

## [MS-IPFFX]:

### InfoPath Form File Format

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Preliminary

## Revision Summary

Date	Revision History	Revision Class	Comments
4/4/2008	0.01	Major	Initial Availability
6/27/2008	1.0	Minor	Revised and edited technical content
10/6/2008	1.01	Editorial	Revised and edited technical content
7/13/2009	1.02	Major	Revised and edited the technical content
8/28/2009	1.03	Editorial	Revised and edited the technical content
11/6/2009	1.04	Editorial	Revised and edited the technical content
2/19/2010	2.0	Minor	Updated the technical content
3/31/2010	2.01	Editorial	Revised and edited the technical content
4/30/2010	2.02	Editorial	Revised and edited the technical content
6/7/2010	2.03	Editorial	Revised and edited the technical content
6/29/2010	2.04	Editorial	Changed language and formatting in the technical content.
7/23/2010	2.05	Minor	Clarified the meaning of the technical content.
9/27/2010	2.05	None	No changes to the meaning, language, or formatting of the technical content.
11/15/2010	2.05	None	No changes to the meaning, language, or formatting of the technical content.
12/17/2010	2.05	None	No changes to the meaning, language, or formatting of the technical content.
3/18/2011	2.05	None	No changes to the meaning, language, or formatting of the technical content.
6/10/2011	2.05	None	No changes to the meaning, language, or formatting of the technical content.
1/20/2012	3.0	Major	Significantly changed the technical content.
4/11/2012	3.0	None	No changes to the meaning, language, or formatting of the technical content.
7/16/2012	3.0	None	No changes to the meaning, language, or formatting of the technical content.
9/12/2012	3.0	None	No changes to the meaning, language, or formatting of the technical content.
10/8/2012	3.1	Minor	Clarified the meaning of the technical content.
2/11/2013	3.1	None	No changes to the meaning, language, or formatting of the technical content.
7/30/2013	3.1	None	No changes to the meaning, language, or formatting of the technical content.
11/18/2013	3.1	None	No changes to the meaning, language, or formatting of the technical content.

Date	Revision History	Revision Class	Comments
2/10/2014	3.1	None	No changes to the meaning, language, or formatting of the technical content.
4/30/2014	3.2	Minor	Clarified the meaning of the technical content.
7/31/2014	3.2	None	No changes to the meaning, language, or formatting of the technical content.
10/30/2014	3.2	None	No changes to the meaning, language, or formatting of the technical content.
2/26/2016	4.0	Major	Significantly changed the technical content.
7/15/2016	4.0	None	No changes to the meaning, language, or formatting of the technical content.
9/14/2016	4.0	None	No changes to the meaning, language, or formatting of the technical content.
9/29/2016	4.0	None	No changes to the meaning, language, or formatting of the technical content.
7/24/2018	5.0	Major	Significantly changed the technical content.

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# 1 Introduction

The InfoPath Form File Format, which, with an associated form template, specifies how a form server will render and edit the data in a form file using a Web browser.

This document also specifies the InfoPath Property Promotion Format.

Sections 1.7 and 2 of this specification are normative. All other sections and examples in this specification are informative.

## 1.1 Glossary

This document uses the following terms:

**big-endian:** Multiple-byte values that are byte-ordered with the most significant byte stored in the memory location with the lowest address.

**Coordinated Universal Time (UTC):** A high-precision atomic time standard that approximately tracks Universal Time (UT). It is the basis for legal, civil time all over the Earth. Time zones around the world are expressed as positive and negative offsets from UTC. In this role, it is also referred to as Zulu time (Z) and Greenwich Mean Time (GMT). In these specifications, all references to UTC refer to the time at UTC-0 (or GMT).

**Uniform Resource Locator (URL):** A string of characters in a standardized format that identifies a document or resource on the World Wide Web. The format is as specified in [\[RFC1738\]](#).

**MAY, SHOULD, MUST, SHOULD NOT, MUST NOT:** These terms (in all caps) are used as defined in [\[RFC2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

## 1.2 References

Links to a document in the Microsoft Open Specifications library point to the correct section in the most recently published version of the referenced document. However, because individual documents in the library are not updated at the same time, the section numbers in the documents may not match. You can confirm the correct section numbering by checking the [Errata](#).

### 1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com). We will assist you in finding the relevant information.

[ISO-8601] International Organization for Standardization, "Data Elements and Interchange Formats - Information Interchange - Representation of Dates and Times", ISO/IEC 8601:2004, December 2004, <http://www.iso.org/iso/en/CatalogueDetailPage.CatalogueDetail?CSNUMBER=40874&ICS1=1&ICS2=1.40&ICS3=30>

**Note** There is a charge to download the specification.

[MS-IPFF2] Microsoft Corporation, "[InfoPath Form Template Format Version 2](#)".

[MS-WSSTS] Microsoft Corporation, "[Windows SharePoint Services](#)".

[RFC1321] Rivest, R., "The MD5 Message-Digest Algorithm", RFC 1321, April 1992, <http://www.ietf.org/rfc/rfc1321.txt>

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, <http://www.rfc-editor.org/rfc/rfc2119.txt>

[RFC2781] Hoffman, P., and Yergeau, F., "UTF-16, an encoding of ISO 10646", RFC 2781, February 2000, <http://www.rfc-editor.org/rfc/rfc2781.txt>

[RFC3066] Alvestrand, H., "Tags for the Identification of Languages", BCP 47, RFC 3066, January 2001, <http://www.ietf.org/rfc/rfc3066.txt>

[RFC3174] Eastlake III, D., and Jones, P., "US Secure Hash Algorithm 1 (SHA1)", RFC 3174, September 2001, <http://www.ietf.org/rfc/rfc3174.txt>

[RFC4648] Josefsson, S., "The Base16, Base32, and Base64 Data Encodings", RFC 4648, October 2006, <http://www.rfc-editor.org/rfc/rfc4648.txt>

[RFC5234] Crocker, D., Ed., and Overell, P., "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, January 2008, <http://www.rfc-editor.org/rfc/rfc5234.txt>

[W3C-PNG] World Wide Web Consortium, "Portable Network Graphics (PNG) Specification, Second Edition", November 2003, <http://www.w3.org/TR/PNG>

[W3C-XML] Bray, T., Paoli, J., Sperberg-McQueen, C.M., Maler, E., Yergeau, F., Eds., "Extensible Markup Language (XML) 1.1 (Second Edition)", W3C Recommendation, August 2006, <http://www.w3.org/TR/2006/REC-xml11-20060816/>

[XMLDSig] Bartel, M., Boyer, J., Fox, B., et al., "XML-Signature Syntax and Processing", W3C Recommendation, February 2002, <http://www.w3.org/TR/2002/REC-xmlsig-core-20020212/>

[XMLSCHEMA1] Thompson, H., Beech, D., Maloney, M., and Mendelsohn, N., Eds., "XML Schema Part 1: Structures", W3C Recommendation, May 2001, <http://www.w3.org/TR/2001/REC-xmlschema-1-20010502/>

[XML] World Wide Web Consortium, "Extensible Markup Language (XML) 1.0 (Fourth Edition)", W3C Recommendation 16 August 2006, edited in place 29 September 2006, <http://www.w3.org/TR/2006/REC-xml-20060816/>

[XPath] Clark, J. and DeRose, S., "XML Path Language (XPath), Version 1.0", W3C Recommendation, November 1999, <http://www.w3.org/TR/1999/REC-xpath-19991116/>

### 1.2.2 Informative References

[MS-LISTSWS] Microsoft Corporation, "[Lists Web Service Protocol](#)".

[MSDN-AFI] Microsoft Corporation, "Attaching Files in InfoPath 2003", September 2004, [http://msdn.microsoft.com/en-us/library/bb608318\(office.11\).aspx](http://msdn.microsoft.com/en-us/library/bb608318(office.11).aspx)

## 1.3 Overview

This document specifies two distinct file formats associated with InfoPath electronic forms:

1. **InfoPath Form File Format:** This is the format for InfoPath form files, which are used to store data for a form that has been filled out. The format is introduced in section [1.3.1](#) and described in section [2.1](#).

A form file is used to store the data of an electronic form that has been filled out by a user. It is an Extensible Markup Language file, as described in [\[XML\]](#) that conforms to the XML Schema of the associated form template. The associated form template specifies how a form server will render and edit the data in the form file using a Web browser. The format for the associated form template is described in [\[MS-IPFF2\]](#).

For example, an expense report submitted by an employee can be represented as a form file. It will contain all the data in the report, such as the total amount spent, date and employee. The form file will have an associated form template that specifies how that form file can be rendered and edited in a Web browser.

2. **InfoPath Property Promotion Format:** This format is used to communicate to a SharePoint document library which fields inside an electronic form will be displayed as columns in the document library. The format is introduced in section [1.3.2](#) and described in section [2.2](#).

A property promotion file is used to communicate to a SharePoint document library which fields inside an electronic form will be displayed as columns in the SharePoint document library. For example, in a document library used to collect expense reports, each of which is a form file submitted by an employee, this format can be used to make the library display the total amount and the submitter of the report as columns.

### 1.3.1 The InfoPath XML File

A form file is an XML file, as described in [\[XML\]](#), which stores the data for a form that has been filled out. It consists of two major components: XML processing instructions, as described in [\[XML\]](#) section 2.6, and data conforming to the XML Schema Document (XSD).

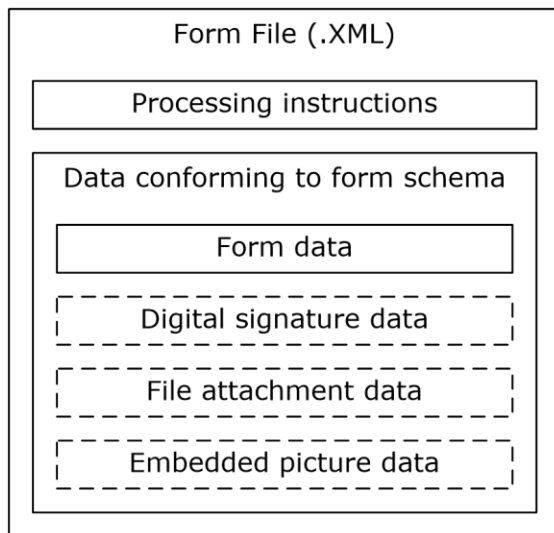
The form file begins with a set of XML processing instructions that:

1. Identify this XML file as a form file.
2. Specify the associated form template, which in turn specifies how the data in the form file is rendered and edited, as described in [\[MS-IPFF2\]](#).

The form file contains XML data conforming to the XML Schema Document (XSD) of the form. This XML schema is defined by the XML Schema Document (XSD) described in [\[MS-IPFF2\]](#) section 2.3. That data includes 3 optional pieces:

1. **File attachment data:** If files are attached to the form file, the form file contains a representation of those files.
2. **Digital signature data:** If the form file has been signed with a digital signature, as described in [\[XMLDSig\]](#), it contains a digital signature property structure.
3. **Embedded picture data:** If a picture is embedded in the form file, the form file contains a representation of that picture.

The following figure illustrates the structure of a form file.



**Figure 1: Structure of a form file**

The structures used to represent file attachment data and digital signature data are introduced in the following sections.

The form file is described in section [2.1](#).

#### **1.3.1.1 InfoPath XML Processing Instructions**

The XML processing instructions provide information to a server or client application identifying the XML file in which the XML processing instructions appear as a form file. Additionally, the XML processing instructions specify to how to correctly interpret and access the data in this file.

The processing instructions are described in section [2.1.1](#). For a detailed example, see section [3.1.1](#).

#### **1.3.1.2 Digital Signature Property Structure**

This structure is used to represent metadata concerning the generation of an XML digital signature, as described in [\[XMLDSig\]](#). The use of this metadata is intended to be proof of environment settings in use during the signing of the form file such as system, screen and form template information. This metadata, called XML digital signature property information, is stored in a SignatureProperty element of an XML digital signature structure, described in [\[XMLDSig\]](#).

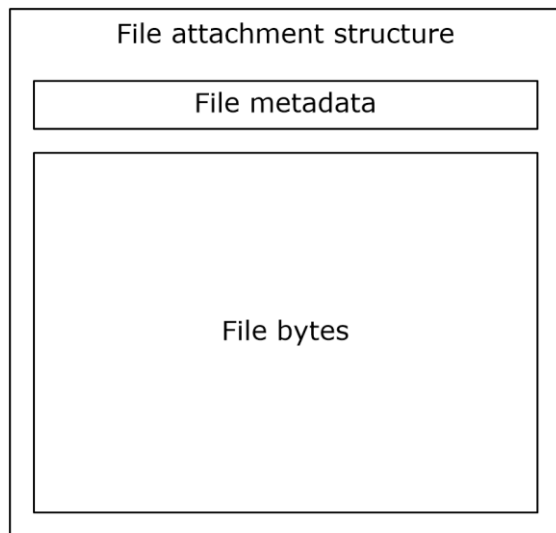
The digital signature property structure is described in section [2.1.2](#). For a detailed example, see section [3.1.2](#).

#### **1.3.1.3 File Attachment Data Format**

This structure is used to represent an attached file inside a form file. The attached file can be retrieved by parsing and processing this structure.

The file attachment structure is composed of two parts: file metadata and file bytes. The file metadata contains information about the attachment, such as the file name and the size of the file in bytes. The file bytes contain the bytes of the attached file encoded in base 64, as described in [\[RFC4648\]](#).

The following figure illustrates the file attachment structure.



**Figure 2: File attachment structure**

The file attachment structure is described in section [2.1.3](#). For a detailed example, see section [3.1.3](#).

#### **1.3.1.4 Embedded Picture Data Format**

This structure is used to represent an embedded picture inside a form file. The picture can be retrieved by processing this structure.

The embedded picture structure is a base 64 encoded representation, as described in [\[RFC4648\]](#), of the bytes used to encode and persist the image in its original file format.

The embedded picture structure is described in section [2.1.4](#). For a detailed example, see section [3.1.4](#).

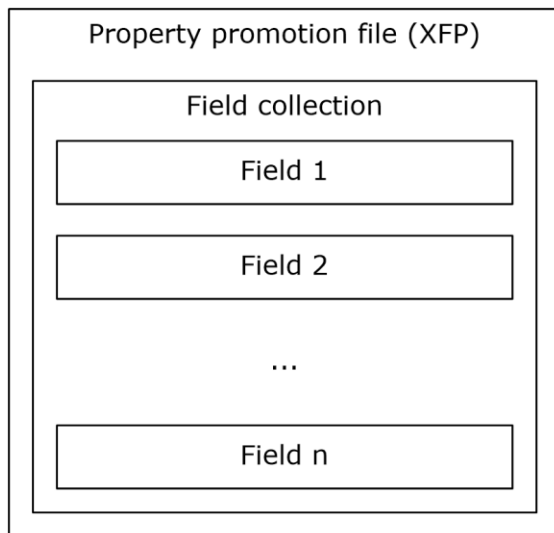
### **1.3.2 The InfoPath Property Promotion (XFP) Format**

Property promotion can be accomplished in the following ways:

- Creating the appropriate fields in the SharePoint document library using the web services as described in [\[MS-LISTSWS\]](#).
- Creating a properties.xfp file and publishing it to the appropriate location on the SharePoint document library.

Both approaches specify what fields are to be promoted and how these fields will appear. The best practice is to use the first method. This document specifies the second approach.

The properties.xfp file is an XML file, as described in [\[XML\]](#), and is placed in the document library. The file specifies the field mappings from a source XML file to a set of destination fields. The properties.xfp file specifies properties including type, name and visibility. The structure of the properties.xfp file is as follows.



**Figure 3: Structure of the property promotion format**

The properties.xfp file is an XML file and validates against the XML schema provided in the section [5.2](#). The file has only two XML elements. The parent element is **Fields** (section [2.2.1](#)) with any number of **Field** (section [2.2.2](#)) child elements.

The property promotion format is described in section [2.2](#). For a detailed example, see section [3.2](#).

## 1.4 Relationship to Protocols and Other Structures

### 1.4.1 Digital Signature Property Structure

The XML digital signature property structure is an extension of the **SignatureProperty** element of an XML digital signature structure, as described in [\[XMLDSig\]](#). The XML digital signature property structure is dependent on base 64 encoding, as described in [\[RFC4648\]](#), and PNG, as described in [\[W3C-PNG\]](#), for storage of some of its elements in XML, described in [\[XML\]](#). It is not dependent on any other protocols or other structures.

### 1.4.2 File Attachment Data Format

The file attachment structure is dependent on base 64 encoding, as described in [\[RFC4648\]](#), for storage in XML, described in [\[XML\]](#). It is not dependent on any other protocols or other structures.

### 1.4.3 Embedded Picture Data Format

The embedded picture structure is dependent on base 64 encoding, as described in [\[RFC4648\]](#), for storage in XML, described in [\[XML\]](#). It is not dependent on any other protocols or other structures.

## 1.5 Applicability Statement

### 1.5.1 The InfoPath XML File

Any saved data based on a form template uses the XML structure that is described in this document.

### 1.5.1.1 File Attachment Data Format

The file attachment structure can be used to attach files to a form file. Attaching files smaller than two megabytes in size is usually appropriate, but larger files could introduce performance problems. For larger files that need to be associated with the form file, linking to them is recommended instead of attaching them. Also, not all files types are supported as attachments, as described in section [2.1.3.1](#).

### 1.5.1.2 Embedded Picture Data Format

The embedded picture structure can be used to attach pictures to a form file. Attaching pictures smaller than 2 megabytes in size is usually appropriate, but larger pictures could introduce performance problems. For larger pictures that need to be associated with the form file, linking to them is recommended instead of attaching them.

### 1.5.2 The InfoPath Property Promotion (XFP) Format

The property promotion file is used to expose values from a form file to the end-user, as columns in a SharePoint document library.

## 1.6 Versioning and Localization

This document covers versioning issues in the following areas:

1. **Structure versions:** This document specifies version 1 for all structures defined in this document.
2. **Localization:** There are no localization issues.

## 1.7 Vendor-Extensible Fields

None.

## 2 Structures

### 2.1 The InfoPath XML File

This file is a valid XML file, as specified in [\[XML\]](#), which conforms to the XSD specification in [\[MS-IPFF2\]](#) section 2.3.

#### 2.1.1 InfoPath XML Processing Instructions Specification

Three XML processing instruction tags, as specified in [\[XML\]](#), section 2.6, **MUST** appear in the form file: `<?mso-infoPathSolution...?>`, `<?mso-application...?>` and `<?mso-infoPath-file-attachment-present?>`.

A formal specification of these XML processing instructions, given in Augmented Backus-Naur Form (ABNF), as specified in [\[RFC5234\]](#), is as follows:

```
PI = MSO-INFOPATHSOLUTION MSO-APPLICATION [MSO-INFOPATH-FILE-ATTACHMENT-PRESENT]

MSO-INFOPATHSOLUTION = '<?mso-infoPathSolution ' [SOLUTION_VERSION] PRODUCT_VERSION
PI_VERSION HREF [NAME] [LANGUAGE] [INITIAL_VIEW] '?>' CRLF
SOLUTION_VERSION = 'solutionVersion="' ATT_VALUE '"'
PRODUCT_VERSION = 'productVersion="' VERSION_VALUE '"'
VERSION_VALUE = '12.0.0.0' / '12.0.0' / '14.0.0.0' / '14.0.0' / '15.0.0.0' / '15.0.0'
PI_VERSION = 'PIVersion="1.0.0.0"'
HREF = 'href="' ATT_VALUE '"'
NAME = 'name="' ATT_VALUE '"'
LANGUAGE = 'language="' LANGUAGE_TAG '"'
LANGUAGE_TAG is defined as Language-Tag as specified in \[RFC3066\], section 2.1.
INITIAL_VIEW = 'initialView="' ATT_VALUE '"'
ATT_VALUE is defined as AttValue as specified in \[W3C-XML\], section 2.3.

MSO-APPLICATION = '<? mso-application ' PROG_ID VERSION_PROG_ID '?>' CRLF
PROG_ID = 'progid = "InfoPath.Document"'
VERSION_PROG_ID = 'versionProgid="' PROG_ID_VALUE '"'
PROG_ID_VALUE = 'InfoPath.Document.2' / 'InfoPath.Document.3'

MSO-INFOPATH-FILE-ATTACHMENT-PRESENT = '<?mso-infoPath-file-attachment-present?>' CRLF
```

##### 2.1.1.1 mso-infoPathSolution

One XML processing instruction tag named *mso-infoPathSolution* **MUST** be specified as part of the form file. This XML processing instruction tag specifies properties, as defined by the following attributes, of this form file and the associated form template.

Attribute	Description
fileFormatVersion	Reserved for future use. This attribute <b>MUST NOT</b> be present.
href	The value of this attribute <b>MUST</b> be set to the <b>Uniform Resource Locator (URL)</b> of the form template upon which this form file is based.
initialView	This attribute specifies which form view to display when this form file is first loaded. If the <b>initialView</b> attribute is not specified or if the value of this attribute is not a valid form view name as specified in the form definition (.xsf) file at <a href="#">[MS-IPFF2]</a> , section 2.2.1.2.104, then this attribute <b>MUST</b> be ignored and the view designated as the default view <b>MUST</b> be shown.
language	This <b>MUST</b> be specified if the form template is designed against a fixed

Attribute	Description
	schema and that schema does not allow the "xml:lang" attribute, as specified in <a href="#">[XML]</a> , section 2.12, to be set on the root XML node. The value of this attribute specifies the locale, as specified in <a href="#">[RFC3066]</a> , of the form file. Otherwise, this MUST NOT be specified.
name	This SHOULD be specified. If this attribute is specified, then its value MUST equal the value of the attribute defined in the form definition (.xsf) file, as specified in <a href="#">[MS-IPFF2]</a> , section 2.2.1.2.1, of the form template that exists at the location specified by the value of the <b>href</b> attribute.
PIVersion	Specifies the version number of the mso-infoPathSolution XML processing instruction tag. The value of this attribute MUST be set to "1.0.0.0".
productVersion	Specifies what application version was last used to modify this form file. The value of this attribute MUST be "12.0.0", "14.0.0" or "15.0.0". <a href="#">&lt;1&gt;</a>
solutionVersion	Specifies the version of the form template with which this form file was created. This SHOULD be set to the same value as specified in the <b>solutionVersion</b> attribute of the <b>xDocumentClass</b> element in the form definition (.xsf) file, as specified in <a href="#">[MS-IPFF2]</a> , section 2.2.1.2.1, when the form file was created. The value of this attribute allows the form server loading this form file to know whether the XML data needs to be upgraded to match the form template. If this attribute is not specified, then no such upgrade is attempted.
version	DEPRECATED. <b>version</b> is the legacy attribute equivalent to the <b>solutionVersion</b> attribute. The <b>version</b> attribute MUST NOT be present.

### 2.1.1.2 mso-application

One XML processing instruction tag named *mso-application* MUST be specified as part of the form file. This XML processing instruction tag's attributes, as defined by the following attributes, specify which client application to use to open this form file.

Attribute	Description
Progid	Specifies what client application will open this form file. This MUST be set to "InfoPath.Document".
versionProgid	Specifies what client application version was used to create this form file. It MUST be set to "InfoPath.Document.2" or "InfoPath.Document.3"

### 2.1.1.3 mso-infoPath-file-attachment-present

If a form template contains a file attachment control, as specified in [\[MS-IPFF2\]](#), section 2.3.1.7, the resulting form file MUST include the following XML processing instruction tag: "<?mso-infoPath-file-attachment-present?>".

If no file attachment control exists in the form template, then the form file SHOULD NOT contain this XML processing instruction tag. However, once this XML processing instruction is placed in a file, it MUST NOT be removed regardless of whether the file attachment control still exists in subsequent versions of the form template.

This XML processing instruction tag MUST NOT contain attributes.

## 2.1.2 Digital Signature Property Structure Specification

This section specifies the XML syntax used to represent metadata concerning the generation of an XML digital signature, as specified in [\[XMLDSig\]](#). This metadata, called XML digital signature property information, is stored in a **SignatureProperty** element of an XML digital signature structure, as specified in [\[XMLDSig\]](#).

The specific field in the form file containing digital signature information is specified by the **documentSignatures** element in the form definition (.xsf) file, as specified in [\[MS-IPFF2\]](#), section 2.2.1.2.106.

### 2.1.2.1 Comment

This element specifies the comment provided by the user for the signature. The value of this element MUST be a valid UNICODE UTF-16 string, as specified in [\[RFC2781\]](#).

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Comment" type="xsd:string"/>
```

### 2.1.2.2 NonRepudiation

This element specifies metadata concerning the generation of an XML digital signature, as specified in [\[XMLDSig\]](#).

Child Elements
<a href="#">InvalidSignedImage</a>
<a href="#">ScreenDumpPNG</a>
<a href="#">ScreenInformation</a>
<a href="#">SignatureImage</a>
<a href="#">SignatureText</a>
<a href="#">SolutionInformation</a>
<a href="#">SystemInformation</a>
<a href="#">UntrustedSystemDateTime</a>
<a href="#">ValidSignedImage</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="NonRepudiation">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="sp:UntrustedSystemDateTime" minOccurs="1"/>
      <xsd:element ref="sp:SystemInformation" minOccurs="1"/>
      <xsd:element ref="sp:ScreenInformation" minOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
```

```

<xsd:element ref="sp:SolutionInformation" minOccurs="1"/>
<xsd:element ref="sp:ScreenDumpPNG" minOccurs="1"/>
<xsd:choice minOccurs="0" maxOccurs="1">
  <xsd:element ref="sp:SignatureText" minOccurs="0"/>
  <xsd:element ref="sp:SignatureImage" minOccurs="0"/>
</xsd:choice>
<xsd:element ref="sp:ValidSignedImage" minOccurs="0"/>
<xsd:element ref="sp:InvalidSignedImage" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
</xsd:element>

```

### 2.1.2.3 UntrustedSystemDateTime

This element specifies the system date and time of the client computer at the time of signing. The value of this element MUST be expressed in **Coordinated Universal Time (UTC)** using the "complete date plus hours, minutes and seconds" format as specified in [ISO-8601](#).

Parent Elements
<a href="#">NonRepudiation</a>

The following W3C XML Schema ([XMLSCHEMA1](#) section 2.1) fragment specifies the contents of this element.

```

<xsd:element name="UntrustedSystemDateTime" type="xsd:dateTime"/>

```

### 2.1.2.4 SystemInformation

This element specifies system information of both the client computer and the server computer in use at the time of signing.

Parent Elements
<a href="#">NonRepudiation</a>

Child Elements
<a href="#">Browser</a>
<a href="#">InfoPath</a>
<a href="#">Office</a>
<a href="#">OperatingSystem</a>
<a href="#">ServerVersion</a>
<a href="#">SigningControl</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="SystemInformation">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="sp:OperatingSystem" minOccurs="1"/>
      <xsd:element ref="sp:Office" minOccurs="1"/>
      <xsd:element ref="sp:InfoPath" minOccurs="1"/>
      <xsd:element ref="sp:ServerVersion" minOccurs="0"/>
      <xsd:element ref="sp:Browser" minOccurs="0"/>
      <xsd:element ref="sp:SigningControl" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
```

### 2.1.2.5 OperatingSystem

This element specifies the version of the operating system on the client computer at the time of signing.

Parent Elements
<a href="#">SystemInformation</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="OperatingSystem">
  <xsd:simpleType>
    <xsd:restriction base="xsd:decimal">
      <xsd:pattern value="[0-9][.][0-9]"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
```

### 2.1.2.6 Office

This element specifies the version of the client application used at the time of signing on the client computer. When the client application signs the form, the element MUST be "12.0"[<2>](#), "14.0"[<3>](#) or "15.0"[<4>](#). When the form server signs the form in the Web browser, the value of this element MUST be "(N/A)".

Parent Elements
<a href="#">SystemInformation</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Office">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="12.0"/>
      <xsd:enumeration value="14.0"/>
      <xsd:enumeration value="15.0"/>
      <xsd:enumeration value="(N/A)"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
```

### 2.1.2.7 InfoPath

This element specifies the version of the client application used at the time of signing on the client computer. When the client application signs the form, the element MUST be "12.0"[\[5\]](#), "14.0"[\[6\]](#), or "15.0"[\[7\]](#). When the form server signs the form in the Web browser, the value of this element MUST be "(N/A)".

<b>Parent Elements</b>
------------------------

<a href="#">SystemInformation</a>
-----------------------------------

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="InfoPath">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="12.0"/>
      <xsd:enumeration value="14.0"/>
      <xsd:enumeration value="15.0"/>
      <xsd:enumeration value="(N/A)"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
```

### 2.1.2.8 ServerVersion

This element specifies the version of the form server that last edited the form file. When the form server signs the form in the Web browser, the value of this element MUST be "12", "14", or "15". When signing using the client computer, this element MUST be omitted.

<b>Parent Elements</b>
------------------------

<a href="#">SystemInformation</a>
-----------------------------------

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ServerVersion">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="12"/>
      <xsd:enumeration value="14"/>
      <xsd:enumeration value="15"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
```

#### 2.1.2.9 Browser

This element specifies the name of the Web browser used by the form server to sign the form. When signing using the client computer, this element MUST be omitted.

Parent Elements
<a href="#">SystemInformation</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Browser">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="Microsoft Internet Explorer 6.0"/>
      <xsd:enumeration value="Microsoft Internet Explorer 7.0"/>
      <xsd:enumeration value="Microsoft Internet Explorer 8.0"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>
```

#### 2.1.2.10 SigningControl

This element specifies the version of the control used to sign the form. When the form server signs the form in the Web browser, the value of this element MUST be "12" or "14". When signing using the client computer, this element MUST be omitted.

Parent Elements
<a href="#">SystemInformation</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="SigningControl">
  <xsd:simpleType>
```

```

    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="12"/>
      <xsd:enumeration value="14"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>

```

### 2.1.2.11 ScreenInformation

This element specifies specific information about the client computer's screen.

Parent Elements
<a href="#">NonRepudiation</a>

Child Elements
<a href="#">NrOfMonitors</a>
<a href="#">PrimaryMonitor</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```

<xsd:element name="ScreenInformation">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="sp:NrOfMonitors" minOccurs="1"/>
      <xsd:element ref="sp:PrimaryMonitor" minOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

```

### 2.1.2.12 NrOfMonitors

This element specifies the number of monitors enabled on the client computer at the time of signing.

Parent Elements
<a href="#">ScreenInformation</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```

<xsd:element name="NrOfMonitors" type="xsd:integer"/>

```

### 2.1.2.13 PrimaryMonitor

This element specifies specific information about the client computer's primary monitor.

Parent Elements
<a href="#">ScreenInformation</a>

Child Elements
<a href="#">ColorDepth</a>
<a href="#">Height</a>
<a href="#">Width</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="PrimaryMonitor">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="sp:Width" minOccurs="1"/>
      <xsd:element ref="sp:Height" minOccurs="1"/>
      <xsd:element ref="sp:ColorDepth" minOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
```

### 2.1.2.14 Width

This element specifies the width of the primary monitor on the client computer at the time of signing.

Parent Elements
<a href="#">PrimaryMonitor</a>

Attributes:

**Unit:** This attribute specifies the unit of measure being used for the value of Width. The value of this attribute MUST be set to "px".

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Width">
  <xsd:complexType>
    <xsd:simpleContent>
      <xsd:extension base="xsd:integer">
        <xsd:attribute name="Unit">
          <xsd:simpleType>
```

```

        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="px"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
  </xsd:extension>
</xsd:simpleContent>
</xsd:complexType>
</xsd:element>

```

### 2.1.2.15 Height

This element specifies the height of the primary monitor on the client computer at the time of signing.

#### Parent Elements

[PrimaryMonitor](#)

Attributes:

**Unit:** This attribute specifies the unit of measure being used for the value of Height. The value of this attribute MUST be set to "px".

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```

<xsd:element name="Height">
  <xsd:complexType>
    <xsd:simpleContent>
      <xsd:extension base="xsd:integer">
        <xsd:attribute name="Unit">
          <xsd:simpleType>
            <xsd:restriction base="xsd:string">
              <xsd:enumeration value="px"/>
            </xsd:restriction>
          </xsd:simpleType>
        </xsd:attribute>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
</xsd:element>

```

### 2.1.2.16 ColorDepth

This element specifies the color depth of the primary monitor on the client computer at the time of signing.

#### Parent Elements

[PrimaryMonitor](#)

Attributes:

**Unit:** This attribute specifies the unit of measure being used for the value of ColorDepth. The value of this attribute MUST be set to "bpp".

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ColorDepth">
  <xsd:complexType>
    <xsd:simpleContent>
      <xsd:extension base="xsd:integer">
        <xsd:attribute name="Unit">
          <xsd:simpleType>
            <xsd:restriction base="xsd:string">
              <xsd:enumeration value="bpp"/>
            </xsd:restriction>
          </xsd:simpleType>
        </xsd:attribute>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
</xsd:element>
```

### 2.1.2.17 SolutionInformation

This element specifies specific information about the form template being used on the client computer.

Parent Elements
<a href="#">NonRepudiation</a>

Child Elements
<a href="#">CurrentView</a>
<a href="#">SolutionFingerprint</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="SolutionInformation">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="sp:SolutionFingerprint" minOccurs="1"/>
      <xsd:element ref="sp:CurrentView" minOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
```

### 2.1.2.18 SolutionFingerprint

This element specifies a hash of the first 2 megabytes of the form template being used on the client computer. The value of this element **MUST** be computed using one of the following algorithms: the MD5 message-digest algorithm, as specified in [\[RFC1321\]](#) or the US Secure Hash Algorithm 1 (SHA1), as specified in [\[RFC3174\]](#). The length of this field will determine which algorithm was used: MD5 for 128 bits (16 bytes) and SHA1 for 160 bits (20 bytes). This element **MUST** be empty if the size in bytes of the form template is greater than 2 megabytes.

<b>Parent Elements</b>
------------------------

<a href="#">SolutionInformation</a>
-------------------------------------

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="SolutionFingerprint" type="xsd:string"/>
```

#### 2.1.2.19 CurrentView

This element specifies the name of the form template's active view at the time of signing.

<b>Parent Elements</b>
------------------------

<a href="#">SolutionInformation</a>
-------------------------------------

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="CurrentView" type="xsd:string"/>
```

#### 2.1.2.20 ScreenDumpPNG

This element specifies a PNG representation of the view, as specified in [\[W3C-PNG\]](#), which is active at the time of signing. The PNG image MUST be Base64 encoded, as specified in [\[RFC4648\]](#).

<b>Parent Elements</b>
------------------------

<a href="#">NonRepudiation</a>
--------------------------------

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ScreenDumpPNG" type="xsd:base64Binary"/>
```

#### 2.1.2.21 SignatureText

This element specifies the text provided by the user for the signature. The value of this element MUST be a valid UNICODE UTF-16 string, as specified in [\[RFC2781\]](#). When the form server signs the form in the Web browser, this element MUST be omitted.

<b>Parent Elements</b>
------------------------

<a href="#">NonRepudiation</a>
--------------------------------

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="SignatureText" type="xsd:string"/>
```

### 2.1.2.22 SignatureImage

This element specifies the image provided by the user for the signature and it represents a graphical image of the user's signature. When the form server signs the form in the Web browser, this element MUST NOT be present. The value of this element MUST be Base64 encoded, as specified in [\[RFC4648\]](#) and MUST be one of the following allowed image types:

- emf
- wmf
- jpg
- jpeg
- jfif
- jpe
- png
- bmp
- dib
- rle
- bmz
- gif
- gfa
- emz
- wmz
- pcz
- tif
- tiff
- cgm
- eps

- pct
- pict
- wpg

Parent Elements
<a href="#">NonRepudiation</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="SignatureImage" type="xsd:base64Binary"/>
```

### 2.1.2.23 ValidSignedImage

The form server MUST ignore this element. When the form server signs the form in the Web browser, this element MUST be omitted.

Parent Elements
<a href="#">NonRepudiation</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ValidSignedImage" type="xsd:base64Binary"/>
```

### 2.1.2.24 InvalidSignedImage

The form server MUST ignore this element. When the form server signs the form in the Web browser, this element MUST be omitted.

Parent Elements
<a href="#">NonRepudiation</a>

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="InvalidSignedImage" type="xsd:base64Binary"/>
```

### 2.1.3 File Attachment Data Format Specification

This section specifies the file attachment structure. The file attachment content **MUST** be Base64 encoded, as specified in [\[RFC4648\]](#), before written to the form file. All of the bytes in this section are expressed in **big-endian** byte order.

Fields in the form containing file attachment data **MUST** be associated with a file attachment control. The file attachment control is specified in [\[MS-IPFF2\]](#), sections 2.3.1.7 and 2.4.1.11.

#### 2.1.3.1 File Metadata

The file metadata part **MUST** include information about the file attachment.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
File Attachment Signature																															
Header Size																															
Version Information																															
Reserved space																															
File size																															
File Name Length																															
File Name Buffer (variable)																															

The file metadata consists of the following fields:

**File attachment signature (4 bytes):** A 32-bit constant value that specifies the file attachment structure as a file attachment. The value of this field **MUST** be 0xC7494641.

**Header size (4 bytes):** A 32-bit unsigned integer that specifies the size in bytes of the version information, reserved space, file size, file name length and header size. The value of this field **MUST** be 0x14000000.

**Version information (4 bytes):** A 32-bit unsigned integer that specifies the version of the file attachment structure. The value of this field **MUST** be 0x01000000.

**Reserved space (4 bytes):** A 32-bit reserved space. The value of this field **MUST** be 0x00000000.

**File size (4 bytes):** A 32-bit unsigned integer that specifies the size in bytes of the attached file. The value of this field **MUST** be equal to the number of bytes in the file bytes part of the file attachment structure.

**File name length (4 bytes):** A 32-bit unsigned integer that specifies the number of UNICODE UTF-16 characters, as specified in [\[RFC2781\]](#), in the file name buffer. The value of this field **MUST** be equal to the number of UNICODE UTF-16 characters in the file name including one terminating zero and it **MUST** be greater than 1.

**File name buffer (variable):** A variable length array of bytes that specifies the name of the attached file. This value of this field **MUST** use UNICODE UTF-16, as specified in [\[RFC2781\]](#), to store each character in the file name. The value of this field is arbitrary and **MUST** terminate with zero. The

file extension for the file name, which is the last characters after the last period in the file name, MUST NOT be one of the following:

ade, adp, app, asp, bas, bat, cer, chm, cmd, com, cpl, crt, csh, exe, fpx, gadget, hlp, hta, inf, ins, isp, its, js, jse, ksh, lnk, mad, maf, mag, mam, maq, mar, mas, mat, mau, mav, maw, mda, mdb, mde, mdt, mdw, mdz, msc, MSI, MSP, MST, ops, pcd, pif, prf, prg, ps1, ps1xml, ps2, ps2xml, psc1, psc2, pst, reg, scf, scr, sct, shb, shs, tmp, url, vb, vbe, vbs, vsmacros, vss, vst, vsw, ws, wsc, wsf or wsh.

The size in bytes of this field MUST be calculated from the file name length in file metadata as follows:

```
file name length * 2
```

### 2.1.3.2 File Bytes

The file bytes are a variable length array of bytes that specifies the contents in bytes of the file to be attached. The size in bytes of this field MUST be specified in the **file size** field in file metadata.

### 2.1.3.3 File Attachment Processing Instruction

See section [2.1.1.3](#) for the specification of the File Attachment XML processing instruction.

### 2.1.4 Embedded Picture Data Format Specification

This section specifies the embedded picture structure. The embedded picture content MUST be Base64 encoded, as specified in [\[RFC4648\]](#), before written to the form file.

The embedded picture content is a variable length array of bytes that specifies the contents in bytes of the picture in its original file format.

Fields in the form containing embedded picture data MUST be associated with an embedded picture control. The embedded picture control is specified in [\[MS-IPFF2\]](#) section 2.3.2.5 and [\[MS-IPFF2\]](#) section 2.4.1.21.5. [<8>](#)

## 2.2 The InfoPath Property Promotion (XFP) Format Specification

This section specifies the structure of the property promotion file. This file MUST be an XML file, as specified in [\[XML\]](#), and named properties.xfp file. Also, it MUST be placed in the document library in the same directory as the form template. This MUST contain only the following simple types and complex types, both as specified in [\[XML\]](#):

- **Fields**
- **Field**
- **FieldType**
- **Aggregation**
- **TrueFalse**

### 2.2.1 Fields

This element is the top level element of the property promotion file. The type of the Fields element is FieldCollectionType.

<b>Child Elements</b>
-----------------------

<a href="#">Field</a>
-----------------------

Attributes:

**FormAggregation:** Specifies whether multiple form files can be merged into a single form file. If the **enabled** attribute of the **importParameters** element in the form definition (.xsf) file, as specified in [\[MS-IPFF2\]](#), section 2.2.1.2.48, equals "yes", then **FormAggregation** MUST be set to "TRUE". Otherwise, it MUST be set to "FALSE".

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xs:element name="Fields" type="pp:FieldCollectionType"/>
<xs:complexType name="FieldCollectionType">
  <xs:sequence>
    <xs:element ref="pp:Field" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="FormAggregation" type="xs:string"/>
</xs:complexType>
```

## 2.2.2 Field

This element is used to describe the promoted properties for the form. The type of Field element is PropertyPromotionFieldType.

<b>Parent Elements</b>
------------------------

<a href="#">Fields</a>
------------------------

Attributes:

**Aggregation:** This specifies the way that multiple values from a form are reduced to a single value. If the XPath expression, as specified in [\[XPATHT\]](#), given in the **Node** attribute is evaluated against the form and produces either a collection of values or a rich text box control, as specified in [\[MS-IPFF2\]](#), section 2.3.1.13, then this attribute MUST be set. Otherwise, this attribute MUST NOT be present.

**DisplayName:** If the **Type** attribute equals "Signature", "ProgID", or "Link", then this MUST NOT be specified. Otherwise, this MUST be set to the display name that is used to identify this **Field**.

**Format:** This MUST be set to "DateOnly" when the XSD data type of the field in the form given by the **Node** attribute is "xsd:date". Otherwise, this MUST NOT be present.

**Hidden:** This specifies whether this **Field** is completely hidden from the user interface. "TRUE" or "true" hides this **Field** completely, and "FALSE" or "false" allows it to be displayed.

**MaxLength:** This defines the maximum length of the content in bytes for the data resulting from this **Field** entry. This MUST NOT be specified.

**Name:** Specifies a unique name for the **Field**. This MUST be set for all **Field** elements, except those whose **Type** attribute is "ProgID", "Link" or "Signature". For those elements, this attribute MUST NOT be present.

**Node:** Specifies the XPath expression for the field in the form to promote. When the **Type** attribute is "ProgID" or "Link", this attribute MUST NOT be specified. For all other elements, this MUST be specified.

**PIAttribute:** Specifies which attribute of the XML processing instruction given by the **PITarget** attribute in the form file to process. If the **PIAttribute** attribute is specified, then the **PITarget** attribute MUST be specified and the **Node** attribute MUST NOT be specified.

**PITarget:** Specifies which XML processing instruction on the form files to process. If the **PITarget** attribute is specified, then the **PIAttribute** attribute MUST be set and the **Node** attribute MUST NOT be present.

**ReadOnly:** Specifies if the value can be edited and saved to the document library. This MUST be set to "TRUE" or "true" for all elements, except those whose **Type** attribute equals "Link". In that case, the **ReadOnly** attribute MUST NOT be present.

**Sortable:** Specifies whether the resulting data from this **Field** can be sorted or not. It MUST be set to "FALSE" if the **Type** attribute equals "Note". Otherwise, this attribute MUST NOT be specified.

**Type:** Specifies the data type of the **Field**.

**Viewable:** Specifies whether this **Field** is added to the default view. "TRUE" or "true" adds this **Field** to the default view, while "FALSE" or "false" does not. If the **Type** attribute is "ProgID", "Link" or "Signature", it MUST be set to "FALSE". Otherwise, it MUST NOT be specified.

**XName:** This MUST have the same value as the **Name** attribute.

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xs:element name="Field" type="pp:PropertyPromotionFieldType"/>
<xs:complexType name="PropertyPromotionFieldType">
  <xs:attribute name="Type" type="pp:FieldType" use="optional" default="Text"/>
  <xs:attribute name="ReadOnly" type="pp:TrueFalse" use="optional" default="FALSE"/>
  <xs:attribute name="Hidden" type="pp:TrueFalse" use="optional" default="FALSE"/>
  <xs:attribute name="Viewable" type="pp:TrueFalse" use="optional" default="TRUE"/>
  <xs:attribute name="PITarget" type="xs:string" use="optional"/>
  <xs:attribute name="PIAttribute" type="xs:string" use="optional"/>
  <xs:attribute name="Node" type="xs:string" use="optional"/>
  <xs:attribute name="DisplayName" type="xs:string" use="optional"/>
  <xs:attribute name="Name" type="xs:string" use="optional"/>
  <xs:attribute name="XName" type="xs:string" use="optional"/>
  <xs:attribute name="Aggregation" type="pp:Aggregation" use="optional"/>
  <xs:attribute name="Sortable" type="pp:TrueFalse" use="optional" default="TRUE"/>
  <xs:attribute name="Format" type="xs:string" use="optional"/>
  <xs:attribute name="MaxLength" type="xs:integer" use="optional"/>
</xs:complexType>
```

## 2.2.3 FieldType

This denotes the type of data in each [Field](#) element.

**Boolean:** Specified in [\[MS-WSSTS\]](#) section 2.3.1

**DateTime:** Specified in [\[MS-WSSTS\]](#) section 2.3.1

**Link:** This **FieldType** MUST be specified exactly once. This type is used to identify the **href** attribute within the XML processing instructions of a form file, as specified in section [2.1.1.1](#), that specifies the **URL** of the form template. This attribute will need to be adjusted if the URL of the form template is ever changed to ensure that the form file is still associated with the form template. It MUST be exactly as follows:

```
<Field Type="Link" Hidden="TRUE" Viewable="FALSE" PITarget="mso-infoPathSolution"
PIAttribute="href"/>
```

**Note:** Specified in [MS-WSSTS] section 2.3.1

**Number:** Specified in [MS-WSSTS] section 2.3.1

**ProgID:** This **FieldType** MUST be specified exactly once. The **Field** of this type is used to identify which application is used to open each form file in this document library. It MUST be written exactly as follows:

```
<Field Type="ProgID" ReadOnly="TRUE" Hidden="TRUE" Viewable="FALSE" PITarget="mso-
application" PIAttribute="progid"/>
```

**Signature:** This MUST NOT be written to the file.

**Text:** Specified in [MS-WSSTS] section 2.3.1

Referenced By
Field.properties@Type

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this simple type.

```
<xs:simpleType name="FieldType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Boolean"/>
    <xs:enumeration value="DateTime"/>
    <xs:enumeration value="Link"/>
    <xs:enumeration value="Note"/>
    <xs:enumeration value="Number"/>
    <xs:enumeration value="ProgID"/>
    <xs:enumeration value="Signature"/>
    <xs:enumeration value="Text"/>
  </xs:restriction>
</xs:simpleType>
```

## 2.2.4 Aggregation

A **Field** (section [2.2.2](#)) element MUST produce a single value, so a collection of values MUST be consolidated into a single value. This simple type is used to describe how to process a repeating field or a rich text box control, as specified in [\[MS-IPFF2\]](#), section 2.3.1.13.

**average:** Specified in the "average" value for the **aggregation** attribute of the **Field** element in [MS-IPFF2], section 2.2.1.2.52.

**count:** Specified in the "count" value for the **aggregation** attribute of the **Field** element in [MS-IPFF2], section 2.2.1.2.52.

**first:** Specified in the "first" value for the **aggregation** attribute of the **Field** element in [MS-IPFF2], section 2.2.1.2.52.

**last:** Specified in the "last" value for the **aggregation** attribute of the **Field** element in [MS-IPFF2], section 2.2.1.2.52.

**max:** Specified in the "max" value for the **aggregation** attribute of the **Field** element in [MS-IPFF2], section 2.2.1.2.52.

**merge:** Specified in the "merge" value for the **aggregation** attribute of the **Field** element in [MS-IPFF2], section 2.2.1.2.52.

**min:** Specified in the "min" value for the **aggregation** attribute of the **Field** element in [MS-IPFF2], section 2.2.1.2.52.

**plainText:** Specified in the "plainText" value for the **aggregation** attribute of the **Field** element in [MS-IPFF2], section 2.2.1.2.52.

**sum:** Specified in the "sum" value for the **aggregation** attribute of the **Field** element in [MS-IPFF2], section 2.2.1.2.52.

Referenced By
Field.properties@Aggregation

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this simple type.

```
<xs:simpleType name="Aggregation">
  <xs:restriction base="xs:string">
    <xs:enumeration value="average"/>
    <xs:enumeration value="count"/>
    <xs:enumeration value="first"/>
    <xs:enumeration value="last"/>
    <xs:enumeration value="max"/>
    <xs:enumeration value="merge"/>
    <xs:enumeration value="min"/>
    <xs:enumeration value="plainText"/>
    <xs:enumeration value="sum"/>
  </xs:restriction>
</xs:simpleType>
```

## 2.2.5 TrueFalse

This is a Boolean representation which **MUST** be one of the following values: TRUE, true, FALSE or false.

**false:** Boolean value for false.

**FALSE:** Boolean value for false.

**true:** Boolean value for true.

**TRUE:** Boolean value for true.

Referenced By
<a href="#">Field.properties@Hidden</a>
Field.properties@ReadOnly
Field.properties@Sortable
Field.properties@Viewable

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this simple type.

```

<xs:simpleType name="TrueFalse">
  <xs:restriction base="xs:string">
    <xs:enumeration value="TRUE"/>
    <xs:enumeration value="FALSE"/>
    <xs:enumeration value="true"/>
    <xs:enumeration value="false"/>
  </xs:restriction>
</xs:simpleType>

```

## 3 Structure Examples

The following sections provide examples for the structures specified in this document.

Examples for the **InfoPath Form File Format** are provided in section [3.1](#), with sections [3.1.1](#), [3.1.2](#) and [3.1.3](#) covering the XML processing instructions, the digital signature property structure, and the file attachment data format respectively.

Examples for the **InfoPath Property Promotion Format** are provided in section [3.2](#).

### 3.1 The InfoPath XML File

Following is a sample XML Schema Document (XSD). This file is described in [\[MS-IPFF2\]](#) section 2.3.

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<xsd:schema
  targetNamespace="http://schemas.microsoft.com/office/infopath/2003/myXSD/2008-0303T22:25:25"
  xmlns:my="http://schemas.microsoft.com/office/infopath/2003/myXSD/2008-03-03T22:25:25"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <xsd:element name="myFields">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element ref="my:field1" minOccurs="0"/>
        <xsd:element ref="my:group1" minOccurs="0"/>
      </xsd:sequence>
      <xsd:anyAttribute
        processContents="lax"
        namespace="http://www.w3.org/XML/1998/namespace"/>
      </xsd:complexType>
    </xsd:element>
    <xsd:element name="field1" type="xsd:string"/>
    <xsd:element name="group1">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element
            ref="my:group2"
            minOccurs="0"
            maxOccurs="unbounded"/>
          </xsd:sequence>
        </xsd:complexType>
      </xsd:element>
      <xsd:element name="group2">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element ref="my:field2" minOccurs="0"/>
            <xsd:element ref="my:field3" minOccurs="0"/>
          </xsd:sequence>
        </xsd:complexType>
      </xsd:element>
      <xsd:element name="field2" nillable="true" type="xsd:date"/>
      <xsd:element name="field3" nillable="true" type="xsd:boolean"/>
    </xsd:element>
  </xsd:schema>
```

A sample form file based on the preceding XML Schema Document (XSD) is:

```
<?xml version="1.0" encoding="UTF-8"?>
<?mso-infoPathSolution
  solutionVersion="1.0.0.143"
  productVersion="12.0.0"
  PIVersion="1.0.0.0"
  href="http://server/TestLibrary/Forms/template.xsn"
  name="urn:schemas-microsoft-com:office:infopath:NickTest:-myXSD-2008-03-03T22-25-25" ?>
<?mso-application
  progid="InfoPath.Document"
  versionProgid="InfoPath.Document.2"?>
<my:myFields
```

```

xmlns:my="http://schemas.microsoft.com/office/infopath/2003/myXSD/2008-03-03T22:25:25"
xml:lang="en-us">

<my:field1>A1</my:field1>
<my:group1>
  <my:group2>
    <my:field2 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">2009-01-01</my:field2>
    <my:field3>true</my:field3>
  </my:group2>
  <my:group2>
    <my:field2>2009-01-31</my:field2>
    <my:field3>false</my:field3>
  </my:group2>
</my:group1>
</my:myFields>

```

This form file has the following parts:

- **Processing instructions:** As specified in section [2.1.1](#), the processing instructions specify how to open and interpret the data within the file. A detailed example of Processing Instructions can be found in section [3.1.1](#).
- **XML data:** The data here conforms to the [MS-IPFF2] section 2.3. The form file shown here has a text box control, as specified in [MS-IPFF2] section 2.3.1.16, a repeating section control, as specified in [MS-IPFF2] section 2.3.1.11, containing a date picker control, as specified in [MS-IPFF2] section 2.3.1.4, and a check box control, as specified in [MS-IPFF2] section 2.3.1.2.

### 3.1.1 InfoPath XML Processing Instructions

Following is an example form file.

```

<?mso-infoPathSolution
name="urn:schemas-microsoft-com:office:infopath:1:-myXSD-2008-03-03T21-42-39"
solutionVersion="1.0.0.7"
productVersion="12.0.0.0"
PIVersion="1.0.0.0"
initialView="View 3"
language="en-us"
href="http://server/library/Forms/template.xsn"?>
<?mso-application
progid="InfoPath.Document"
versionProgid="InfoPath.Document.2"?>
<?mso-infoPath-file-attachment-present?>

<my:myFields
xmlns:my="http://schemas.microsoft.com/office/infopath/2003/myXSD/2008-03-03T21:42:39"
xml:lang="en-us">
<my:field1>Contoso</my:field1>
<my:field2
xsi:nil="true"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
</my:field2>
</my:myFields>

```

The following subsections describe the three XML processing instruction tags used in this example.

#### 3.1.1.1 mso-infoPathSolution

The following table lists the elements for an **mso-infoPathSolution**.

Element name	Value	Notes
<b>name</b>	urn:schemas-microsoft-com:office:infopath:1:-myXSD-2008-03-03T21-42-39	This is the name of the form template.
<b>solutionVersion</b>	1.0.0.7	The version of the form template that created this file was 1.0.0.7.
<b>productVersion</b>	12.0.0.0	The version of the product that created this form template was 12.0.0.0.
<b>PIVersion</b>	1.0.0.0	The version of these PI tags is 1.0.0.0.
<b>initialView</b>	View 3	The first view to show when loading this form file is View 3.
<b>language</b>	en-us	The locale of the form is en-us.
<b>href</b>	http://server/library/Forms/template.xsn	The file location of the form template.

### 3.1.1.2 mso-application

The following table lists the elements for an **mso-application**.

Element name	Value	Notes
<b>progid</b>	InfoPath.Document	Identifies this file as a form file with the value "InfoPath.Document".
<b>versionProgid</b>	InfoPath.Document.2	Specifies the version of the product that created this form file with the value "InfoPath.Document.2".

### 3.1.1.3 mso-infoPath-file-attachment-present

The XML processing instruction tag is included because a file attachment control, as described in [\[MS-IPFF2\]](#) section 2.3.1.7, is present in the form template from which the form file containing these XML processing instruction tags is derived.

## 3.1.2 Digital Signature Property Structure

The following examples demonstrate the relationship between data in XML digital signature property structures, as described in [\[XMLDSig\]](#), and computer settings at the time signing operations were performed.

### 3.1.2.1 Client Digital Signature Property Structure

XML digital signature property information for a signature performed on a client computer (for readability purposes, omissions are marked by ellipsis):

```
<SignatureProperty ... >
  <Comment></Comment>
  <NonRepudiation>
```

```

<UntrustedSystemDateTime>2008-02-10T09:41:29Z</UntrustedSystemDateTime>
  <SystemInformation>
    <OperatingSystem>5.1</OperatingSystem>
    <Office>12.0</Office>
    <InfoPath>12.0</InfoPath>
  </SystemInformation>
  <ScreenInformation>
    <NrOfMonitors>1</NrOfMonitors>
    <PrimaryMonitor>
      <Width Unit="px">1600</Width>
      <Height Unit="px">1200</Height>
      <ColorDepth Unit="bpp">32</ColorDepth>
    </PrimaryMonitor>
  </ScreenInformation>
  <SolutionInformation>
    <SolutionFingerprint></SolutionFingerprint>
    <CurrentView>View 1</CurrentView>
  </SolutionInformation>
  <ScreenDumpPNG> ... </ScreenDumpPNG>
  <ValidSignedImage> ... </ValidSignedImage>
  <InvalidSignedImage> ... </InvalidSignedImage>
  </NonRepudiation>
</SignatureProperty>

```

The following table provides more information about element values in the preceding sample XML digital signature property structure:

Element name	Value	Notes
Comment		There was no comment provided by the user for the signature.
UntrustedSystemDateTime	2008-02-10T09:41:29Z	The client computer's date and time was: February 10th 2008 at 9:41:29 am <b>UTC</b> .
OperatingSystem	5.1	The client computer's operating system version was: 5.1
Office	12.0	The client computer's mso.dll version was: 12.0
InfoPath	12.0	The client computer's ipeditor.dll version was: 12.0
NrOfMonitors	1	There was one monitor enabled on the client computer's operating system.
Width (Unit="px") Height (Unit="px") ColorDepth (Unit="bpp")	1600 1200 32	The client computers primary monitor's screen resolution was: 1600 by 1200 pixels with a color quality of 32 bits per pixel.
SolutionFingerprint		No value for this field means the form template's size was greater than 2 megabytes (see section <a href="#">2.1.2.18</a> SolutionFingerprint).
CurrentView	View 1	The active view name at the time of signing was: View 1

### 3.1.2.2 Server Digital Signature Property Structure

XML digital signature property information for a signature performed by the form server in the Web browser (for readability purposes, omissions are marked by ellipsis):

```
<SignatureProperty ...>
  <Comment>Sample signature comment</Comment>
  <NonRepudiation>
    <UntrustedSystemDateTime>2008-02-06T11:17:55Z</UntrustedSystemDateTime>
    <SystemInformation>
      <OperatingSystem>5.1</OperatingSystem>
      <Office>(N/A)</Office>
      <InfoPath>(N/A)</InfoPath>
      <ServerVersion>12</ServerVersion>
      <Browser>Microsoft Internet Explorer 7.0</Browser>
      <SigningControl>12</SigningControl>
    </SystemInformation>
    <ScreenInformation>
      <NrOfMonitors>1</NrOfMonitors>
      <PrimaryMonitor>
        <Width Unit="px">1520</Width>
        <Height Unit="px">1162</Height>
        <ColorDepth Unit="bpp">16</ColorDepth>
      </PrimaryMonitor>
    </ScreenInformation>
    <SolutionInformation>
      <SolutionFingerprint>f8284351dbc9eb1440e9751658a4e2e0</SolutionFingerprint>
      <CurrentView>View 1</CurrentView>
    </SolutionInformation>
    <ScreenDumpPNG> ... </ScreenDumpPNG>
  </NonRepudiation>
</SignatureProperty>
```

The following table provides more information about element values in the preceding sample XML digital signature property structure:

Element name	Value	Notes
Comment	Sample signature comment	This is the comment provided by the user for the signature.
UntrustedSystemDateTime	2008-02-06T11:17:55Z	The client computer's date and time was: February 6th 2008 at 11:17:55 am <b>UTC</b> .
OperatingSystem	5.1	The client computer's operating system version was: 5.1
Office	(N/A)	The form server signing the form in the Web browser does not retrieve information for the client computer's version of mso.dll.
InfoPath	(N/A)	The form server signing the form in the Web browser does not retrieve information for the client computer's version of ipeditor.dll.
ServerVersion	12	The version of the form server rendering the form template: 12.
Browser	Microsoft Internet Explorer 7.0	The name of the Web browser used to perform the signing operation was: Microsoft Internet Explorer 7.0

Element name	Value	Notes
SigningControl	12	The version of the control used by the form server to sign the form in the Web browser was: 12.
NrOfMonitors	1	There was one monitor enabled on the client computer's operating system.
Width (Unit="px") Height (Unit="px") ColorDepth (Unit="bpp")	1520 1162 16	The client computers primary monitor's screen resolution was: 1520 by 1162 pixels with a color quality of 16 bits per pixel.
SolutionFingerprint	f8284351dbc9eb1440e9751658a4e2e0	A hash of the form template was created and stored as this value.
CurrentView	View 1	The active view name at the time of signing was: View 1

### 3.1.3 File Attachment Data Format

The following example demonstrates the relationship between the Base64 encoded file attachment content and the file attachment structure.

Base64 encoded file attachment content:

```
x0lGQRQAAAABAAAAAAAAAAAAAAMAAAKAAAARgBpAGwAZQAxAC4AdAB4AHQAAABhYmM=
```

File attachment content (47 bytes with values in hexadecimal):

```
c7 49 46 41 14 00 00 00 01 00 00 00 00 00 00 00 03 00 00 00 0a 00 00 00 46 00 69 00 6c 00 65
00 31 00 2e 00 74 00 78 00 74 00 00 00 61 62 63
```

The following table shows the relationship between bytes in the decoded file attachment content and fields in the file attachment structure.

Bytes				Field	Notes
c7	49	46	41	file attachment signature (4 bytes)	Signature matches the file attachment signature specified in section 2.1.
14	00	00	00	header size (4 bytes)	Specifies that the size of the header is 20 (14 in hexadecimal) bytes.
01	00	00	00	version information (4 bytes)	Specifies that the version information is 1.
00	00	00	00	reserved space (4 bytes)	Reserved space with all zeros.
03	00	00	00	file size (4 bytes)	Specifies that the number of file bytes is 3 (see <b>file bytes</b> field later in this table).
0a	00	00	00	file name length (4 bytes)	Specifies that the length of the file name is 10 (0a in hexadecimal). As specified in <a href="#">2.1.3</a> , the total number of bytes used to store the file name is 20 bytes. (2 bytes per

Bytes				Field	Notes
					character in the file name. See <b>file name buffer</b> fields later in this table.)
46	00	69	00	file name buffer (variable)	First set of 2 UNICODE UTF-16 characters of the file name buffer. The first letter is "F" (the first 2 bytes maps to "F" in UNICODE UTF-16). The second letter is "i" (the last 2 bytes maps to "i" in UNICODE UTF-16).
6c	00	65	00	file name buffer (continued)	Second set of 2 UNICODE UTF-16 characters of the file name buffer. The first letter is "l" (the first 2 bytes maps to "l" in UNICODE UTF-16). The second letter is "e" (the last 2 bytes maps to "e" in UNICODE UTF-16).
31	00	2e	00	file name buffer (continued)	Third set of 2 UNICODE UTF-16 characters of the file name buffer. The first letter is "l" (the first 2 bytes maps to "l" in UNICODE UTF-16). The second letter is "." (the last 2 bytes maps to "." in UNICODE UTF-16).
74	00	78	00	file name buffer (continued)	Fourth set of 2 UNICODE UTF-16 characters of the file name buffer. The first letter is "t" (the first 2 bytes maps to "t" in UNICODE UTF-16). The second letter is "x" (the last 2 bytes maps to "x" in UNICODE UTF-16).
74	00	00	00	file name buffer (continued)	Fifth set of 2 UNICODE UTF-16 characters of the file name buffer. The first letter is "t" (the first 2 bytes maps to "t" in UNICODE UTF-16). The final two bytes in the file name buffer are zeros because they are the zero in the zero terminated string.
61	62	63		file bytes (variable)	Given the file name of "File1.txt", it is known that the file is a text file. Therefore, this specifies that the contents of the file bytes is "abc".

By analyzing the bytes of the Base64 decoded file attachment content it can be determined that:

1. File attachment signature (bytes 1-4)
2. Header size is 20 bytes (bytes 5-8)
3. Version information is 1 (bytes 9-12)
4. Reserved space is 0 (bytes 13-16)
5. File size is 3 bytes (bytes 17-20)
6. File name length is 10 (bytes 21-24)
7. File name buffer contains "File1.txt" with a terminating zero (bytes 25-44)
8. File data contains "abc" (bytes 45-17)

### 3.1.4 Embedded Picture Data Format

The following example demonstrates the Base64 encoded content of an embedded picture.

Base64 encoded embedded picture:

```
iVBORw0KGgoAAAANSUhEUgAAAAIAAAACCAIAAAD91JpZAAAAAXNSR0IArs4c6QAAAAARnQU1BAACxjwv8YQUAAAgY0hST
QAAeiYAAICEAAD6AAAAgOgAAHUwAADqYAAAOpgAABdwnLpRPAAAAAtJREFUGFdjYEAGAAAOAAAF5GhDfAAAAAE1FTkSuQm
CC
```

Picture content in its original 24 bit PNG format (141 bytes with values in hexadecimal):

```

89 50 4E 47 0D 0A 1A 0A 00 00 00 0D 49 48 44 52 00 00 00 02 00 00 00 02 08 02 00 00 00 FD D4
9A 73 00 00 00 01 73 52 47 42 00 AE CE 1C E9 00 00 00 04 67 41 4D 41 00 00 B1 8F 0B FC 61 05
00 00 00 20 63 48 52 4D 00 00 7A 26 00 00 80 84 00 00 FA 00 00 00 80 E8 00 00 75 30 00 00 EA
60 00 00 3A 98 00 00 17 70 9C BA 51 3C 00 00 00 0B 49 44 41 54 18 57 63 60 40 06 00 00 0E 00
01 79 1A 10 DF 00 00 00 00 49 45 4E 44 AE 42 60 82

```

These bytes represent a black 2x2 pixel picture in 24 bit PNG format.

## 3.2 The InfoPath Property Promotion (XFP) Format

The following example is a sample properties.xfp file from an expense report form. Report Date is a date field (no time), Expense code is a normal text field, and Total Item Cost is the sum of the repeating fields at /my:expenseReport/my:items/my:item/my:amount. Also, note that because this entire form can be digitally signed, a **Field** (section [2.2.2](#)) element of **type** "Signature" is defined with the location of the signatures.

```

<Fields FormAggregation="TRUE"
  xmlns:xsf="http://schemas.microsoft.com/office/infopath/2003/solutionDefinition">
  <Field Type="ProgID"
    ReadOnly="TRUE"
    Hidden="TRUE"
    Viewable="FALSE"
    PITarget="mso-application"
    PIAttribute="progid"/>
  <Field Type="Link"
    Hidden="TRUE"
    Viewable="FALSE"
    PITarget="mso-infopathSolution"
    PIAttribute="href"/>
  <Field Type="Signature"
    ReadOnly="TRUE"
    Hidden="TRUE"
    Viewable="FALSE"
    Node="/my:expenseReport /my:signatures1"/>
  <Field ReadOnly="TRUE"
    DisplayName="Report Date"
    Name="{C7A91081-0DAC-49E1-B831-1EDFEABE87F6}"
    XName="{C7A91081-0DAC-49E1-B831-1EDFEABE87F6}"
    Node="/my:expenseReport/my:reportDate"
    Type="DateTime"
    Format="DateOnly"/>
  <Field ReadOnly="TRUE"
    DisplayName="Total Item Cost"
    Name="{360FD50E-E6A2-4A23-AEF7-72AAC2A544A9}"
    XName="{360FD50E-E6A2-4A23-AEF7-72AAC2A544A9}"
    Node="/my:expenseReport/my:items/my:item/my:amount"
    Aggregation="sum"
    Type="Number"/>
</Fields>

```

Element name	Value	Notes
Type	ProgID	The data type for this <b>Field</b> is ProgID
ReadOnly	TRUE	This <b>Field</b> cannot be modified inside of the document library.
Hidden	TRUE	This <b>Field</b> is not accessible from the UI.
Viewable	FALSE	This <b>Field</b> is not added to the form view by default.
PITarget	mso-application	The application to open each form file is

Element name	Value	Notes
		found in the mso-application PI tag on each form file
PIAttribute	progid	The application to open each form file is specified using the mso-application PI tag on the progid attribute on each form file
Type	Link	The data type for this <b>Field</b> is Link
Hidden	TRUE	This <b>Field</b> is not accessible from the UI.
Viewable	FALSE	This <b>Field</b> is not added to the form view by default.
PITarget	mso-infoPathSolution	If this document library is migrated, then the mso-infoPathSolution PI tag of each form file needs to be updated.
PIAttribute	href	If this document library is migrated, then the href attribute of the mso-infoPathSolution PI tag of each form file needs to be updated.
Type	Signature	The data type for this <b>Field</b> is Signature
ReadOnly	TRUE	This <b>Field</b> cannot be modified inside of the document library.
Hidden	TRUE	This <b>Field</b> is not accessible from the UI.
Viewable	FALSE	This <b>Field</b> is not added to the form view by default.
Node	/my:expenseReport /my:signatures1	The XPath to the field containing the digital signature information.
ReadOnly	TRUE	This <b>Field</b> cannot be modified inside of the document library.
DisplayName	Report Date	The name shown to the user is: Report Date
Name	{C7A91081-0DAC-49E1-B831-1EDFEABE87F6}	Internal name of this <b>Field</b> .
XName	{C7A91081-0DAC-49E1-B831-1EDFEABE87F6}	Internal name of this <b>Field</b> .
Node	/my:expenseReport/my:reportDate	XPath to the field whose value is shown to the user.
Type	DateTime	The data type for this <b>Field</b> is DateTime
Format	DateOnly	Only the date (without the time) will be displayed.
ReadOnly	TRUE	This <b>Field</b> cannot be modified inside of the document library.
DisplayName	Total Item Cost	The name shown to the user is: Total Item Cost
Name	{360FD50E-E6A2-4A23-AEF7-72AAC2A544A9}	Internal name of this <b>Field</b> .
XName	{360FD50E-E6A2-4A23-AEF7-72AAC2A544A9}	Internal name of this <b>Field</b> .
Node	/my:expenseReport/my:items/my:item/my:amount	XPath to the field whose value is shown to the user.
Aggregation	sum	The values from this field in a repeating table control will be summed.
Type	Number	The data type for this <b>Field</b> is Number.

## 4 Security

### 4.1 Security Considerations for Implementers

The following sections describe aspects of this file format that relate to security.

#### 4.1.1 Digital Signature Property Structure

The intent of the XML digital signature property structure is to capture a reasonable amount of non-trusted information regarding the digital signature and the system on which the digital signature was created. This information is intended to be reasonable proof that the user who applied the signature truly was able to view exactly what was signed.

#### 4.1.2 File Attachment Data Format

This XML processing instruction is added as a convenience for InfoPath but is not meant to be a security feature. If this XML processing instruction is removed, when users fill out the form, all file attachment controls will be disabled, as described in [\[MSDN-AFI\]](#).

The file attachment control is described in [\[MS-IPFF2\]](#) section 2.3.1.7.

### 4.2 Index of Security Fields

None.

## 5 Appendix A: Full XML Schemas

For ease of implementation, this section provides the full XML schemas for the XML digital signature property structure and the InfoPath Property Promotion (XFP) format.

### 5.1 Digital Signature Property Structure

The XML digital signature property structure specified in section [2.1.2](#) adheres to the following XML schema:

```
<?xml version="1.0" encoding="utf-8"?>
<xsd:schema
  targetNamespace="http://schemas.microsoft.com/office/infopath/2003/SignatureProperties"
  xmlns:sp="http://schemas.microsoft.com/office/infopath/2003/SignatureProperties"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified">

  <xsd:element name="Comment" type="xsd:string"/>

  <xsd:element name="NonRepudiation">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element ref="sp:UntrustedSystemDateTime" minOccurs="1"/>
        <xsd:element ref="sp:SystemInformation" minOccurs="1"/>
        <xsd:element ref="sp:ScreenInformation" minOccurs="1"/>
        <xsd:element ref="sp:SolutionInformation" minOccurs="1"/>
        <xsd:element ref="sp:ScreenDumpPNG" minOccurs="1"/>
        <xsd:choice minOccurs="0" maxOccurs="1">
          <xsd:element ref="sp:SignatureText" minOccurs="0"/>
          <xsd:element ref="sp:SignatureImage" minOccurs="0"/>
        </xsd:choice>
        <xsd:element ref="sp:ValidSignedImage" minOccurs="0"/>
        <xsd:element ref="sp:InvalidSignedImage" minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>

  <xsd:element name="UntrustedSystemDateTime" type="xsd:dateTime"/>

  <xsd:element name="SystemInformation">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element ref="sp:OperatingSystem" minOccurs="1"/>
        <xsd:element ref="sp:Office" minOccurs="1"/>
        <xsd:element ref="sp:InfoPath" minOccurs="1"/>
        <xsd:element ref="sp:ServerVersion" minOccurs="0"/>
        <xsd:element ref="sp:Browser" minOccurs="0"/>
        <xsd:element ref="sp:SigningControl" minOccurs="0"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>

  <xsd:element name="OperatingSystem" type="xsd:decimal"/>

  <xsd:element name="Office">
    <xsd:simpleType>
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="12.0"/>
        <xsd:enumeration value="14.0"/>
        <xsd:enumeration value="15.0"/>
        <xsd:enumeration value="(N/A)"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:element>

  <xsd:element name="InfoPath">
    <xsd:simpleType>
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="12.0"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:element>

</xsd:schema>
```

```

        <xsd:enumeration value="14.0"/>
        <xsd:enumeration value="15.0"/>
        <xsd:enumeration value="(N/A)"/>
    </xsd:restriction>
</xsd:simpleType>
</xsd:element>

<xsd:element name="ServerVersion">
    <xsd:simpleType>
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="12"/>
            <xsd:enumeration value="14"/>
            <xsd:enumeration value="15"/>
        </xsd:restriction>
    </xsd:simpleType>
</xsd:element>

<xsd:element name="Browser" type="xsd:string"/>

<xsd:element name="SigningControl">
    <xsd:simpleType>
        <xsd:restriction base="xsd:string">
            <xsd:enumeration value="12"/>
            <xsd:enumeration value="14"/>
            <xsd:enumeration value="15"/>
        </xsd:restriction>
    </xsd:simpleType>
</xsd:element>

<xsd:element name="ScreenInformation">
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element ref="sp:NrOfMonitors" minOccurs="1"/>
            <xsd:element ref="sp:PrimaryMonitor" minOccurs="1"/>
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>

<xsd:element name="NrOfMonitors" type="xsd:integer"/>

<xsd:element name="PrimaryMonitor">
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element ref="sp:Width" minOccurs="1"/>
            <xsd:element ref="sp:Height" minOccurs="1"/>
            <xsd:element ref="sp:ColorDepth" minOccurs="1"/>
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>

<xsd:element name="Width">
    <xsd:complexType>
        <xsd:simpleContent>
            <xsd:extension base="xsd:integer">
                <xsd:attribute name="Unit">
                    <xsd:simpleType>
                        <xsd:restriction base="xsd:string">
                            <xsd:enumeration value="px"/>
                        </xsd:restriction>
                    </xsd:simpleType>
                </xsd:attribute>
            </xsd:extension>
        </xsd:simpleContent>
    </xsd:complexType>
</xsd:element>

<xsd:element name="Height">
    <xsd:complexType>
        <xsd:simpleContent>

```

```

    <xsd:extension base="xsd:integer">
      <xsd:attribute name="Unit">
        <xsd:simpleType>
          <xsd:restriction base="xsd:string">
            <xsd:enumeration value="px"/>
          </xsd:restriction>
        </xsd:simpleType>
      </xsd:attribute>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
</xsd:element>

<xsd:element name="ColorDepth">
  <xsd:complexType>
    <xsd:simpleContent>
      <xsd:extension base="xsd:integer">
        <xsd:attribute name="Unit">
          <xsd:simpleType>
            <xsd:restriction base="xsd:string">
              <xsd:enumeration value="bpp"/>
            </xsd:restriction>
          </xsd:simpleType>
        </xsd:attribute>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
</xsd:element>

<xsd:element name="SolutionInformation">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="sp:SolutionFingerprint" minOccurs="1"/>
      <xsd:element ref="sp:CurrentView" minOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="SolutionFingerprint" type="xsd:string"/>
<xsd:element name="CurrentView" type="xsd:string"/>
<xsd:element name="ScreenDumpPNG" type="xsd:base64Binary"/>
<xsd:element name="SignatureText" type="xsd:string"/>
<xsd:element name="SignatureImage" type="xsd:base64Binary"/>
<xsd:element name="ValidSignedImage" type="xsd:base64Binary"/>
<xsd:element name="InvalidSignedImage" type="xsd:base64Binary"/>
</xsd:schema>

```

## 5.2 The InfoPath Property Promotion (XFP) Format

Following is the XSD schema for XFP files:

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns="" xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:pp="http://schemas.microsoft.com/office/infopath/2003/propertyPromotion"
  targetNamespace="http://schemas.microsoft.com/office/infopath/2003/propertyPromotion"
  xmlns:msdata="urn:schemas-microsoft-com:xml-msdata">

  <xs:element name="Fields" type="pp:FieldCollectionType">
    </xs:element>

  <xs:complexType name="FieldCollectionType">

```

```

    <xs:sequence>
      <xs:element ref="pp:Field" minOccurs="0" maxOccurs="unbounded" />
    </xs:sequence>
    <xs:attribute name="FormAggregation" type="xs:string" />
  </xs:complexType>

  <xs:element name="Field" type="pp:PropertyPromotionFieldType" />

  <xs:complexType name="PropertyPromotionFieldType">
    <xs:attribute name="Type" type="pp:FieldType" use="optional" />
    <xs:attribute name="ReadOnly" type="pp:TrueFalse" use="optional" />
    <xs:attribute name="Hidden" type="pp:TrueFalse" use="optional" />
    <xs:attribute name="Viewable" type="pp:TrueFalse" use="optional" />
    <xs:attribute name="PITarget" type="xs:string" use="optional" />
    <xs:attribute name="PIAttribute" type="xs:string" use="optional" />
    <xs:attribute name="Node" type="xs:string" use="optional" />
    <xs:attribute name="DisplayName" type="xs:string" use="optional" />
    <xs:attribute name="Name" type="xs:string" use="optional" />
    <xs:attribute name="XName" type="xs:string" use="optional" />
    <xs:attribute name="Aggregation" type="pp:Aggregation" use="optional" />
    <xs:attribute name="Sortable" type="pp:TrueFalse" use="optional" />
    <xs:attribute name="Format" type="xs:string" use="optional" />
    <xs:attribute name="MaxLength" type="xs:integer" use="optional" />
  </xs:complexType>

  <xs:simpleType name="FieldType">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Boolean" />
      <xs:enumeration value="DateTime" />
      <xs:enumeration value="Link" />
      <xs:enumeration value="Note" />
      <xs:enumeration value="Number" />
      <xs:enumeration value="ProgID" />
      <xs:enumeration value="Signature" />
      <xs:enumeration value="Text" />
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="Aggregation">
    <xs:restriction base="xs:string">
      <xs:enumeration value="average" />
      <xs:enumeration value="count" />
      <xs:enumeration value="first" />
      <xs:enumeration value="last" />
      <xs:enumeration value="max" />
      <xs:enumeration value="merge" />
      <xs:enumeration value="min" />
      <xs:enumeration value="plainText" />
      <xs:enumeration value="sum" />
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="TrueFalse">
    <xs:restriction base="xs:string">
      <xs:enumeration value="TRUE" />
      <xs:enumeration value="FALSE" />
      <xs:enumeration value="true" />
      <xs:enumeration value="false" />
    </xs:restriction>
  </xs:simpleType>
</xs:schema>

```

## 6 Appendix B: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include updates to those products.

- Microsoft Office Forms Server 2007
- Microsoft Office InfoPath 2007
- Microsoft InfoPath 2010
- Microsoft InfoPath 2013
- the 2007 Microsoft Office system
- Microsoft Office SharePoint Server 2007
- Microsoft Office 2010 suites
- Microsoft SharePoint Server 2010
- Microsoft SharePoint Server 2013
- Microsoft SharePoint Server 2016
- Microsoft SharePoint Server 2019 Preview

Exceptions, if any, are noted in this section. If an update version, service pack or Knowledge Base (KB) number appears with a product name, the behavior changed in that update. The new behavior also applies to subsequent updates unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms "SHOULD" or "SHOULD NOT" implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term "MAY" implies that the product does not follow the prescription.

[<1> Section 2.1.1.1](#): "12.0.0" specifies that Office InfoPath 2007 was last used to modify this form. "14.0.0" specifies that Microsoft InfoPath 2010 was last used to modify this form. "15.0.0" specifies that InfoPath 2013 was last used to modify this form.

[<2> Section 2.1.2.6](#): Form was signed using the 2007 Office system.

[<3> Section 2.1.2.6](#): Form was signed using Office 2010.

[<4> Section 2.1.2.6](#): Form was signed using Microsoft Office 2013.

[<5> Section 2.1.2.7](#): Form was signed using Office InfoPath 2007

[<6> Section 2.1.2.7](#): Form was signed using InfoPath 2010

[<7> Section 2.1.2.7](#): Form was signed using InfoPath 2013

[<8> Section 2.1.4](#): The Embedded Picture Data Format applies to InfoPath 2010 only.

## 7 Change Tracking

This section identifies changes that were made to this document since the last release. Changes are classified as Major, Minor, or None.

The revision class **Major** means that the technical content in the document was significantly revised. Major changes affect protocol interoperability or implementation. Examples of major changes are:

- A document revision that incorporates changes to interoperability requirements.
- A document revision that captures changes to protocol functionality.

The revision class **Minor** means that the meaning of the technical content was clarified. Minor changes do not affect protocol interoperability or implementation. Examples of minor changes are updates to clarify ambiguity at the sentence, paragraph, or table level.

The revision class **None** means that no new technical changes were introduced. Minor editorial and formatting changes may have been made, but the relevant technical content is identical to the last released version.

The changes made to this document are listed in the following table. For more information, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com).

Section	Description	Revision class
<a href="#">6</a> Appendix B: Product Behavior	Updated list of supported products.	Major

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