THE MITRE CORPORATION

The TAXII XML Message Binding Specification

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The Trusted Automated eXchange of Indicator Information (TAXII™) specifies mechanisms for exchanging structured cyber threat information between parties over the network. This document describes how to express TAXII messages using an XML binding.

Trademark Information

Feedback

Feedback on this or any of the other TAXII specifications is welcome and can be sent to taxii-discussion-list@lists.mitre.org after signing up on the community registration page (http://taxii.mitre.org/community/registration.html). You may also provide feedback directly to MITRE by sending a message to taxii@mitre.org.

Comments, questions, suggestions, and concerns are all appreciated.

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1 Introduction

This document describes how to express TAXII Messages using XML [1] syntax. The use of these messages to support TAXII Services is described separately in the TAXII Services Specification [2]. It is recommended that the reader familiarize themself with the TAXII Services Specification prior to reading this document.

1.1 The TAXII XML Message Binding Specification

This specification provides normative text on the expression of TAXII Messages using XML syntax. It does not provide details about how TAXII Messages are transported, leaving that to a Protocol Binding Specification. The TAXII Services and TAXII Message Exchanges that these Messages support, as well as a detailed discussion of the meaning of message fields, are discussed in detail in the TAXII Services specification.

1.1.1 TAXII Message Binding Version ID for XML

The TAXII Message Binding Version ID for the version of the XML Binding described in this specification is:

`urn:taxii.mitre.org:message:xml:1.1`

1.1.2 The TAXII XML Schema

This document is accompanied by an XML schema as a means to clarify the requirements surrounding TAXII XML Message structures. The schema is provided as an aid to developers and implementers but is not normative. If there is ever disagreement between the specification and the schema the specification is considered correct. In particular, due to the limitations of XML schemas, the schema permits some structures that are prohibited by the specification.

An XML schema is provided for each major and minor release of this specification. The full version of this specification associated with a given schema is reflected in the version attribute in the top-level `<schema>` element of the schema file and in the XML namespace. The XML namespace for the XML schema associated with this specification is:

`"http://taxii.mitre.org/messages/taxii_xml_binding-1.1"`

1.2 Document Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this specification are to be interpreted as described in IETF RFC 2119. [3]

When making references to XML elements and attributes as well as other XML literals (such as enumerated values), this document uses `Courier New Font`. XML element names are denoted by non-namespaced text surrounded by angle brackets (e.g., `<TAXII_Discovery_Request>`) while attribute names are preceded by an "at" symbol (e.g., `@message_id`).

1.3 Terms and Definitions

This document uses the Terms and Definitions defined in the TAXII Services Specification and TAXII Overview [4]. In addition, this document defines terms that are assigned a specific meaning within this specification.

1.3.1 XML Binding Terms

The TAXII Services Specification identifies a number of fields for each TAXII Message Type. This specification specifies those fields as XML structures. The Services Specification discusses fields in terms of general concepts they are meant to convey, while this specification represents fields as precise character patterns to represent information. When the distinction between these two uses of "field" is important, this document uses the following terms:

Data Model Field - A field defined in the TAXII Message data model that appears in the TAXII Services Specification. For example, all messages have a "Message ID" Data Model Field that contains a message identifier.

XML Field - A field expressed using the XML syntax defined in this specification. XML Fields correspond to either an XML element or an XML attribute. For example, all messages have a "`@message_id`" XML Field that contains a value identifying the message using the XML string type.

Note that there is not always a one-to-one mapping between a Data Model Field and an XML Field. Such situations are noted where they occur.

2 TAXII XML Message Binding Overview

This section considers some of the underlying concepts behind the TAXII XML Message Binding. It considers the overall structure of a TAXII Message in this binding and also considers the meanings of certain Data Model Field values and the details of their expression using XML Field values.

2.1 TAXII XML Message Binding Structure

The TAXII XML Message Binding defines requirements regarding the overall structuring of TAXII Messages using XML. These requirements are described in the following subsections.

2.1.1 Messages are Root Elements

A separate XML element is defined to represent each type of TAXII Message. Each element that represents a TAXII Message can appear as a root element in an XML document. In XML schema parlance, this means all TAXII Message elements are global elements. Moreover, this specification does not define any elements that contain TAXII Message elements. As such, within this TAXII Message Binding, TAXII Message elements do not appear as descendants of other elements.

One side effect of this is that this specification does not define any way to include multiple TAXII Messages within a single XML document. This reflects that, in TAXII Message Exchanges, there is no situation where multiple TAXII Messages can be sent in a single transmission.

2.1.2 No Header and Body Field Distinction

All TAXII Messages consist of a header and a body. TAXII Header fields represent information that is applicable to all TAXII Message Body Types, while TAXII Body fields contain information that is specific to a particular TAXII Message Body Type. This specification does not distinguish between TAXII Header fields and TAXII Body fields. In other words, there is not a dedicated region containing all TAXII Header content with a separate region containing all TAXII body content. Instead, both types of fields exist as peers in the XML of a TAXII Message. This document does not treat the header and body fields separately or otherwise differentiate between them.

2.1.3 Strict Ordering of Elements

In this specification, all XML Fields that use XML elements use a strict ordering of fields. (In XML schema parlance, elements are defined in a sequence.) This allows parsers to quickly locate specific fields and to know how many times a given field appears without needing to parse the entire document.

XML attributes can appear in any order within their parent XML element.

2.1.4 Message Schema Validation

Neither senders nor recipients are required to perform schema validations on messages that they send or receive, respectively. Senders of messages that use this message binding are required to conform to the requirements of this specification regardless of the use of schema validation. If a message recipient detects an incorrectly formatted message, either through schema validation or other means, the recipient SHOULD respond with a Status Message with a Status Type of "Bad Message".

2.1.5 Version, Binding, and Format IDs

Note that, in terms of processing, the TAXII XML Message Binding Specification does not distinguish between Version IDs, Query Format IDs, and Content Binding IDs that are defined by TAXII specifications and those defined by third parties. Use of the terms TAXII Protocol Version ID, TAXII Message Version ID, Query Format ID, and Content Binding ID are used throughout this document without regard to the source of that ID.

2.2 Special Field Values

Several TAXII Message fields appear in multiple TAXII Messages and have a specialized structure and/or important meaning. This section looks at these fields, identifies the requirements that govern their values, and explains how they are represented in XML.

2.2.1 Timestamp Labels

In TAXII, each piece of content within a TAXII Data Feed is assigned a unique Timestamp Label value. (Timestamp Labels are not applicable to content within a TAXII Data Set.) Timestamp Labels are used to allow Consumers to indicate which parts of a TAXII Data Feed they are requesting in a Poll Request Message. While a Timestamp Label is in the form of a timestamp, it is important to note that Timestamp Labels do not necessarily correspond to any chronological event nor do they necessarily align with timestamps that appear within the content of a TAXII Data Feed. The Timestamp Label is just a label, rather than a reference to some meaningful chronological time.

The TAXII XML Message Binding requires XML Fields that contain Timestamp Labels to be XML dateTime values. In addition, these values MUST conform to the following rules:

- They MUST include a time zone component (i.e., either "Z" or a numerical offset), in accordance with the date-time production in RFC 3339 [5].
- They MUST NOT contain fractional seconds with more than six decimal places of precision.

See section 4.1.4 in the TAXII Services Specification for details about how Timestamp Labels are to be assigned to Data Feed content and their use within a TAXII Architecture.

2.2.2 Extended Headers and Status Details

TAXII allows the specification of Extended Headers in all TAXII Messages. All Extended Headers are defined by third parties outside the TAXII specifications. Extended Headers in TAXII are represented as name-value pairs.

Similarly, Status Messages may include a Status Detail field to contain machine-processable information about a Status Message (usually representing some kind of error). The content of a Status Detail field consists of name-value pairs.

In the TAXII XML Message Binding, each Extended Header or Status Detail field is expressed as a sub-element (`<Extended_Header>` and `<Detail>`, respectively) of a single outer element (`<Extended_Headers>` and `<Status_Details>`, respectively). Each Extended Header and Status Detail name conforms to URI formatting [6] and appears in the `@name` attribute of their respective sub-elements. Values of an Extended Header or Status Detail can be any content, including other XML elements, and appear in the body of their respective sub-elements. In this binding, the value undergoes lax processing - if the provider of the third party value includes XML elements that conform to some other XML schema then XML validation can check for schema conformance but lack of a schema does not cause validation to fail.

2.2.3 Names and Identifiers

TAXII utilizes several classes of identifiers that are intended to be globally unique. These include:

- Extended Header names
- Status Detail subfield names
- Query Format IDs
- Content Binding IDs
- Content Binding Subtype IDs
- Protocol Binding Version IDs
- Message Binding Version IDs
- TAXII Services Version IDs

All of these names and identifiers MUST conform to URI formatting rules. In the TAXII XML Message Binding, all of these fields have an XML type of AnyURI.

Of these identifiers, all but the TAXII Services Version IDs may be used by third parties to identify custom extensions to TAXII. When a third party creates an identifier, the corresponding URI MUST include an authority component (usually in the form of a domain name) to indicate the entity responsible for this name or identifier. This is done in order to avoid accidental collisions between identifiers created by different parties. For more about these identifiers and their use, see Sections 4.1.5, 4.1.6, and 4.1.7 of the TAXII Services Specification.

Names and identifiers that do not need to be globally unique (i.e., TAXII Data Collection names, Subscription IDs, Result IDs, and Message IDs) also MUST conform to URI formatting requirements and thus fields that contain these values have an XML type of AnyURI. However, there is no corresponding requirement to include an authority component in these URI values. Instead, the entity assigning these identifiers is responsible for avoiding collisions only within the values it is responsible for creating. For more on avoiding collisions using Message IDs, Data Collection Names, and Subscription and Result IDs, see Sections 4.1.1, 4.1.2, and 4.1.3, respectively, of the TAXII Services Specification.

3 TAXII XML Messages

This section defines the XML structures used to express TAXII Messages as defined in Section 4 of the TAXII Services Specification. Each TAXII Message type is described below using tables that contain each Message Type's fields. XML elements can have child attributes or elements. Parent-child relationships are reflected in the tables below by indenting the attributes and child elements relative to their parent. XML elements in TAXII Messages MUST appear in the order in which they appear in these tables. XML attributes can appear in TAXII Messages in any order within their parent element.

For each XML Field, the following information is provided:

- XML Name - The element name or attribute name of an XML Field. If the XML Field is an element it appears between angle brackets (<>) and if it is an attribute it appears preceded by an "at" sign (@).
- Data Model Name - The name of the Data Model Field as provided in the TAXII Message data model in the TAXII Services Specification. Note that if multiple XML Fields are needed to convey the meaning in a single Data Model Field, all of these XML Fields would be assigned the same Data Model Name value.
- # - The number of times the XML Field can appear within a parent element, expressed either as a single digit or a range. If a field is optional, it is always expressed as a range with a lower bound of '0'. If a field can appear an unlimited number of times, it is always expressed as a range with an upper bound of 'n'. Note also that a required field that is a child of an optional field would be present if and only if its parent field was present.
- Value - Constraints on the permissible values of this XML Field. This would include the XML data type and other requirements.

The following sections define XML structures for all defined TAXII Message.

3.1 TAXII Status Message

Table 1 - TAXII Status Message Fields

XML Name	Data Model Name	#	Value
<Status_Message>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
@in_response_to	In Response To	1	An XML AnyURI equal to the value of the @message_id field to which this message is a response
@status_type	Status Type	1	An XML AnyURI; either one of the values provided in Table 2 or a third party defined value.
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.
<Status_Detail>	Status Detail	0-1	This field's body consists only of the indicated XML Fields. For some @status_type values the <Status_Detail> field MUST be present. These cases are noted in Table 2.
<Detail>	Status Detail	1-n	The body of this element supports mixed content and MAY contain any XML as described in Section 2.2.2. For some @status_type values one or more <Detail> fields MUST be present. These cases are noted in Table 2.
@name	Status Detail	1	An XML AnyURI containing the name of this Status Detail item. This name may come from Table 2 or be a third-party defined value.
<Message>	Message	0-1	An XML string.
<ds:Signature>	Signature	0-1	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

The list of standard @status_type values defined in this message binding appears in Table 2. In addition, Some @status_type values have defined <Status_Detail> name-value pairs. Table 2 indicates the names of any such <Status_Detail> name-value pairs and whether the given name-value pair is required for the given @status_type. If a particular name-value pair is required, the <Status_Detail> field is also required for that @status_type value. Name-value pairs that are

not required for particular `@status_type` values are still recommended and SHOULD be present if possible.

Table 2 - Defined Status Types

@status_type Value	Error Status Type	<Status_Detail> name-values	
		Name	Reqd?
ASYNCHRONOUS_POLL_ERROR	Asynchronous Poll Error		
BAD_MESSAGE	Bad Message		
DENIED	Denied		
DESTINATION_COLLECTION_ERROR	Destination Collection Error	ACCEPTABLE_DESTINATION	No
FAILURE	Failure		
INVALID_RESPONSE_PART	Invalid Response Part	MAX_PART_NUMBER	Yes
NETWORK_ERROR	Network Error		
NOT_FOUND	Not Found	ITEM	No
PENDING	Pending	ESTIMATED_WAIT	Yes
		RESULT_ID	Yes
		WILL_PUSH	Yes
POLLING_UNSUPPORTED	Polling Not Supported		
RETRY	Retry	ESTIMATED_WAIT	No
SUCCESS	Success		
UNAUTHORIZED	Unauthorized		
UNSUPPORTED_MESSAGE	Unsupported Message Binding	SUPPORTED_BINDING	No
UNSUPPORTED_CONTENT	Unsupported Content Binding	SUPPORTED_CONTENT	No
UNSUPPORTED_PROTOCOL	Unsupported Protocol Binding	SUPPORTED_PROTOCOL	No
UNSUPPORTED_QUERY	Unsupported Query Format	SUPPORTED_QUERY	No

Table 3 describes the value of the `<Detail>` field for the indicated `<Status_Detail>` named subfield.

Table 3 - Defined <Status_Detail>/<Detail> Names and Values

@status_type Value	<Detail> @name	<Detail> Value
DESTINATION_COLLECTION_ERROR	ACCEPTABLE_DESTINATION	An XML AnyURI indicating a permitted Collection Name. This field may be repeated.
INVALID_RESPONSE_PART	MAX_PART_NUMBER	An XML integer.
NOT_FOUND	ITEM	An XML AnyURI indicating the target that could not be located.
PENDING	ESTIMATED_WAIT	An XML integer indicating the number of seconds until the result set is expected to be available.
PENDING	RESULT_ID	An XML AnyURI indicating the Result ID.
PENDING	WILL_PUSH	An XML boolean indicating whether the results will be pushed.
RETRY	ESTIMATED_WAIT	An XML integer indicating the number of seconds before a retry should be attempted.
UNSUPPORTED_MESSAGE	SUPPORTED_BINDING	An XML AnyURI indicating a supported Message Binding. This field may occur any number of times.
UNSUPPORTED_CONTENT	SUPPORTED_CONTENT	An XML AnyURI indicating a supported Content Binding. This field may occur any number of times.
UNSUPPORTED_PROTOCOL	SUPPORTED_PROTOCOL	An XML AnyURI indicating a supported Protocol Binding. This field may occur any number of times.
UNSUPPORTED_QUERY	SUPPORTED_QUERY	An XML AnyURI indicating a supported Query Format. This field may occur any number of times.

3.2 TAXII Discovery Request

Table 4 - TAXII Discovery Request Fields

XML Name	Data Model Name	#	Value
<Discovery_Request>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.

XML Name	Data Model Name	#	Value
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.
<ds:Signature>	Signature	0-1	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

3.3 TAXII Discovery Response

Table 5 - TAXII Discovery Response Fields

XML Name	Data Model Name	#	Value
<Discovery_Response>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
@in_response_to	In Response To	1	An XML AnyURI equal to the value of the @message_id field to which this message is a response
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.
<Service_Instance>	Service Instance	0-n	This field's body consists only of the indicated XML Fields. This element MAY appear any number of times with each instance corresponding to a single reported TAXII Service instance.
@service_type	Service Type	1	This field MUST contain one of the values given in Table 6.
@service_version	Services Version	1	An XML AnyURI containing a TAXII Services Version ID.

XML Name	Data Model Name	#	Value
@available	Available	0-1	An XML boolean. If true the requester is allowed access to this service. If false, the requester is not allowed access to this service. If absent, treat access as unknown.
<Protocol_Binding>	Protocol Binding	1	An XML AnyURI containing a TAXII Protocol Binding Version ID.
<Address>	Service Address	1	An XML string representing a network address.
<Message_Binding>	Message Binding	1-n	An XML AnyURI containing a TAXII Message Binding Version ID. This field MUST appear one or more times with each instance indicating a different supported binding.
<Supported_Query>	Supported Query	0-n	The body of this element supports mixed content and MAY contain any XML. The body of this element MUST adhere to the Supported Query subfields defined in the Query Format Specification identified by the @format_id field.
@format_id	Query Format ID	1	An XML AnyURI indicating a Query Format ID.
<Content_Binding>	Inbox Service Accepted Content	0-n	This field's body consists only of the indicated XML Fields. If the value of @service_type is something other than INBOX, this field SHOULD NOT be included by the sender and MUST be ignored by the message recipient. If the value of @service_type is INBOX each instance of this field indicates a different supported binding. If the value of @service_type is INBOX but there are no instances of this field, the identified Inbox Service accepts all content bindings.
@binding_id	Inbox Service Accepted Content	1	An XML AnyURI containing a supported Content Binding ID.
<Subtype>	Subtype	0-n	This element has no body. Each instance of this field indicates a supported subtype of the indicated Content Binding. If no instances of this element are present, all subtypes of the identified Content Binding are supported.
@subtype_id	Subtype	1	An XML AnyURI containing a Content Binding Subtype ID.
<Message>	Message	0-1	An XML string.

XML Name	Data Model Name	#	Value
<ds:Signature>	Signature	0-1	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

The @service_type field identifies the type of service reported in the given <Service_Instance>. Its value MUST be one of the values provided in Table 6.

Table 6 - Service Types

Service	@service_type Value
Discovery Service	DISCOVERY
Collection Management Service	COLLECTION_MANAGEMENT
Inbox Service	INBOX
Poll Service	POLL

3.4 TAXII Collection Information Request

Table 7 - TAXII Collection Information Request Fields

XML Name	Data Model Name	#	Value
<Collection_Information_Request>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.
<ds:Signature>	Signature	0-1	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

3.5 TAXII Collection Information Response

Table 8 - TAXII Collection Information Response Fields

XML Name	Data Model Name	#	Value
<Collection_Information_Response>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
@in_response_to	In Response To	1	An XML AnyURI equal to the value of the @message_id field to which this message is a response
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.
<Collection>	Collection Information	0-n	This field's body consists only of the indicated XML Fields. Appears once for each TAXII Data Collection reported in this message.
@collection_name	Collection Name	1	An XML anyURI containing the Collection Name for this TAXII Data Collection.
@collection_type	Collection Type	0-1	This field has a value of either "DATA_FEED" or "DATA_SET". The default value of this field is "DATA_FEED".
@available	Available	0-1	An XML boolean. If true the requester is allowed access to this Data Collection. If false, the requester is not allowed access to this Data Collection. If absent, treat access as unknown.
<Description>	Collection Description	1	An XML string.
<Collection_Volume>	Collection Volume	0-1	An XML nonNegativeInteger.
<Content_Binding>	Supported Content	0-n	This field's body consists only of the indicated XML Fields. Each instance of this field indicates a supported Content Binding for this TAXII Data Collection. If there are no instances of this field, the Data Collection may use any Content Binding.

XML Name	Data Model Name	#	Value
@binding_id	Supported Content	1	An XML AnyURI containing a supported Content Binding ID.
<Subtype>	Subtype	0-n	This element has no body. Each instance of this field indicates a supported subtype of the indicated Content Binding. If no instances of this field are present, all subtypes of the identified Content Binding are supported.
@subtype_id	Subtype	1	An XML AnyURI containing a Content Binding Subtype ID.
<Push_Method>	Push Method	0-n	This field's body consists only of the indicated XML Fields. Each instance of this field indicates one set of bindings that can be used to push content to a Consumer's Inbox Service.
<Protocol_Binding>	Push Protocol	1	An XML AnyURI containing a TAXII Protocol Binding Version ID.
<Message_Binding>	Push Message Binding	1-n	An XML AnyURI containing a TAXII Message Binding Version ID. This field MUST appear one or more times with each instance indicating a different supported binding.
<Polling_Service>	Polling Service Instance	0-n	This field's body consists only of the indicated XML Fields. Each instance of this field indicates one Poll Service instance that can be used to poll for content from this Data Collection.
<Protocol_Binding>	Poll Protocol	1	An XML AnyURI containing a TAXII Protocol Binding Version ID.
<Address>	Poll Address	1	An XML string representing a network address.
<Message_Binding>	Poll Message Binding	1-n	An XML AnyURI containing a TAXII Message Binding Version ID. This field MUST appear one or more times with each instance indicating a different supported binding.
<Subscription_Service>	Subscription Method	0-n	This field's body consists only of the indicated XML Fields. Each instance of this field indicates one Collection Management Service that can be used to establish a subscription to this Data Collection. If no instances of this field are present, subscriptions cannot be established using TAXII messages.

XML Name	Data Model Name	#	Value
<Protocol_Binding>	Subscription Protocol	1	An XML AnyURI containing a TAXII Protocol Binding Version ID.
<Address>	Subscription Address	1	An XML string representing a network address.
<Message_Binding>	Subscription Message Binding	1-n	An XML AnyURI containing a TAXII Message Binding Version ID. This field MUST appear one or more times with each instance indicating a different supported binding.
<Receiving_Inbox_Service>	Receiving Inbox Service	0-n	This field's body consists only of the indicated XML Fields. Each instance of this field indicates on Inbox Service by which records can be pushed to this Data Collection.
<Protocol_Binding>	Inbox Protocol	1	An XML AnyURI containing a TAXII Protocol Binding Version ID.
<Address>	Inbox Address	1	An XML string representing a network address.
<Message_Binding>	Inbox Message Binding	1-n	An XML AnyURI containing a TAXII Message Binding Version ID. This field MUST appear one or more times with each instance indicating a different supported binding.
<Content_Binding>	Supported Content	0-n	This field's body consists only of the indicated XML Fields. Each instance of this field indicates a Content Binding accepted by this Inbox Service. If there are no instances of this field, the Inbox Service accepts any Content Binding.
@binding_id	Supported Content	1	An XML AnyURI containing a supported Content Binding ID.
<Subtype>	Subtype	0-n	This element has no body. Each instance of this field indicates a supported subtype of the indicated Content Binding. If no instances of this field are present, , all subtypes of the identified Content Binding are supported.
@subtype_id	Subtype		An XML AnyURI containing a Content Binding Subtype ID.
<ds:Signature>	Signature	0-1	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

3.6 TAXII Manage Collection Subscription Request

Table 9 - TAXII Collection Information Request Fields

XML Name	Data Model Name	#	Value
<Subscription_Management_Request>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.
@action	Action	1	This field MUST contain one of the values given in Table 10.
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
@collection_name	Collection Name	1	An XML AnyURI containing the Collection Name for the TAXII Data Collection.
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.
<Subscription_ID>	Subscription ID	0-1	An XML AnyURI containing a Subscription ID value. This field MUST be present if @action="UNSUBSCRIBE", @action="PAUSE", or @action="RESUME". This field SHOULD NOT be present if @action="SUBSCRIBE" and MUST be ignored by the recipient in this case. This field MAY be present if @action="STATUS".
<Subscription_Parameters>	Subscription Parameters	0-1	This field's body consists only of the indicated XML Fields. This field is present if and only if @action="SUBSCRIBE".
<Response_Type>	Response Type	0-1	This field has a value of either "FULL" or "COUNT_ONLY". The default value of this field is "FULL".
<Content_Binding>	Content Binding	0-n	This field's body consists only of the indicated XML Fields. Each instance of this field indicates a Content Binding accepted by the Consumer for this subscription. If there are no instances of this field, the Consumer accepts all Content Bindings.
@binding_id	Content Binding	1	An XML AnyURI containing a supported Content Binding ID.

XML Name	Data Model Name	#	Value
<Subtype>	Subtype	0-n	This element has no body. Each instance of this field indicates a supported subtype of the indicated Content Binding. If no instances of this field are present present, all subtypes of the identified Content Binding are supported.
@subtype_id	Subtype	1	An XML AnyURI containing a Content Binding Subtype ID.
<Query>	Query	0-1	The body of this element supports mixed content and MAY contain any XML. The body of this element MUST adhere to the Query Format indicated by the Query Format Specification indicated by the @format_id subfield.
@format_id	Query Format	1	An XML AnyURI indicating a Query Format ID.
<Push_Parameters>	Delivery Parameters	0-1	The body of this element, if present, consists only of the indicated XML Fields. For values of @action other than SUBSCRIBE senders SHOULD NOT include this field and recipients MUST ignore this field. If @action="SUBSCRIBE" and this field is absent then the sender is indicating that it does not want content pushed to an Inbox service. (I.e., the sender will poll for content.)
<Protocol_Binding>	Inbox Protocol	1	An XML AnyURI containing a TAXII Protocol Binding Version ID.
<Address>	Inbox Address	1	An XML string representing a network address.
<Message_Binding>	Delivery Message Binding	1	An XML AnyURI containing a TAXII Message Binding Version ID.
<ds:Signature>	Signature	0-1	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

The @action field contains a value indicating what subscription management action is to be taken. Possible values for this field appear in Table 10.

Table 10 - Collection Management Actions

@action Value	Management Action
SUBSCRIBE	SUBSCRIBE - Request a subscription to the named TAXII Data Collection
UNSUBSCRIBE	UNSUBSCRIBE - Request cancellation of an existing subscription to the named TAXII Data Collection
PAUSE	PAUSE - Suspend delivery of content for the identified subscription
RESUME	RESUME – Resume delivery of content for the identified subscription
STATUS	STATUS - Request information on all subscriptions the requester has established for the named TAXII Data Collection.

3.7 TAXII Manage Collection Subscription Response

Table 11 - TAXII Collection Information Response Fields

XML Name	Data Model Name	#	Value
<Subscription_Management_Response>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
@in_response_to	In Response To	1	An XML AnyURI equal to the value of the @message_id field to which this message is a response
@collection_name	Collection Name	1	An XML AnyURI containing the Collection Name for the TAXII Data Collection.
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.
<Message>	Message	0-1	An XML string.
<Subscription>	Subscription Instance	0-n	This field's body consists only of the indicated XML Fields. Each instance reports a different subscription to the named Data Collection. This field MUST appear exactly once for @action values other than STATUS. This field may appear any number of times when @action="STATUS".
@status	Status	0-1	One of "ACTIVE", "PAUSED", or "UNSUBSCRIBED". The default value of this field is "ACTIVE".
<Subscription_ID>	Subscription ID	1	An XML AnyURI containing a Subscription ID value.

XML Name	Data Model Name	#	Value
<Subscription_Parameters>	Subscription Parameters	0-1	This field's body consists only of the indicated XML Fields. This field and its sub fields duplicate the <Subscription_Parameters> structure in the Manage Collection Subscription Request message that established the identified subscription.
<Response_Type>	Response Type	0-1	This field has a value of either "FULL" or "COUNT_ONLY". The default value of this field is "FULL".
<Content_Binding>	Content Binding	0-n	This field's body consists only of the indicated XML Fields.
@binding_id	Content Binding	1	An XML AnyURI containing a supported Content Binding ID.
<Subtype>	Subtype	0-n	This field's body consists only of the indicated XML Fields.
@subtype_id	Subtype	1	An XML AnyURI containing a Content Binding Subtype ID.
<Query>	Query	0-1	The body of this element supports mixed content and MAY contain any XML.
@format_id	Query Format	1	An XML AnyURI indicating a Query Format ID.
<Push_Parameters>	Delivery Parameters	0-1	This field's body consists only of the indicated XML Fields. This field is present if and only if the Producer intends to fulfill the subscription by pushing content to the subscriber. If present, this field and its subfields duplicate the <Push_Parameters> structure in the Manage Collection Subscription Request message that established the identified subscription.
<Protocol_Binding>	Inbox Protocol	1	An XML AnyURI containing a TAXII Protocol Binding Version ID.
<Address>	Inbox Address	1	An XML string representing a network address.
<Message_Binding>	Delivery Message Binding	1	An XML AnyURI containing a TAXII Message Binding Version ID.
<Poll_Instance>	Poll Instance	0-n	This field's body consists only of the indicated XML Fields. Each instance of this field identifies a Poll Service that can be used to poll for subscription content. If this field is absent, polling for subscription content is not supported.

XML Name	Data Model Name	#	Value
<Protocol_Binding>	Poll Protocol	1	An XML AnyURI containing a TAXII Protocol Binding Version ID.
<Address>	Poll Address	1	An XML string representing a network address.
<Message_Binding>	Poll Message Binding	1-n	An XML AnyURI containing a TAXII Message Binding Version ID.
<ds:Signature>	Signature	0-1	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

3.8 TAXII Poll Request

Table 12 - TAXII Poll Request Fields

XML Name	Data Model Name	#	Value
<Poll_Request>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
@collection_name	Collection Name	1	An XML AnyURI containing the Collection Name for the TAXII Data Collection.
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.
<Exclusive_Begin_Timestamp>	Exclusive Begin Timestamp Label	0-1	An XML dateTime value containing a Timestamp Label. The absence of this field indicates either that there is no lower bound or that the Poll Request is directed at a Data Set.
<Inclusive_End_Timestamp>	Inclusive End Timestamp Label	0-1	An XML dateTime value containing a Timestamp Label. The absence of this field indicates either that there is no upper bound or that the Poll Request is directed at a Data Set.

XML Name	Data Model Name	#	Value
<Subscription_ID>	Subscription ID	1	An XML AnyURI containing a Subscription ID. This field is present if and only if there is no <Poll_Parameters> field present.
<Poll_Parameters>	Poll Parameters		This field's body consists only of the indicated XML Fields. This field is present if and only if there is no <Subscription_ID> field present.
@allow_asynch	Allow Asynch	0-1	An XML boolean. If true, the polling party supports Asynchronous Polling. If false, Asynchronous Polling is not supported. The default value of this field is false.
<Response_Type>	Response Type	0-1	This field has a value of either "FULL" or "COUNT_ONLY". The default value of this field is "FULL".
<Content_Binding>	Content Binding	0-n	This field's body consists only of the indicated XML Fields. Each instance of this field indicates an acceptable Content Binding for content in the Poll Response message. If there are no instances of this field, this indicates that all Content Bindings are acceptable.
@binding_id	Content Binding	1	An XML AnyURI containing a supported Content Binding ID.
<Subtype>	Subtype	0-n	This element has no body. Each instance of this field indicates a supported subtype of the indicated Content Binding. If no instances of this field are present, all subtypes of the identified Content Binding are supported.
@subtype_id	Subtype	1	An XML AnyURI containing a Content Binding Subtype ID.
<Query>	Query	0-1	The body of this element supports mixed content and MAY contain any XML. The body of this element MUST adhere to the Query Format indicated by the Query Format Specification indicated by the @format_id subfield.
@format_id	Query Format	1	An XML AnyURI indicating a Query Format ID.

XML Name	Data Model Name	#	Value
<Delivery_Parameters>	Delivery Parameters	0-1	The body of this element, if present, consists only of the indicated XML Fields. If this field is present, it identifies an Inbox Service to which Asynchronous Poll results may be pushed.
<Protocol_Binding>	Inbox Protocol	1	An XML AnyURI containing a TAXII Protocol Binding Version ID.
<Address>	Inbox Address	1	An XML string representing a network address.
<Message_Binding>	Delivery Message Binding	1	An XML AnyURI containing a TAXII Message Binding Version ID.
<ds:Signature>	Signature	0-1	This element is defined in th XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

Note that if both <Exclusive_Begin_Timestamp> and <Inclusive_End_Timestamp> are present in this message, the value in <Inclusive_End_Timestamp> MUST be greater than the value in <Exclusive_Begin_Timestamp>.

3.9 TAXII Poll Response

Table 13 - TAXII Poll Request Fields

XML Name	Data Model Name	#	Value
<Poll_Response>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
@in_response_to	In Response To	1	An XML AnyURI equal to the value of the @message_id field to which this message is a response
@collection_name	Collection Name	1	An XML AnyURI containing the Collection Name for the TAXII Data Collection.
@more	More	0-1	An XML boolean value. The default value of this field is false.
@result_id	Result ID	0-1	An XML AnyURI containing a Result ID. This field MUST be present of @more="true".
@result_part_number	Result Part Number	0-1	An XML positiveInteger. The default value of this field is 1.

XML Name	Data Model Name	#	Value
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.
<Subscription_ID>	Subscription ID	0-1	An XML AnyURI containing a Subscription ID.
<Exclusive_Begin_Timestamp>	Exclusive Begin Timestamp Label	0-1	An XML dateTime value containing a Timestamp Label. This field MUST NOT be present if the named Data Collection is a Data Set. Otherwise, absence of this field indicates that the response covers the earliest content within the Data Feed.
	Inclusive Begin Timestamp Label		*This Data Model Field is not supported in the current version of the XML Message Binding.*
<Inclusive_End_Timestamp>	Inclusive End Timestamp Label	0-1	An XML dateTime value containing a Timestamp Label. This field MUST be present if the named Data Collection is a Data Feed. It MUST NOT be present if the named Data Collection is a Data Set.
<Record_Count>	Record Count	0-1	An XML nonNegativeInteger.
@partial_count	Partial Count	0-1	An XML boolean. The default value of this field is false.
<Message>	Message	0-1	An XML string.
<Content_Block>	Content Block	0-n	This field's body consists only of the indicated XML Fields.
<Content_Binding>	Content Binding	1	This field's body consists only of the indicated XML Fields.
@binding_id	Content Binding	1	An XML string containing a Content Binding ID or a content nesting expression (as described in the TAXII Services Specification).

XML Name	Data Model Name	#	Value
<Subtype>	Subtype	0-1	This element has no body. If present, this field identifies a specific subtype of the named Content Binding to which the contained content conforms. Absence of this field means that no assertion about subtype conformance is made.
@subtype_id	Subtype	1	An XML AnyURI containing a Content Binding Subtype ID.
<Content>	Content	1	The body of this element supports mixed content and MAY contain any XML.
<Timestamp_Label>	Timestamp Label	0-1	An XML dateTime value containing a Timestamp Label.
<Message>	Message	0-1	An XML string.
<Padding>	Padding	0-1	An XML string.
<ds:Signature>	Signature	0-n	This element is defined in the XML Signature Syntax and Processing specification [7]. This signature is scoped to the <Content_Block> element in which it resides.
<ds:Signature>	Signature	0-1	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

3.10 TAXII Inbox Message

Table 14 - TAXII Inbox Message Fields

XML Name	Data Model Name	#	Value
<Inbox_Message>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
@result_id	Result ID	0-1	An XML AnyURI containing a Result ID.
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.

XML Name	Data Model Name	#	Value
<Destination_Collection_Name>	Destination Collection Name	0-n	An XML AnyURI containing the Collection Name. Each instance of this field identifies one Destination Collection Name value.
<Message>	Message	0-1	An XML string.
<Source_Subscription>	Subscription Information	0-1	This field's body consists only of the indicated XML Fields.
@collection_name	Collection Name	1	An XML AnyURI containing the Collection Name for the TAXII Data Collection.
<Subscription_ID>	Subscription ID	1	An XML AnyURI containing a Subscription ID value.
<Exclusive_Begin_Timestamp>	Exclusive Begin Timestamp Label	0-1	An XML dateTime value containing a Timestamp Label. This field MUST NOT be present if the named Data Collection is a Data Set. Otherwise, absence of this field indicates that the response covers the earliest content within the Data Feed.
	Inclusive Begin Timestamp Label		*This Data Model Field is not supported in the current version of the XML Message Binding.*
<Inclusive_End_Timestamp>	Inclusive End Timestamp Label	0-1	An XML dateTime value containing a Timestamp Label. This field MUST be present if the named Data Collection is a Data Feed. It MUST NOT be present if the named Data Collection is a Data Set.
<Record Count>	Record Count	0-1	An XML nonNegativeInteger.
@partial_count	Partial Count	0-1	An XML boolean. The default value of this field is false.
<Content_Block>	Content Block	0-n	This field's body consists only of the indicated XML Fields.
<Content_Binding>	Content Binding	1	This field's body consists only of the indicated XML Fields.
@binding_id	Content Binding	1	An XML string containing a Content Binding ID or a content nesting expression (as described in the TAXII Services Specification).

XML Name	Data Model Name	#	Value
<Subtype>	Subtype	0-1	This element has no body. If present, this field identifies a specific subtype of the named Content Binding to which the contained content conforms. Absence of this field means that no assertion about subtype conformance is made.
@subtype_id	Subtype	1	An XML AnyURI containing a Content Binding Subtype ID.
<Content>	Content	1	The body of this element supports mixed content and MAY contain any XML.
<Timestamp_Label>	Timestamp Label	0-1	An XML dateTime value containing a Timestamp Label.
<Message>	Message	0-1	An XML string.
<Padding>	Padding	0-1	An XML string.
<ds:Signature>	Signature	0-n	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and is scoped to the <Content_Block> element in which it resides.
<ds:Signature>	Signature	0-1	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

3.11 Poll Fulfillment Request

Table 15 – Poll Fulfillment Request Fields

XML Name	Data Model Name	#	Value
<Poll_Fulfillment>	Message Body Type	1	The element name indicates the message body type. Its body consists only of the indicated XML Fields.
@message_id	Message ID	1	An XML AnyURI containing a Message ID.
@collection_name	Collection Name	1	An XML AnyURI containing the Collection Name for the TAXII Data Collection.
@result_id	Result ID	1	An XML AnyURI containing a Result ID value.
@result_part_number	Result Part Number	1	An XML positiveInteger.

XML Name	Data Model Name	#	Value
<Extended_Headers>	Extended-Header	0-1	Contains one or more <Extended_Header> elements.
<Extended_Header>	Extended-Header	1-n	The body of this element supports mixed content and MAY contain any XML, as described in Section 2.2.2.
@name	Extended-Header	1	An XML AnyURI with the name of this Extended Header.
<ds:Signature>	Signature	0-1	This element is defined in the XML Signature Syntax and Processing specification [7]. This is an enveloped signature and the potential scope of this signature is the entire TAXII Message.

4 Bibliography

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