenceCitation** and **src:AppendedReferenceCitation**, respectively. The source reference citations and appended reference citations live within the SRC.XML's^[35] root element, **src:SourceCitations**, which lives as an IC-TDF.XML^[10] assertion.

The source references for a related resource, **pubs:Relation**, do not leverage SRC.XML^[35] and use the **pubs:SourceReference** element instead.

Chapter 3 - Constraints

3.1 - Data Validation Constraint Rules

The PUBS.XML schema defines the data elements, attributes, cardinalities and parent-child relationships for which XML instances must comply. Validation of these syntax aspects is an important first step in the validation process. An additional level of validation is needed to ensure that the content complies with the constraints as specified in applicable IC policy guidance and codified in these constraint rules. Traditional schema languages are generally unable to effectively represent these additional constraints. For more information, please see the Data Validation Constraint Rules chapter in the IC-SF.XML^[9] framework document.

3.1.1 - Inherited Constraints

In an instance of PUBS.XML, the use of attributes and elements from supplementary data encoding specifications must be fully conformant with the constraint rules defined in those specifications. For a full list of supplementary specifications, see [Section 1.5 - Dependencies](#).

3.1.2 - Value Enumeration Constraints

Several elements and attributes of the PUBS.XML model use Controlled Vocabulary Enumeration (CVEs) to define the data allowed in the element or attribute. In some cases the specific CVE is specified via an attribute, which may include a default CVE. Further, in some of the cases where the CVE can be specified, the attribute may restrict the list of CVEs allowed and some may allow for the author to specify their own CVE. For each of these, the value must be in the specified external CVE or the default CVE.

Some CVEs are not available on all networks. A subset CVE will be provided for use on networks not approved for the entire list. If the processing will occur on a network where the entire CVE is not available, the subset CVE may be substituted in the constraint rules since the excluded values would be excluded from use on the lower network.

As noted in the specific rules, a failure of validation against a CVE will generate an Error.

3.1.3 - Additional Constraints

3.1.3.1 - DES Constraints

The DES version is specified through attributes on the root element. The schema constrains the values of these attributes. The **DESVersion** attribute enables systems processing an instance document to be certain which set of constraint rules, schema, CVEs and business rules are intended by the author to be used.

3.1.4 - Constraint Rules

The detailed constraint rules for the PUBS.XML schema can be found in a separate document inside the Documents/PUBS directory, in the "PUBS_Rules.pdf" file. This document is generated from the individual Schematron files to provide a single searchable document for all of the

constraint rules encoded in Schematron. Obsolete rule numbers are listed in the “PUBS_Rules.pdf” file.

3.1.5 - Dates and Times

Except for attribute `@date` for which the data type is `xsd:date`, the data type of each PUBS.XML date/time-related element and attribute is specified as one of four custom simple types defined to allow the full range of allowable patterns specified in the DES for that element or attribute. These four custom simple types are in fact unions of appropriate World Wide Web Consortium (W3C) primitive data types, three of which also include in the union one of two additional custom simple types defined to allow seconds to be optional in time specifications. Schema validation will automatically ensure conformity to the data types. Validations and time comparisons will use the Zulu (Z) time zone when a time zone indicator is absent.

The following table summarizes the data types and allowable layout of representations for each of the PUBS.XML date/time-related elements and attributes.

Table 3 - Date/Time-Related Data Types and Layout Representations

Element or Attribute	Data Type	Layout of Representation
DateApproved (irm:dates/ @@irm:approvedOn) DateInfoCutoff (irm:temporalCoverage [irm:name="infoCutOff "]/ irm:approximableEnd/ irm:searchableDate/ irm:end) DateReceived (irm:dates/ @@irm:receivedOn) DatePosted (irm:dates/ @@irm:posted) DateValidTil (irm:dates/ @@irm:validTil) pubs:DatePublished pubs:DateReviewed pubs:DateRevised pubs:DateTimeReferen ced @@cem:normalizedDate Time	irm:CombinedDateType, pubs:ISO8601DateTIme Type, cem:ISO8601DateTImeT ype	YYYY(Z ±hh:mm)? YYYY-MM(Z ±hh:mm)? YYYY-MM-DD(Z ±hh:mm)? YYYY-MM-DDThh:mm(Z ±hh:mm) YYYY-MM-DDThh:mm:ss(.s)?(Z ±hh:mm)
pubs:DateString	ism:ShortStringType	A string less than 256 characters such as "Independence day 1980"
pubs:DateInformation	pubs:Approximable- DateTime- StructureType	A structure consisting of one or more values including a pubs:DateString, pubs:ApproximableDateTime, ApproximableDateTimeStart, and ApproximableDateTimeEnd,

Element or Attribute	Data Type	Layout of Representation
pubs:Approximable-DateTime ApproximableDate-TimeStart (irm:temporalCoverage / irm:approximableStart/ irm:approximableDate) ApproximableDate-TimeEnd (irm:temporalCoverage /irm:approximableEnd/ irm:approximableDate) DateAcquired(irm:dates/@irm:acquiredOn)	pubs:Approximable-DateTimeType , complexType extending irm:CombinedDateType with @approximation	YYYY-MM-DDThh:mm:ss(.s)?(Z ±hh:mm)?with optional @approximation
pubs:EarliestStartDate pubs:LatestEndDate	pubs:dateTime	YYYY-MM-DDThh:mm:ss(.s)?(Z ±hh:mm)
@@date	xsd:date	YYYY-MM-DD(Z ±hh:mm)?
@@cem:dateTime	cem:dateTimeType	(YYYY(Z ±hh:mm)? YYYY-MM(Z ±hh:mm)? YYYY-MM-DD(Z ±hh:mm)? YYYY-MM-DDThh:mm(Z ±hh:mm) YYYY-MM-DDThh:mm:ss(.s)?(Z ±hh:mm))+
@@cem:normalizedDate	cem:ISO8601DateType	YYYY(Z ±hh:mm)? YYYY-MM(Z ±hh:mm)? YYYY-MM-DD(Z ±hh:mm)?
@@cem:normalizedTime	cem:ISO8601TimeType	hh:mm(Z ±hh:mm) hh:mm:ss(.s)?(Z ±hh:mm)

Element or Attribute	Data Type	Layout of Representation
@@cem:dateTimeRange	cem:dateTimePairsType	((YYYY(Z ±hh:mm)? YYYY-MM(Z ±hh:mm)? YYYY-MM-DD(Z ±hh:mm)? YYYY-MM-DDThh:mm(Z ±hh:mm) YYYY-MM-DDThh:mm:ss(.s)?(Z ±hh:mm)), (YYYY(Z ±hh:mm)? YYYY-MM(Z ±hh:mm)? YYYY-MM-DD(Z ±hh:mm)? YYYY-MM-DDThh:mm(Z ±hh:mm) YYYY-MM-DDThh:mm:ss(.s)?(Z ±hh:mm)))+

3.1.6 - Time Zone Indicators

Validations and time comparisons will use the Zulu (Z) time zone when a time zone is absent. It is recommended that the optional time zone be specified either as Zulu (Z) or as ±hh:mm where applicable.

3.1.7 - Information Security Markings (ISM.XML)

Most constraint rules specific to the application of information security markings are documented in the ISM.XML^[22] specification and related documents. The rules in this section are additional constraints on the specific implementation of ISM.XML^[22] in PUBS.XML.

3.2 - Data Rendering Constraint Rules

3.2.1 - Purpose

Rendering rules define constraints on the rendering and display of PUBS.XML documents. The intent is to inform the development of systems capable of rendering or displaying PUBS.XML data for use by individuals not familiar with the details of the PUBS.XML markup. While expressed in a similar manner to the data validation constraint rules above, there is no expectation that evaluation of these rules can be automated; rather these rules should inform the evaluation of a system's capabilities and functionality.

3.2.2 - Rendering Constraint Rules

The following table contains the information for the PUBS.XML data rendering constraint rules.

Table 4 - Constraint Rules

Rule Number	Severity	Description	Human Readable Description
[PUBS- RENDER-00001]	[Error]	When element rr:RevisionRecall is present the text of the attribute @rr:revisionType shall be rendered in uppercase as the first part of the document title immediately following the classification portion mark and will be followed with a “.”.	Systems used for rendering data containing the <i>XML Data Encoding Specification for Revision Recall</i> (REVRECALL.XML ^[33]) element will produce rendered documents that comply with the Director of National Intelligence (DNI) Revision Recall memo, <i>Intelligence Community Standards and Procedures for Revised or Recalled Intelligence Products</i> ^[5] , August 5, 2005, and the specific style described.

Appendix A Feature Summary

Rendering rules define constraints on the rendering and display of PUBS.XML documents. The intent is to inform the development of systems capable of rendering or displaying PUBS.XML data for use by individuals not familiar with the details of the PUBS.XML markup. While expressed in a similar manner to the data validation constraint rules above, there is no expectation that evaluation of these rules can be automated; instead, these rules should inform the evaluation of a system’s capabilities and functionality.

Table 5 - Feature Summary Legend

Key	Description
F	Full (able to comply and verified by spec to some degree)
P	Partial (Able to comply but not verifiable)
N	Non-compliance (Can’t comply)
N/A	Not Applicable. Feature is no longer required.
Cell Colors represent the same information as the Key value	

A.1. PUBS Feature Summary

A.1.1. Features from V2015-AUG to V2018-APRr2022-MAY

Table 6 - PUBS.XML Feature Comparison V2015-AUG to V2018-APRr2022-MAY

Required date	Feature	V2015-AUG	V2016-SEP	V2018-APR	V2018-APRr2022-MAY
	Reference to external CVE for MIME	N	F	F	F
	Updating PUBS.XML to use CEM.XML ^[3] specification	N	N	F	F
	Updating to remove references to DDMS ^[4] now that it has been absorbed into the IRM.XML ^[21] specification	N	N	N	F
	Updating to remove references to NTK.XML ^[31] now that it has been absorbed into the ISM.XML ^[22] specification	N	N	N	F
	Updating Date/Time rules to account for Time Zones.	N	N	N	F
	Updating codes for Currency ISO 4217	N	N	N	F

A.1.1.1. Features Partial and N/A from V2015-AUG to V2018-APRr2022-MAY

Table 7 - PUBS.XML Feature Comparison V2015-AUG to V2018-APRr2022-MAY

Required date	Feature	V2015-AUG	V2016-SEP	V2018-APR	V2018-APRr2022-MAY
	DNI Revision Recall ^[5]	N/A ^{aa}	N/A ^{aa}	N/A ^{aa}	N/A ^{aa}

A.1.2. Features from V11 to V2015-AUG

Table 8 - PUBS.XML Feature Comparison V11 to V2015-AUG

Required date	Feature	V11	V12	V2014-DEC	V2015-AUG
	DNI Revision Recall ^[5]	F	F	N/A ^a	N/A ^{aa}
	ISM.XML ^[22] tables	N	F	F	F
	Updating PUBS to use Source Reference Citation (SRC) specification	N	N	N	F
	Reference to external CVE for IntelDiscipline	N	N	N	F
	Reference to external CVE for pubs:Agency edh:ResponsibleEntityType	N	N	N	F

^aThis feature is now supported through the use of a RevRecall assertion.

A.1.2.1. Features Partial and N/A from V11 to V2015-AUG

Table 9 - PUBS.XML Feature Comparison V11 to V2015-AUG

Required date	Feature	V11	V12	V2014-DEC	V2015-AUG
	DNI Revision Recall ^[5]	F	F	N/A ^a	N/A ^{aa}

^aThis feature is now supported through the use of a RevRecall assertion.

A.1.3. Features from V8 to V11

Table 10 - PUBS.XML Feature Comparison V8 to V11

Required date	Feature	V8	V9	V10	V11
	Allow Documents starting with a Section	N	F	F	F
	Time with more than 3 decimal precision	N	F	F	F
	Classification on AudienceVariation and AlternateFormatType	N	F	F	F
	Use of Information Resource Metadata (IRM) for most of IntelDocMetadata	N	N	F	F
	Use TDO as container for all Intelligence Publications (PUBS) components	N	N	N	F
	Version decoupling, allowing import of any version of ISM.XML ^[22] and other dependent specifications at or above ISM.XML ^[22] v9+, NTK.XML ^[31] v7+, ARH.XML ^[1] v1+, and IC-EDH.XML ^[8] v1+.	N	N	N	F

A.1.4. Features from V5 to V8

Table 11 - PUBS.XML Feature Comparison V5 to V8

Required date	Feature	V5	V6	V7	V8
	Forbade use of ISO 3166-1 ^[26] Digraph/Numeric codes	N	F	F	F
	Schematron ^[34] Implementation of rules	N	F	F	F
	SouthSudan	N	N	F	F
	irm:ProcessingInfoList support	N	N	F	F
	DateReceived	N	N	F	F
	Schema validation of CVE values	N	N	F	F
	CityName element	N	N	F	F
	Security Mark SourcedText	P	P	F	F
	Linking (XLink) 1.1 ^[37]	N	N	F	F
	ORCON Memo support ^[32]	P	P	F	F
	Equation Element useable	F	N	N	F
	decimalDegreeCoordinates on several elements	N	N	N	F

A.1.5. Features from V2 to V5

Table 12 - PUBS.XML Feature Comparison V2 to V5

Required date	Feature	V2	V3	V4	V5
	Use Need-To-Know Metadata (NTK)	N	F	F	F
	Use ProductionMetrics	N	F	F	F
	RecordKeeper RecordsManagementInfo	N	N	F	F
	National Human Intelligence (HUMINT) Requests: <ul style="list-style-type: none">• Non State Actor support• Approximable Dates• CollectionSource• DateAcquired• Attachments	N	N	N	F
	MIME Types	N	N	N	F
	National HUMINT Requests-2: <ul style="list-style-type: none">• SubCountryCodes• Ordering of CountryCode or SubCountry or NonState	N	N	N	F

Required date	Feature	V2	V3	V4	V5
	CityName element	N	N	F	N
	Allow Documents starting with a Section	F	F	F	N

A.1.5.1. Features Partial and N/A from V2 to V5

Table 13 - PUBS.XML Feature Comparison V2 to V5

Required date	Feature	V2	V3	V4	V5
	Security Mark SourcedText	P	P	P	P
	ORCON Memo support ^[32]	P	P	P	P

A.1.6. Features from V1 to V2

Table 14 - PUBS.XML Feature Comparison V1 to V2

Required date	Feature	V1	V2
	Support ICD 206 ^[11]	P	F
	DNI Revision Recall ^[5]	N	F

A.1.6.1. Features Partial and N/A from V1 to V2

Table 15 - PUBS.XML Feature Comparison V1 to V2

Required date	Feature	V1	V2
	Security Mark SourcedText	P	P
	ORCON Memo support ^[32]	P	P

Appendix B Change History

The following table summarizes the version identifier history for this DES.

Table 16 - DES Version Identifier History

Version	Date	Purpose
1.0	August 2008	Initial Release
2	December 24, 2009	Routine revision to technical specification. For details of changes, see Section B.16 - V2 Change Summary
3	May 11, 2010	Routine revision to technical specification. For details of changes, see Section B.15 - V3 Change Summary
4	September 7, 2010	Routine revision to technical specification. For details of changes, see Section B.14 - V4 Change Summary
5	December 6, 2010	Routine revision to technical specification. For details of changes, see Section B.13 - V5 Change Summary
6	April 11, 2011	Routine revision to technical specification. For details of changes, see Section B.12 - V6 Change Summary
7	September 19, 2011	Routine revision to technical specification. For details of changes, see Section B.11 - V7 Change Summary
8	December 7, 2011	Routine revision to technical specification. For details of changes, see Section B.10 - V8 Change Summary
9	February 27, 2012	Routine revision to technical specification. For details of changes, see Section B.9 - V9 Change Summary
10	July 17, 2012	Routine revision to technical specification. For details of changes, see Section B.8 - V10 Change Summary
11	January 21, 2013	Routine revision to technical specification. For details of changes, see Section B.7 - V11 Change Summary
12	April 5, 2013	Routine revision to technical specification. For details of changes, see Section B.6 - V12 Change Summary
2014-DEC	December 4, 2014	Routine revision to technical specification. For details of changes, see Section B.5 - V2014-DEC Change Summary

Version	Date	Purpose
2015-AUG	August 13, 2015	Routine revision to technical specification. For details of changes, see Section B.4 - V2015-AUG Change Summary
2016-SEP	September 9, 2016	Routine revision to technical specification. For details of changes, see Section B.3 - V2016-SEP Change Summary
2018-APR	April 20, 2018	Routine revision to technical specification. For details of changes, see Section B.2 - V2018-APR Change Summary
2018-APRr2022-MAY	May 13, 2022	Routine revision to technical specification. For details of changes, see Section B.1 - V2018-APRr2022-MAY Change Summary

B.1 - V2018-APRr2022-MAY Change Summary

Significant drivers for Version 2018-APRr2022-MAY include:

- Community Change Requests

[Table 17](#) summarizes the changes made to V2018-APR in developing V2018-APRr2022-MAY.

Table 17 - Data Encoding Specification V2018-APRr2022-MAY Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Removed the Dependency Over Time table. (CR-2019-038)	Documentation	No impact to systems.
2	Update implementation notes in the schema and schema guide schema. (CR-2021-017)	Schema	No impact to systems
3	Updated documentation to use the specification framework. (CR-2019-038)	Documentation	No impact to systems.
4	Update codes for Currency ISO 4217. (CR-2019-077)	CVE “CVCEnum-ISO4217Numeric” updated “CVCEnum-ISO4217Trigraph” updated	No impact to systems.

#	Change	Artifacts changed	Compatibility Notes
5	Update PUBS with environment validation schematron rules for its direct dependencies. (CR-2017-095)	Schematron PUBS-ID-00114 modified PUBS-ID-00118 modified PUBS-ID-00120 modified PUBS-ID-00123 modified PUBS-ID-00124 modified PUBS-ID-00125 deleted PUBS-ID-00126 deleted PUBS-ID-00127 modified PUBS-ID-00128 modified PUBS-ID-00132 added	Data generation and ingestion systems need to be updated to support the latest version of the schema.
6	Update version attributes for PUBS direct dependencies on PubsRootNodeAttributeGroup (CR-2017-141)	Documentation Schema Schematron PUBS-ID-00119 modified PUBS-ID-00121 modified PUBS-ID-00129 modified PUBS-ID-00131 modified PUBS-ID-00133 added PUBS-ID-00134 added	Data generation and ingestion systems need to be updated to support the latest version of the schema.

#	Change	Artifacts changed	Compatibility Notes
7	Update PUBS to no longer depend on DDMS (CR-2022-011)	Documentation Schema Schematron PUBS-ID-00001 modified PUBS-ID-00003 modified PUBS-ID-00040 modified PUBS-ID-00045 modified PUBS-ID-00046 modified PUBS-ID-00047 modified PUBS-ID-00048 modified PUBS-ID-00049 modified PUBS-ID-00050 modified PUBS-ID-00054 modified PUBS-ID-00070 modified PUBS-ID-00079 modified PUBS-ID-00110 deleted PUBS-ID-00111 modified PUBS-ID-00122 deleted	Data generation and ingestion systems need to be updated to support the latest version of the schema.

#	Change	Artifacts changed	Compatibility Notes
8	Update PUBS Date-Time Rules to Account for Time Zones (CR-2018-120)	Documentation Schema Schematron DateListYearRangeRule.sch modified DateYearRangeRule.sch modified PUBS_XML.sch modified PUBS-ID-00042 modified	Data generation and ingestion systems need to be updated to support the latest version of the schema.
9	Updated documentation to reference the ISM.XML specification instead of the now retired NTK.XML specification. (CR-2022-013)	Documentation	No impact to systems.
10	Update Dependency table to point to the appropriate law or policy. (CR-2019-157)	Documentation	No impact to systems.

B.2 - V2018-APR Change Summary

Significant drivers for Version 2018-APR include:

- Community Change Requests

The following table summarizes the changes made to V2016-SEP in developing V2018-APR.

Table 18 - Data Encoding Specification V2018-APR Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Removed PUBS orphans (Activity, Addressee, BoundingBox, BoundingGeometry, DateValidTil, InternalID, NetworkAddress, PlaceName, ProductLine, Region, ReportingLevel, RequesterInfo, Temporal, VitalRecordIndicator, ActivityType, BoundingBoxType, BoundingGeometryType, TimePeriod, ApproximableDate-TimeEnd, ApproximableDate-TimeStart) (CR-2016-053)	Schema	No impact to systems.
2	Deleted PUBS-ID-00081 which was enforcing old source citation policy. (CR-2016-075)	Schematron PUBS-ID-00081 deleted	Data generation and ingestion systems need to be updated to accommodate the changes.
3	Added @virt:DESVersion to pubs:PubsRootNodeAttribute-Group and updated PUBS-ID-00129 to look for @virt:DESVersion on pubs:IntelDoc or pubs:IntelDocMetadata. (CR-2016-089)	Schema Schematron PUBS-ID-00129 modified	Data generation and ingestion systems need to be updated to accommodate the changes.
4	Create RelaxNG CVE Fragments for PUBS. (CR-2017-185)	CVEs	No impact to systems.
5	Added DESVersion warning enforcement rule and updated schema version restriction to align with version and revision strategy. Added Revision Constraints section to DES. (CR-2017-092)	Documentation Schema Schematron PUBS-ID-00130 added PUBS_XML.sch modified	Data generation and ingestion systems need to be updated to accommodate the changes.

#	Change	Artifacts changed	Compatibility Notes
6	Updated list of elements that are required to have a timezone when a time designator exists. (CR-2017-163)	Schema Schematron PUBS-ID-00054 modified PUBS-ID-00055 deleted PUBS_XML.sch modified	Systems need to be updated to enforce the new restriction.

#	Change	Artifacts changed	Compatibility Notes
7	<p>Extracted pubs:DescriptiveElementsGroup and CVEs used only by the extracted inline elements into the CEM.XML^[3] specification.</p> <p>Added schematron rule to enforce existence of optional cem:DESVersion attribute when CEM.XML elements are used in PUBS.XML and updated schematron rules impacted by elements moved from PUBS.XML to CEM.XML. (CR-2017-167)</p>	<p>CVE</p> <p>CVEnum-PubsCityCategory.xml deleted</p> <p>CVEnum-PubsCommData-Type.xml deleted</p> <p>CVEnumPubsIdentifier-Type.xml deleted</p> <p>Schema</p> <p>Schematron</p> <p>PUBS-ID-00001 modified</p> <p>PUBS-ID-00017 modified</p> <p>PUBS-ID-00029 deleted</p> <p>PUBS-ID-00044 deleted</p> <p>PUBS-ID-00062 modified</p> <p>PUBS-ID-00063 modified</p> <p>PUBS-ID-00064 modified</p> <p>PUBS-ID-00072 modified</p> <p>PUBS-ID-00096 modified</p> <p>PUBS-ID-00099 modified</p> <p>PUBS-ID-00131 added</p> <p>PUBS_XML.sch modified</p>	<p>Data generation and ingestion systems need to be updated to accommodate the changes.</p>

#	Change	Artifacts changed	Compatibility Notes
8	Added inverse dependency section and definitions for Dependencies and Inverse Dependencies. (CR-2017-278)	Documentation	No impact to systems.
9	Added CEM.XML to the Dependency Over Time table. (CR-2017-281)	Documentation	No impact to systems.
10	Update the version numbering EBNF to reflect the existence of Revisions. (CR-2017-255)	Documentation	No impact to systems.
11	Create JSON version of CVEs in PUBS (CR-2017-066)	CVEs	No impact to systems.
12	Create CSV version of CVEs in PUBS (CR-2017-044)	CVEs	No impact to systems.
13	Added schema PDF. (CR-2018-032)	Documentation	No impact to systems.
14	Added ISM.XML ^[22] attributes to Schematron files to mark up the documentation. (CR-2017-313)	Schematron	No impact to systems.
15	Removed "we" from rule description per Change request (CR-2017-213).	PUBS-ID-00086 modified	No impact to systems.
16	Added @id and @role to all sch:rule elements, in support of commercial tools warnings and errors and to support open source unit testing frameworks. (CR-2017-230)	All non-abstract Schematron rules modified	No impact to existing systems. Additional capabilities.
17	Updated CSV generation to include a column for deprecation date information. (CR-2018-091)	CSV	Systems using CSVs no longer have to look to the XML or JSON for the deprecation date information.
18	Changed "Multipurpose Internet Mail Extensions" to "Media Type". (CR-2018-057)	Documentation	No impact to systems.

B.3 - V2016-SEP Change Summary

Significant drivers for Version 2016-SEP include:

- Consolidation of MIME types into MIME.CES and its use in other specs.

The following table summarizes the changes made to V2015-AUG in developing V2016-SEP.

Table 19 - Data Encoding Specification V2016-SEP Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Updated PUBS to use MIME CVE instead of PUBS CVE for MIME types. (CR-2015-048)	Schematron PUBS_XML.sch updated PUBS-ID-00075 deleted	Data generation and ingestion systems need to be updated to enforce the modified rule.
2	Added optional MIME.CES ^[30] and Intelligence Discipline (INTDIS) CESVersion attributes to PUBS attribute group. (CR-2015-048)	Schema IC-PUBS.xsd updated. Schematron PUBS-ID-00118 added PUBS-ID-00119 added PUBS-ID-00120 added PUBS-ID-00121 added	Data generation and ingestion systems need to be updated to enforce the modified rule.
3	Removed PUBS mime type CVE (CR-2015-048)	CVE CVEnumPubsMime-Type.xml removed	Data generation and ingestion systems need to be updated to enforce the modified rule.
4	Update PUBS to use Department of Defense Discovery Metadata Specification (DDMS) for language codes. (CR-2014-056, CR-2016-009)	Schema Schematron PUBS-ID-00001 updated PUBS-ID-00003 updated PUBS-ID-00024 deleted PUBS-ID-00025 deleted PUBS-ID-00122 added	Data generation and ingestion systems need to be updated to enforce the modified rules.

#	Change	Artifacts changed	Compatibility Notes
5	Updated schematron rules to enforce minimum versions defined in specification dependency table 1.7.	Schematron PUBS-ID-00114 updated. PUBS-ID-00123 added. PUBS-ID-00124 added. PUBS-ID-00125 added. PUBS-ID-00126 added. PUBS-ID-00127 added. PUBS-ID-00128 added. PUBS-ID-00129 added.	Systems need to be updated to accommodate this change.
6	The schema change logs will no longer be maintained as of the 2016-SEP release. The existing change logs will only serve as legacy information. For changes to schema as of and after 2016-SEP, reference the change history in the DES	Schema	No impact to systems.
7	Restored schematron rule.	Schematron PUBS-ID-00086 restored.	Systems need to be updated to accommodate this change.
8	Update applicability section to reflect a requirement to comply with Law/Policy (CR-2016-063)	Documentation	Implementers must verify that they are complying with applicable laws and policies.

B.4 - V2015-AUG Change Summary

Significant drivers for Version 2015-AUG include:

- Update of ICD 206^[11]
- Alignment with standalone CVE specifications

The following table summarizes the changes made to V2014-DEC in developing V2015-AUG.

Table 20 - Data Encoding Specification V2015-AUG Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Updated PUBS.XML to leverage SRC.XML ^[35] for source referencing of covered analytic products. Source referencing for related resources however does NOT leverage SRC.XML and uses the pubs:SourceReference element.	DES Schema Examples Schematron PUBS-ID-00117 added PUBS-ID-00104 changed	Data generation and ingestion systems need to be updated to support the latest version of the schema.
2	Updated PUBS.XML to point to IntelDiscipline CVE	DES Schema Schematron PUBS-ID-00020 removed PUBS-ID-00021 removed	Data generation and ingestion systems need to be updated to support the latest version of the schema.
3	Updated PUBS.XML example files to use UUID instead of meaningful suffixes.	DES Examples	Data generation and ingestion systems need to be aware of the changes.
4	Updated PUBS.XML to use pubs:Agency (edh:ResponsibleEntityType) in place of pubs:AgencyAcronym to better support international agencies.	Schema Schematron PUBS-ID-00076 removed	Data generation and ingestion systems need to be updated to support the latest version of the schema and Schematron rules.
5	Updated code descriptions to improve readability.	Schematron	No impact to data generation and ingestion systems.
6	Added notation “s” indicating Strike-through to EmphasizedText’s emphasisType attribute.	Schema	Impacts data rendering systems.
7	Removed CVEnum-PubsAgencyAcronym CVE	CVEnum-PubsAgencyAcronym.xml removed	CVE no longer used in PUBS.

#	Change	Artifacts changed	Compatibility Notes
8	Update rule PUBS-ID-00081, PUBS-ID-00116 to simplify	Schematron PUBS-ID-00081 changed PUBS-ID-00116 changed	Updated rules should behave as before so no impact to systems.
9	Update to replace contexts of “[/]” with “[descendant::]” so that rules would not fire in TDC’s when they should not.	Schematron PUBS-ID-00045 changed PUBS-ID-00046 changed PUBS-ID-00047 changed PUBS-ID-00049 changed PUBS-ID-00050 changed PUBS-ID-00111 changed PUBS-ID-00110 changed PUBS-ID-00113 changed PUBS-ID-00003 changed PUBS-ID-00070 changed PUBS-ID-00079 changed	Updated rules should behave as before for TDOs so no impact to TDO systems. Systems using TDCs should see fewer errors.

B.5 - V2014-DEC Change Summary

Significant drivers for Version 2014-DEC include:

- Bring PUBS into alignment with modern versions of its dependencies.
- Maintenance revision.

The following table summarizes the changes made to V12 in developing V2014-DEC.

Table 21 - Data Encoding Specification V2014-DEC Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Corrected ISMCATCESVersion to replace 12 with 2.	CVEnum-PubsAgencyAcronym.xml	Minor correction to metadata in CVE should have minimal or no impact to implementing systems.
2	Removed the RevisionRecall element. This feature was deprecated with DDMS v4.0 and is now being removed entirely.	Schema	Data generation and ingestion systems need to be updated to support the latest version of the schema.
3	Changed DESVersion to represent the year and month of release. Also allowed for extension of specification by adding a '-' followed by a string to denote a custom implementation.	DES Schema Schematron PUBS-ID-00114 changed	Data generation and ingestion systems need to be updated to support the latest version of the schema.
4	Restored rules PUBS-ID-00020 and PUBS-ID-00021 as they were in version 10 due to use of IntelDiscipline as a child of SourceReference.	Schematron PUBS-ID-00020 restored PUBS-ID-00021 restored	Data generation and ingestion systems need to be updated to enforce the rules.
5	Updated PUBS-ID-00116 to work with TDCs	PUBS-ID-00116 changed	Data generation and ingestion systems need to be updated to enforce the rules.

B.6 - V12 Change Summary

Significant drivers for Version 12 include:

- Support for recursive eXtensible Hyper-Text Markup Language (XHTML) tables

The following table summarizes the changes made to V11 in developing V12.

Table 22 - Data Encoding Specification V12 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Removed several orphaned elements left over from the upgrade to DDMSv5 from the PUBS Schema.	Schema	Data generation and ingestion systems need to be updated to support the latest version of the schema.
2	Added XHTML tables to the PUBS Schema.	Schema	Data generation and ingestion systems need to be updated to support the new tables.

#	Change	Artifacts changed	Compatibility Notes
3	Corrected scopes of rules focused on DDMS attributes and elements to restrict DDMS assertions only.	Schematron PUBS-ID-00003 PUBS-ID-00045 PUBS-ID-00047 PUBS-ID-00049 PUBS-ID-00050 PUBS-ID-00070 PUBS-ID-00079 PUBS-ID-00110 PUBS-ID-00111	Data generation and ingestion systems need to be aware of the changes.

B.7 - V11 Change Summary

Significant drivers for Version 11 include:

- See ISM.XML^[22] V10 drivers
- See IRM V9 drivers

The following table summarizes the changes made to V10 in developing V11.

Table 23 - Data Encoding Specification V11 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Added Schematron rules to ensure that the versions of the imported specs meet the minimum allowed versions.	Schematron PUBS-ID-00114	Data generation and ingestion systems need to be updated enforce the new rules.
2	Updated the @ddms:qualifiers values in the Examples files to be actual values.	Examples	Data generation and ingestion systems should not need to be updated.

#	Change	Artifacts changed	Compatibility Notes
3	Moved several rules to IRM as they should be run whenever DDMS is present, not just if the XML Instance is a PUBS document.	<p>Schematron</p> <p>PUBS-ID-00088 Removed (IRM-ID-00075)</p> <p>PUBS-ID-00090 Removed (IRM-ID-00078)</p> <p>PUBS-ID-00105 Removed (IRM-ID-00077)</p> <p>PUBS-ID-00107 Removed (IRM-ID-00076)</p> <p>PUBS-ID-00109 Removed (IRM-ID-00074)</p>	Data generation and ingestion systems need to be updated to no longer enforce the removed rules, and instead upgraded to enforce the IRM versions.
4	Removed several rules that are covered under rules in other specifications.	<p>Schematron</p> <p>PUBS-ID-00020 Removed</p> <p>PUBS-ID-00021 Removed</p> <p>PUBS-ID-00022 Removed</p> <p>PUBS-ID-00023 Removed</p> <p>PUBS-ID-00106 Removed</p>	Data generation and ingestion systems need to be updated to no longer enforce the removed rules.
5	Modified the schematron rule for ensuring that a PUBS document has either a date posted or a date published. This was done by consolidating the context and updating the assertion tests based on that consolidation.	<p>Schematron</p> <p>PUBS-ID-00111</p>	Data generation and ingestion systems need to be updated to enforce the modified rule.
6	Added a rule to ensure that if a TDO contains a PUBS assertion, it also contains an IRM assertion.	<p>Schematron</p> <p>PUBS-ID-00113</p>	Data generation and ingestion systems need to be updated to properly enforce the new rule.

#	Change	Artifacts changed	Compatibility Notes
7	Updated the Globally Unique Identifiers for Everything (GUIDE) id in the example files to comply with the updated regex in IRM-ID-00062. The updated rule ensures there are no additional characters before or after the id.	Examples	Data generation and ingest systems complying with the GUIDE id rules do not need to be updated. Systems that were allowing invalid GUIDE ids will need to be updated to comply with the constraint rule.
8	PUBS is now designed to live inside of a TrustedDataObject resulting in splitting the PublicationsMetadata part and the DocumentBody part into two independent root nodes named IntelDocMetadata and IntelDoc respectably.	Schema Schematron	Data generation and ingest systems will have to be updated to handle the new TDO formatted PUBS instances.
9	IRM removed from PublicationsMetadata and now resides in its own peer assertion in a TrustedDataObject.	Schema Schematron	Data generation and ingestion systems need to be updated to ensure they are properly using the new structures.
10	DDMS resides in its own assertion in a TrustedDataObject separate from IRM so Xpaths in Schematron rules had to be updated.	Schematron	Data generation and ingestion systems need to be aware of the changes.

#	Change	Artifacts changed	Compatibility Notes
11	Removed rules found to be duplicative of rules in or belonging to IRM	PUBS-ID-00056 Removed PUBS-ID-00057 Removed PUBS-ID-00058 Removed PUBS-ID-00059 Removed PUBS-ID-00060 Removed PUBS-ID-00061 Removed PUBS-ID-00074 Removed PUBS-ID-00086 Removed PUBS-ID-00089 Removed	
12	Updated Mime Types to current IANA list + DNI types +application/x-autocad.	CVEnumPubsMimeType	Data generation and ingest systems will have to be updated to handle the new mime values.
13	Added @identifierType to both pubs:Identifier and pubs:InfoBearer.	Schema CVEnumPubsIdentifier-Type	Data generation and ingest systems will have to be updated to handle the existence of new attributes.
14	Version decoupling, allowing import of any version of ISM.XML ^[22] and other dependent specifications at or above ISM.XML ^[22] v9+, NTK.XML ^[31] v7+, ARH.XML ^[1] v1+, and IC-EDH.XML ^[8] v1+.	DES	Data ingestion systems need to be aware of this change and ensure they check appropriate dependent spec versions for validation.
15	Updated Schema to ISM.XML ^[22] v10.	Schema	Updated the Schema itself to use ism:DESVersion to 10 to mark the xsd schema instance with classification markings.

#	Change	Artifacts changed	Compatibility Notes
16	Removed support for CVEnum-PubsCountryFIPSDigraph.xml.	Schema Changed PUBS-ID-00071 Removed CVEnumPubsCountry-FIPSDigraph Removed	Data generation and ingest systems will have to be updated to support the current ISM.XML ^[22] values.
17	Removed ORCON POC related rules as ISM.XML ^[22] .ISM.XML ^[22] .V10 removed ORCON POC.	Schematron PUBS-ID-00102 Removed	Data generation and ingestion systems need to be updated to no longer use rule
18	Updated to use VIRT.XML ^[36] instead of ISM.XML ^[22] Common for virtual coverage concepts.	Schematron PUBS-ID-00037 Removed PUBS-ID-00038 Removed PUBS-ID-00039 Removed Schema updated to use Virtual Coverage (VIRT) instead of IC Common NetworkAttributesGroup and link attributes groups	Data generation and ingestion systems need to be updated to no longer use these rules, and to expect VIRT instead of IC Common for virtual coverage concepts including: NetworkAttributesGroup, SimpleOrResourceLinkAttributesGroup, SimpleOrExtendedLinkAttributesGroup, SimpleLinkAttributesGroup, RequiredSimpleLinkAttributesGroup, OptionalResourceLinkAttributesGroup.
19	Added Cabinet Offices to CVEnumPubsAgencyAcronym.	CVE	Data generation and ingestion systems need to be updated to use the correct CVE definitions and values.

B.8 - V10 Change Summary

Significant drivers for Version 10 include:

- See ISM.XML^[22] V9 drivers
- Common Metadata Standards Tiger Team (CMSTT) for IRM.XML^[21] in PUBS.XML
- See ADD V3 drivers

The following table summarizes the changes made to V9 in developing V10.

Table 24 - Data Encoding Specification V10 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Updated Information Security Markings (ISM) to V9, NTK to V7, IRM to V8.	Schema	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.

#	Change	Artifacts changed	Compatibility Notes
2	Replace most of PUBS metadata with IRM.	<p>Schema</p> <p>PUBS-ID-00001 Changed</p> <p>PUBS-ID-00003 Changed</p> <p>PUBS-ID-00007 Removed</p> <p>PUBS-ID-00015 Changed</p> <p>PUBS-ID-00018 Removed</p> <p>PUBS-ID-00019 Removed</p> <p>PUBS-ID-00020 Changed</p> <p>PUBS-ID-00021 Changed</p> <p>PUBS-ID-00022 Changed</p> <p>PUBS-ID-00023 Changed</p> <p>PUBS-ID-00024 Changed</p> <p>PUBS-ID-00026 Removed</p> <p>PUBS-ID-00029 Changed</p> <p>PUBS-ID-00039 Changed</p> <p>PUBS-ID-00040 Changed</p> <p>PUBS-ID-00041 Changed</p>	Data generation and ingestion systems need to be updated to ensure they are properly using the new structures.

#	Change	Artifacts changed	Compatibility Notes
		PUBS-ID-00045 Changed	
		PUBS-ID-00046 Changed	
		PUBS-ID-00047 Changed	
		PUBS-ID-00048 Changed	
		PUBS-ID-00049 Changed	
		PUBS-ID-00050 Changed	
		PUBS-ID-00053 Changed	
		PUBS-ID-00054 Changed	
		PUBS-ID-00056 Changed	
		PUBS-ID-00057 Changed	
		PUBS-ID-00058 Changed	
		PUBS-ID-00059 Changed	
		PUBS-ID-00060 Changed	
		PUBS-ID-00061 Changed	
		PUBS-ID-00065 Changed	
		PUBS-ID-00066 Removed	
		PUBS-ID-00068 Removed	

#	Change	Artifacts changed	Compatibility Notes
		PUBS-ID-00070 Changed	
		PUBS-ID-00074 Changed	
		PUBS-ID-00079 Changed	
		PUBS-ID-00087 Changed	
		PUBS-ID-00088 Changed	
		PUBS-ID-00089 Changed	
		PUBS-ID-00090 Changed	
		PUBS-ID-00091 Removed	
		PUBS-ID-00094 Removed	
		PUBS-ID-00105 Added	
		PUBS-ID-00106 Added	
		PUBS-ID-00107 Added	
		PUBS-ID-00108 Added	
		PUBS-ID-00108 Removed	
		PUBS-ID-00109 Added	
		PUBS-ID-00110 Added	
		PUBS-ID-00111 Added	
		CVEnumPubsCoverage- FIPSDigraph Removed	
		CVEnumPubsCoverage- ISO3166Trigraph Removed	

#	Change	Artifacts changed	Compatibility Notes
		CVEnumPubsIntelSub-disciplines Removed CVEnumPubsIntelSub-disciplineTechniques Removed	
3	Update mapping to ADD.	DES	Should not impact data.
4	Added support for alphanumeric @@DESVersion identifiers [artf12167].	Schema	Should not impact data but ingestion systems may need to account for it.
5	Changed Language/@encoding to be a required attribute.	Schema	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
6	Updated PUBS-ID-00082 to allow ism:noticeType to be used on AuthorInfo, CoauthorInfo, ContributingAuthorInfo, and POCinfo in addition to the existing IntelDoc, Note, NoteInline. [artf12263]	Schematron	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
7	Updated PUBS-ID-00102 to only fire when ism:noticeType is used on AuthorInfo, CoauthorInfo, ContributingAuthorInfo, and POCinfo. [artf12234]	Schematron PUBS-ID-00102 Added	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
8	Updated schema to no longer require pubs:QuantityReference on pubs:Money. [artf12264]	Schema	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
9	Updated several rules to handle multiple occurrences of text objects such as phone numbers.	PUBS-ID-00065 Changed PUBS-ID-00102 Changed PUBS-ID-00105 Changed	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.

B.9 - V9 Change Summary

Significant drivers for Version 9 include:

- See ISM.XML^[22] V8 drivers

- CMSTT for AudienceVariation changes
- National Information Exchange Model (NIEM)

The following table summarizes the changes made to V8 in developing V9.

Table 25 - Data Encoding Specification V9 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Updated ISM to V8, NTK to V6, IRM to V7.	Schema	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
2	Added unique namespaces to generated CVE schema fragments. Moved schema fragment imports to the base schema.	Schema CVEs	Should not affect data.
3	Removed CVEGenerated schema import from and moved schema fragment imports directly to the base schema.	Schema	Impacts schema designers only. Instance documents do not change.
4	Added unique namespaces to generated CVE schema fragments. Moved schema fragment imports to the base schema.	Schema CVEs	Should not affect data.
5	Updated definitions for DateTimeReferenced and DateInformation [artf7487].	Schema	Data generation and ingestion systems need to be updated to ensure they are properly using DateTimeReferenced and DateInformation based on the clarified definitions.
6	Changed Note to not allow mixed content.	Schema	Data generation and ingestion systems need to be updated to properly enforce the new structure.
7	Removed PUBS-ID-00043 so times are no longer constrained to 3 decimal places.	PUBS-ID-00043	Data generation and ingestion systems need to be updated to properly handle the greater precision now possible.
8	Added Classification to Audience Variation and AlternateFormatType.	Schema	Data generation and ingestion systems need to be updated to properly handle the security markings on the links.

#	Change	Artifacts changed	Compatibility Notes
9	Updated PUBS-ID-00008 to allow for documents starting with a Section to be valid.	PUBS-ID-00008	Data generation and ingestion systems need to be updated to properly handle the new structures now possible.
10	Added PUBS-ID-00104 to verify a source citation exists on USA documents with Foreign Government Information Foreign Government Information (FGI)	PUBS-ID-00104	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rules.

B.10 - V8 Change Summary

Significant drivers for Version 8 include:

- DDMS^[4] and IRM.XML^[21] Harmonization
- CMSTT for several new elements

The following table summarizes the changes made to V7 in developing V8.

Table 26 - Data Encoding Specification V8 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Updated ProductionMetricsList , ProcessingInfoList , Order-AttributeGroup , NonState-ActorCoverageList , RecordsManagementInfo , RecordKeeper , and subDivisionCode to properly reference harmonized IRM/DDMS 4.0 elements and attributes.	Schema Constraint Rules	Data generation and ingestion systems need to be updated to comply with all constraint rules in these sub-specifications as well as schema changes.
2	Updated IRM to V6 and DDMS ^[4] to V4.0.1.	Schema	Data generation and ingestion systems need to be updated to properly enforce the new constraint rules.
3	Created @decimalDegreeCoordinates attribute in coordinates-AttributeGroup and added the group to GeoRef , GeoFeature , CountryName , CityName , LocationOfInterest , and Facility .	Schema	Data generation and ingestion systems need to be updated to handle the new optional attribute group.

#	Change	Artifacts changed	Compatibility Notes
4	Corrected the Equation element's definition to the V5 format. V6 had introduced an error.	Schema	Data generation and ingestion systems need to be updated to handle the corrected definition.
5	Modified rule PUBS-ID-00001: removed ddms:countryCode, added ddms:NonStateActor.	PUBS-ID-00001 Changed	Data generation and ingestion systems need to be updated to use the new values. Note: Data generated under previous releases may not be valid under this release.

B.11 - V7 Change Summary

Significant drivers for Version 7 include:

- See ISM.XML^[22] V7 drivers
- ISO 3166-1^[26]
- DNI ORCON Memo^[32]
- CMSTT for several new elements
- XLink 1.1^[37]
- Joint Chiefs of Staff Pub 2.0: Appendix B - Intelligence Disciplines^[29]

The following table summarizes the changes made to V6 in developing V7.

Table 27 - Data Encoding Specification V7 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Updated ISM to V7, IRM and NTK to V5.	Schema Constraint Rules	Data generation and ingestion systems need to be updated to comply with all constraint rules in these sub-specifications.
2	Updated the regular expression defining dateTimePairsType to ensure validation in a wider set of XML editors.	Schema	Should not impact data since intent of the new expressions are the same.
3	Replaced "\d" in regular expressions to the more specific "[0-9]."	Schema Constraint Rules	Should not impact data since intent of the new expressions is the same.

#	Change	Artifacts changed	Compatibility Notes
4	Moved ODNI specific XLink attribute groups from IC-XLink schema to IC-Common.	Schema	Should not impact data.
5	Replaced references to irm:NoticeList to new NoteList element to allow child element Note to represent security notices similar to the ism:NoticeList elements. Note was changed to have child elements in BlockObjectsGroup and attributes in ISMNotice-AttributeGroup and POC-AttributeGroup .	Schema PUBS-ID-00001 Changed	Data generation and ingestion systems need to be updated to use the new values. Note: Data generated under previous releases may not be valid under this release.
6	Added CityName with attribute @category and TransportationNetwork elements to RunningTextType to add to the set of Geo-locational markup objects. The @category attribute has a controlled vocabulary.	Schema CVEnum- PubsCityCategory Added	Data generation and ingestion systems need to be updated to use the new values.
7	Added SecurityAttributes-OptionsGroup to the SourcedText element.	Schema	Data generation and ingestion system need to be updated to use the new attributes.
8	Updated XLink [37] to version 1.1, which further restricts the types of certain attributes and added xlink constraint rules.	PUBS-ID-00096 Added PUBS-ID-00097 Added PUBS-ID-00098 Added PUBS-ID-00099 Added PUBS-ID-00100 Added PUBS-ID-00101 Added	Data generation and ingestion system need to be updated to use the new rules. Note: Data generated under previous releases may not be valid under this release.
9	Allowed ISM Notice Attributes on the IntelDoc element.	PUBS-ID-00082 Changed	Data generation and ingestion system need to be updated to use the new rules.

#	Change	Artifacts changed	Compatibility Notes
10	Added new PersonalProfileType to define elements in the PersonalProfileGroup , as well as the CommonAttributesGroup and SecurityAttributesGroup ; Affects Addressee and RequestorInfo .	Schema	Should not impact data as the elements and attributes defined in the new type are the same as those that were previously defined.
11	Added support for ORCON memos and points-of-contact by extending PersonalProfileType to include ism:POCAttributesGroup ; affects elements Note , AuthorInfo , CoauthorInfo , POCinfo and ContributingAuthorInfo .	Schema PUBS-ID-00102 Added	Data generation and ingestion systems need to be updated to use the new values and comply with the new constraint rules. Note: Data generated under previous releases may not be valid under this release.
12	Restricted CommData/@commDataType with a controlled vocabulary enumeration.	Schema	Data generation and ingestion systems need to be updated to use the new values. Note: Data generated under previous releases may not be valid under this release.
13	Fixed type errors generated when using a schema-aware processor.	Constraint Rules	Should not affect data.
14	Added DateReceived element to track when a product is received from an external source.	Schema PUBS-ID-00040 Changed PUBS-ID-00043 Changed PUBS-ID-00054 Changed	Data generation and ingestion systems need to be updated to use the new values and adhere to the new rules.
15	Referenced irm:ProcessingInfoList element from AdministrativeMetadata to track when a product is modified post-production.	Schema	Data generation and ingestion systems need to be updated to use the new values.

#	Change	Artifacts changed	Compatibility Notes
16	Changed references to attribute @ism:notice to reference the ism:ISMNoticeAttributeGroup instead to allow full conformance with ISM rules.	Schema	Data generation and ingestion systems may need to be updated to use the now available notice attributes.
17	Updated Intelligence Discipline and Subdiscipline CVE values in accordance with JP 2-0: Joint Intelligence ^[29] .	CVEnumPubsIntel Disciplines.xml, CVEnumPubsIntel SubDisciplines.xml	Data generation and ingestion systems need to be updated to use the updated CVE values.
18	Added rule that prevents @noteType from being applied to an element with @ism:noticeType or @ism:unregisteredNoticeType .	PUBS-ID-00193 Added	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rules.
19	Added country code for South Sudan to the ISO 3166-1 ^[26] CVEs.	CVEnumISMFGIOpen Changed CVEnum-ISMFGIProtected Changed CVEnum-ISMOwnerProducer Changed CVEnumISMRelTo Changed	Data generation and Ingestion systems need to be updated to properly use the new values.

B.12 - V6 Change Summary

Significant drivers for Version 6 include:

- See ISM.XML^[22] V6 drivers
- ISO 3166-1^[26]
- National HUMINT Director for several new markups

The following table summarizes the changes made to V5 in developing V6.

Table 28 - Data Encoding Specification V6 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Change encoding of constraint rules from text to Schematron.	Documentation Constraint Rules	Other than rules whose changes are noted below this should only result in more clarity of definition for the rules.
2	Use ISM.XML.V6 and IRM.XML.V4.	Schema	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rules.
3	Remove support for ISO 3166-1 ^[26] Numeric codes.	PUBS-ID-00069 Removed PUBS-ID-00073 Removed CVPubCountry-ISO3166Numeric Removed CVPubCoverage-ISO3166Numeric Removed	Data generation and Ingestion systems need to be updated to not use these values anymore and to properly enforce only the remaining constraint rules.
4	Remove support for ISO 3166-1 ^[26] Digraph codes.	PUBS-ID-00067 Removed CVPubCountry-ISO3166Digraph Removed	Data generation and Ingestion systems need to be updated to not use these values anymore and to properly enforce only the remaining constraint rules.
5	Remove element DateInformation from PUBS-ID-00054.	PUBS-ID-00054 Changed	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rule.
6	Replaced PUBS-ID-00002 and PUBS-ID-00016 with PUBS-ID-00093.	Documentation PUBS-ID-00002 Removed PUBS-ID-00016 Removed PUBS-ID-00093 Added	Data generation and Ingestion systems need to be updated to use the values. Note: Data valid under previous releases may not be valid under this release.
7	Element DateString must have content.	PUBS-ID-00003 Changed	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rule.

#	Change	Artifacts changed	Compatibility Notes
8	Remove PUBS-ID-00011.	PUBS-ID-00011 Removed	Data generation and Ingestion systems need to be updated to properly enforce only the remaining constraint rules.
9	Update ISO 3166-1 ^[26] Trigraph CVEs.	CVEnumPubsCountry-ISO3166Trigraph Changed CVEnumPubsCoverage-ISO3166Trigraph Changed	Data generation and Ingestion systems need to be updated to use the values. Note: Data valid under previous releases may not be valid under this release.
10	Update ISO 3166-1 ^[26] Digraph CVEs.	CVEnumPubsCoverage-ISO3166Digraph Changed	Data generation and Ingestion systems need to be updated to use the values. Note: Data valid under previous releases may not be valid under this release.
11	Update Federal Information Processing Standards (FIPS) Digraph CVEs.	CVEnumPubsCountry-FIPSDigraph Changed CVEnumPubsCoverage-FIPSDigraph Changed	Data generation and Ingestion systems need to be updated to use the values. Note: Data valid under previous releases may not be valid under this release.
12	Added support for irm:SubCountryCode to further refine the pubs:CountryCode element.	Documentation Schema PUBS-ID-00001 Changed PUBS-ID-00095 Added	Data generation and Ingestion systems need to be updated to use the values and properly enforce the new constraint rules.
13	Added irm:CountryCode , irm:SubCountryCode , and irm:NonStateActor to check for non-null values.	PUBS-ID-00001 Changed	Data generation and Ingestion systems need to be updated to properly enforce the revised constraint rules.
14	Added support for irm:order attribute to define a sequential ordering of pubs:CountryCode elements.	Documentation Schema PUBS-ID-00094 Added	Data generation and Ingestion systems need to be updated to use the values and properly enforce the new constraint rules.
15	Remove constraints related to @compliesWith ICD 710 ^[16] .	PUBS-ID-00085 Removed	Data generation and Ingestion systems need to be updated to no longer enforce this constraint.

B.13 - V5 Change Summary

Significant drivers for Version 5 include:

- See ISM.XML^[22] V5 drivers
- CMSTT for new markup
- National HUMINT Director for several new markups

The following table summarizes the changes made to V4 in developing V5.

Table 29 - Data Encoding Specification V5 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Use ISM V5	Schema	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rule.
2	Create Approximable dates.	Documentation Schema	Data generation and Ingestion systems need to be updated to use the new structures. Note: Data valid under previous releases may not be valid under this release.
3	Create Attachments.	Documentation Schema	Data generation and Ingestion systems need to be updated to use the new structures.
4	Create DateAcquired .	Documentation Schema	Data generation and Ingestion systems need to be updated to use the new structures.
5	Update MIME Types.	CVE	Data generation and Ingestion systems need to be updated to use the values. Note: Data valid under previous releases may not be valid under this release.
6	Update DateInfoCutoff to use Approximable dates.	Documentation Schema	Data generation and Ingestion systems need to be updated to use the values. Note: Data valid under previous releases may not be valid under this release.

#	Change	Artifacts changed	Compatibility Notes
7	Create support for CollectionSource .	Documentation Schema	Data generation and Ingestion systems need to be updated to use the new structures.
8	Coverage/Temporal modified to use an approximable date.	Schema	Data generation and Ingestion systems need to be updated to use the new structures.
9	Update DateInformation to use Approximable dates.	Documentation Schema	Data generation and Ingestion systems need to be updated to use the values. Note: Data valid under previous releases may not be valid under this release.
10	Remove Appendix H Reading the Schematics.	Documentation	Knowledge of how to interpret these schema images is common making this appendix unnecessary.
11	Add support for expressing coverage of NonState Actors.	Documentation Schema	Data generation and Ingestion systems need to be updated to properly support new elements.

B.14 - V4 Change Summary

Significant drivers for Version 4 include:

- See ISM.XML^[22] V4 drivers
- ASEC for Production Metrics
- CMSTT for new markup

The following table summarizes the changes made to V3 in developing V4.

Table 30 - Data Encoding Specification V4 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Change to use ISM V4.	Documentation PUBS-ID-00085	See ISM change notes for Impacts. Note: Data valid under previous releases will not be valid under this release.

#	Change	Artifacts changed	Compatibility Notes
2	Included irm:ProductionMetricsList .	Documentation Schema	As this is an additional required data element existing data will not be valid and systems will need to be modified to handle the data appropriately.
3	Eliminate National Intelligence Priorities Framework (NIPF.)	Documentation Schema PUBS-ID-00004	Data generation and Ingestion systems need to be updated to properly enforce the new constraint rules.
4	Refactor to single root element IntelDoc .	Documentation Schema PUBS-ID-00008	Data generation and Ingestion systems need to be updated to use the new structures.
5	Use schema to enforce DES version number.	Schema PUBS-ID-00077 PUBS-ID-00078 PUBS-ID-00083 PUBS-ID-00084	Data Ingestion systems need to be updated to use the new schema instead of constraint rules.
6	Implemented PublicationMetadataList to allow for multiple metadata descriptions of the document body.	Schema	Data generation and Ingestion systems need to be updated to use the new structures.
7	Implemented DocumentBody as a container for front and rear matter as well as the ComplexObject Group that contains the main document body.	Schema	Data generation and Ingestion systems need to be updated to use the new structures.
8	Removed Security Element from DescriptiveMetadata .	Schema	Data generation and Ingestion systems need to be updated to the root node as the Resource security element.
9	Applied Resource Security to root node IntelDoc .	Schema	Data generation and Ingestion systems need to be updated to the root node as the Resource security element.
10	Remove references to NIPF.	PUBS-ID-00003 PUBS-ID-00004	Data Ingestion systems need to be updated to reflect the rule changes.

#	Change	Artifacts changed	Compatibility Notes
11	Require classification of each PublicationMetatdata when there are multiple.	Documentation PUBS-ID-00086	Data generation and Ingestion systems need to be updated to use the new structures.
12	Add NoticeList .	Documentation Schema	Data generation and Ingestion systems need to be updated to use the new structures.
13	Replace Narcotic with Drug .	Schema	Data generation and Ingestion systems need to be updated to use the new structures.
14	Added irm:RecordKeeper to RecordsManagmentInfo .	Schema	As this is an additional required data element existing data will not be valid and systems will need to be modified to handle the data appropriately. Note: this element is only required if its parent, RecordsManagementInfo , is used. Data generation and Ingestion systems need to be updated to use the new structures.

B.15 - V3 Change Summary

Significant drivers for Version 3 include:

- See ISM.XML^[22] V3 drivers
- Executive Order 13526^[7]
- NTK.XML^[31] needs from Library of National Intelligence (LNI)
- ASEC for Production Metrics
- Controlled Access Program Coordination Office (CAPCO) Register and Manual^[2]

The following table summarizes the changes made to V2 in developing V3.

Table 31 - Data Encoding Specification V3 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Change to use ISM V3.	Documentation Constraint Rules	See ISM change notes for Impacts. Note: Data could have been created that was valid under previous releases that may not be valid under this release.
2	Update references to E.O. 12958, as amended ^[6] to refer to E.O. 13526 ^[7] .	Documentation	Should not impact data.
3	Added reference to NTK.XML.	Documentation PUBS-ID-00083	Existing data remain valid. Systems need to be modified to accept and process new data.
4	Included irm:ProductionMetricsList .	Documentation Schema	As this is an additional required data element existing data will not be valid and systems will need to be modified to handle the data appropriately.
5	Added constraint to ensure ism:notice is only used where allowed.	PUBS-ID-00082	Existing data remain valid. Systems need to be modified to accept and process new data.

B.16 - V2 Change Summary

Significant drivers for Version 2 include:

- See ISM.XML^[22] V2 drivers
- DNI Revision Recall Memo^[5]
- ICD 206^[11]
- DDMS^[4] Changes

The following table summarizes the changes made to V1 in developing V2.

Table 32 - Data Encoding Specification V2 Change Summary

#	Change	Artifacts changed	Compatibility Notes
1	Various changes to documentation.	Documentation Schema	Changes were to correct errors. Any system that relied on the incorrect information may need to be modified.

#	Change	Artifacts changed	Compatibility Notes
2	Removed version number from file names.	Schema	Data generation and ingestion systems need to be updated to use the new file names.
3	Added ability for instance documents to specify the DES version used for the document.	Schema Constraint Rules	Data generation systems need to be updated to use the new feature. Ingestion systems need to be updated to properly handle the new data.
4	Changed default namespace.	Schema	Data generation systems need to be updated to use the new namespace. Ingestion systems need to be updated to properly handle the new data.
5	Added support for Revision/Recall identification.	Schema Constraint Rules	Data generation systems should be updated to use the new structures if they need the feature. Ingestion systems need to use the new specification, including schema and constraints rules. Note: Data could have been created that was valid under previous releases that may not be valid under this release.
6	Updated reference to DDMS ^[4] to use version 2.0.	Schema	Data generation systems should be updated to use the new structures if they need the feature. Ingestion systems need to use the new specification, including schema. Note: Data could have been created that was valid under previous releases that may not be valid under this release.
7	Updated DES to support ICD 206 ^[11] source citations.	Schema Constraint Rules Controlled Value Enumerations	Data generation systems need to be updated to use the new feature. Ingestion systems need to be updated to properly handle the new data. Note: Data could have been created that was valid under previous releases that may not be valid under this release.

#	Change	Artifacts changed	Compatibility Notes
8	Relaxed XML schema for PersonalProfileGroup and replaced with constraint rules.	Schema Constraint Rules	Any system relying solely on the ISM.XML ^[22] schema for validation of PersonProfileGroup may need to be modified to ensure that data are processed appropriately.
9	Specified and/or update values for numerous elements and attribute to allow more specific validation of data.	Schema Constraint Rules Controlled Value Enumerations	All systems can now use the specified values to ensure data are correct. Note: Data could have been created that was valid under previous releases that may not be valid under this release.

Appendix C List of Abbreviations

This appendix lists all the acronyms and abbreviations referenced in this encoding specification.

ADD	Abstract Data Definition
CAPCO	Controlled Access Program Coordination Office
CMSTT	Common Metadata Standards Tiger Team
CVE	Controlled Vocabulary Enumeration
DDMS	Department of Defense Discovery Metadata Specification
DES	Data Encoding Specification
DNI	Director of National Intelligence
ESB	Enterprise Standards Baseline
FGI	Foreign Government Information
FIPS	Federal Information Processing Standards
FOUO	For Official Use Only
GUIDE	Globally Unique Identifiers for Everything
HUMINT	Human Intelligence
IANA	Internet Assigned Numbers Authority
IC	Intelligence Community
IC CIO	Intelligence Community Chief Information Officer
ICD	Intelligence Community Directive
IC ESB	Intelligence Community Enterprise Standards Baseline
ICPM	Intelligence Community Policy Memorandum
ICS	Intelligence Community Standard
IEC	International Electrotechnical Commission
INTDIS	Intelligence Discipline
IRM	Information Resource Metadata
ISM	Information Security Markings
ISO	International Organization for Standardization

LNI	Library of National Intelligence
MIME	Media Type
NIPF	National Intelligence Priorities Framework
NIEM	National Information Exchange Model
NTK	Need-To-Know Metadata
ODNI	Office of the Director of National Intelligence
PAYL	Payload
PUBS	Intelligence Publications
SRC	Source Reference Citation
TDF	Trusted Data Format
TDO	Trusted Data Object
URL	Uniform Resource Locator
VIRT	Virtual Coverage
W3C	World Wide Web Consortium
XHTML	eXtensible Hyper-Text Markup Language
XLink	XML Linking
XML	Extensible Markup Language
XSL	Extensible Stylesheet Language
XSLT	XSL Transformations

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Appendix E Points of Contact

The Intelligence Community Chief Information Officer (IC CIO) facilitates one or more collaboration and coordination forums charged with the adoption, modification, development, and governance of IC technical specifications of common concern. This technical specification was produced by the IC CIO and coordinated with these forums, approved by the IC CIO or a designated representative, and made available at the following DNI-sponsored web sites.

Public Website: <https://w3id.org/ic/standards/public>

Intelshare: <https://w3id.org/ic/standards/data-specs>

Direct all inquiries about this IC technical specification, IC technical specification collaboration and coordination forums, or IC element representatives involved in those forums, to the IC CIO.

E-mail: ic-standards-support@odni.gov.

Appendix F IC CIO Approval Memo

An IC CIO Approval Memo should accompany this enterprise technical data specification bearing the signature of the IC CIO or an IC CIO-designated official(s). If an IC CIO Approval Memo is not accompanying this specification's version release package, then refer back to the authoritative web location(s) for this specification to see if a more complete package or a specification update is available.

Specification artifacts display a date representing the last time a version's artifacts as a whole were modified. This date most often represents the conclusion of the IC Element collaboration and coordination process. Once the IC Element coordination process is complete, the specification goes through an internal IC CIO staffing and coordination process leading to signature of the IC CIO Approval Memo. The signature date of the IC CIO Approval Memo will be later than the last modified date shown on the specification artifacts by an indeterminable time period.

Upon signature of the IC CIO Approval Memo, IC Elements may begin to use this specification version in order to address mission and business objectives. However, it is critical for IC Elements, prior to disseminating information encoded with this new specification version, to ensure that key enterprise services and consumers are prepared to accept this information. IC Elements should work with enterprise service providers and consumers to orchestrate an orderly implementation transition to this specification version in concert with mandatory and retirement usage decisions captured in the Intelligence Community Enterprise Standards Baseline (IC ESB) as defined in ICS 500-20^[18].