

[MS-OSCO]:

Office Server ClickOnce Manifest Structure

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1 Introduction

This document specifies the Office Server ClickOnce Manifest Structure. This structure is used to package one or more customizations and their dependent components.

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:

add-in: Supplemental functionality that is provided by an external application or macro to extend the capabilities of an application.

application manifest: An **XML** file that describes the contents and requirements for a **deployment package**.

certification authority (CA): A third party that issues **public key** certificates. Certificates serve to bind public keys to a user identity. Each user and certification authority (CA) can decide whether to trust another user or CA for a specific purpose, and whether this trust should be transitive. For more information, see [\[RFC3280\]](#).

code access security permission set: A set of rules that are applied to an executable component to grant or restrict access to functionality and resources that are associated with that component.

deployment manifest: An **XML** file that describes the identity and version of a **deployment package**.

deployment package: A collection of files that can be used to deploy and manage customizations, such as **add-ins**, to a computer. It consists of an **application manifest**, a deployment manifest, and related package files.

digest: The fixed-length output string from a one-way hash function that takes a variable-length input string and is probabilistically unique for every different input string. Also, a cryptographic checksum of a data (octet) stream.

digital signature: A value that is generated by using a digital signature algorithm, taking as input a private key and an arbitrary-length string, such that a specific verification algorithm is satisfied by the value, the input string, and the public key corresponding to the input private key.

entry point: A starting address for an assembly that is written in the form NamespaceName.ClassName.

fully qualified class name: A class name that includes namespace information. Use of a fully qualified class name ensures that the class name is treated as unique.

hash: A fixed-size result that is obtained by applying a one-way mathematical function, which is sometimes referred to as a hash algorithm, to an arbitrary amount of data. If the input data changes, the hash also changes. The hash can be used in many operations, including authentication and digital signing.

locale: A collection of rules and data that are specific to a language and a geographical area. A locale can include information about sorting rules, date and time formatting, numeric and monetary conventions, and character classification.

package file: A file that is in a deployment package and is not a manifest file.

post-deployment action: A method that can run before or after deployment events.

public key: One of a pair of keys used in public-key cryptography. The public key is distributed freely and published as part of a digital certificate. For an introduction to this concept, see [\[CRYPTO\]](#) section 1.8 and [\[IEEE1363\]](#) section 3.1.

root element: The top-level element in an XML document. It contains all other elements and is not contained by any other element, as described in [\[XML\]](#).

strong name: A name that consists of the simple text name, version number, and culture information of an assembly, strengthened by a public key and a digital signature that is generated over the assembly.

time stamp authority: A service acknowledging that a datum existed before a specific time. The service is typically a trusted third party.

timestamp: A condition of a **digital signature** that indicates whether the signature was created with a valid certificate that has expired or was created with a certificate that had expired already. If the certificate expired after the signature was created, the signature can be trusted. If it expired before the signature was created, it cannot be trusted.

XML: The Extensible Markup Language, as described in [\[XML1.0\]](#).

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. We will assist you in finding the relevant information.

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1.3 Overview

This structure is used to create a **deployment package** for deploying one or more customizations and their related components to a computer.

A deployment package consists of a **deployment manifest** file (section [2.1](#)) and an **application manifest** file (section [2.2](#)). In addition to the manifest files, the deployment package also contains additional files as specified by the application manifest.

The deployment manifest file lists the identity and version of the deployment package. Contents of the deployment manifest also identify the publisher of the deployment package. The deployment manifest links to the application manifest for the deployment package.

The application manifest file lists the files associated with the deployment package and their relationship to the deployment package. The application manifest specifies run-time behavior about one or many customizations included in the deployment package. The application manifest describes the location of **package files** but does not describe the location to deploy the package files. An implementation of this structure can deploy package files to a temporary cache or provide the user with a choice of the final location.

1.4 Relationship to Protocols and Other Structures

The **XML** based structures in this document are defined according to the XML standard described in [\[XML\]](#).

The manifest files in this structure are signed using XML signature syntax and processing rules as described by [\[XMLDSig\]](#).

[\[MS-BCSDPFFS\]](#) section 1.3 is an example of an implementation that uses this structure.

1.5 Applicability Statement

This structure can be used to package and deploy one or more customizations. An implementation of this structure can package customizations dynamically and deploy them to a computer to customize applications running on the computer. This structure provides information necessary to successfully deploy a package and does not assure the functionality of the customizations present in the package.

1.6 Versioning and Localization

None.

1.7 Vendor-Extensible Fields

None.

2 Structures

In the following sections, the schema definition might differ from the processing rules imposed by the protocol. The XSD in this specification provides a base description of the file format. The text that introduces the XSD specifies additional restrictions that reflect protocol behavior. For example, the schema definition might allow for an element to be **empty**, **null**, or **not present** but the behavior of the protocol as specified restricts the same elements to being **non-empty**, **present**, and **not null**.

A **deployment package** specifies the location of **package files** for deployment. A deployment package **MUST** contain the following files:

- A **deployment manifest** file as specified in section [2.1](#) of this document.
- An **application manifest** file as specified in section [2.2](#) of this document.
- At least one package file.

2.1 Deployment Manifest

The **deployment manifest** is an **XML** file that specifies the identity and version information of the **deployment package**. The file name of the deployment manifest **MUST** end with ".vsto". The file size of the deployment manifest **MUST** be less than 16 megabytes. The **root element** of the deployment manifest **MUST** be **assembly** (section [2.1.1.1.1](#)).

2.1.1 Target namespace: urn:schemas-microsoft-com:asm.v1

2.1.1.1 Global Elements

2.1.1.1.1 assembly

Target namespace: urn:schemas-microsoft-com:asm.v1

An [assemblyType](#) element that specifies a deployment manifest.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="assembly" type="assemblyType"/>
```

2.1.1.2 Global Attributes

None.

2.1.1.3 Complex Types

2.1.1.3.1 assemblyIdentityType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyType](#)

The **assemblyIdentityType** complex type specifies an identifier for a **deployment package**.

Attributes:

name : A [fileNameStringType](#) attribute that specifies the name. The length of the string value MUST be less than 252 characters.

version : A [fourPartVersionType](#) attribute that specifies the version.

processorArchitecture : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the processor architecture.

publicKeyToken : A [publicKeyTokenType](#) attribute that specifies the last 8 bytes of the SHA-1 **hash** ([\[FIPS180-4\]](#) section 6.1) of the **public key** used to generate the **strong name** signature (section [2.3](#)) for the **deployment manifest** in accordance with section [2.5.2.1](#).

language : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the **locale**.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="assemblyIdentityType">
  <xs:attribute name="name" type="asm.v1:fileNameStringType" use="required"/>
  <xs:attribute name="version" type="asm.v1:fourPartVersionType" use="required"/>
  <xs:attribute name="processorArchitecture" type="xs:string" use="required" fixed="msil"/>
  <xs:attribute name="publicKeyToken" type="asm.v1:publicKeyTokenType" use="required"/>
  <xs:attribute name="language" type="xs:string" use="required" fixed="neutral"/>
</xs:complexType>
```

2.1.1.3.2 descriptionType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyType](#)

The **descriptionType** complex type specifies the description of a **deployment package**. The combined length of **publisher** and **product** attribute values MUST be less than 261 characters.

Attributes:

publisher : A [publisher](#) attribute that specifies the publisher name.

product : A [product](#) attribute that specifies the product name.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="descriptionType" mixed="true">
  <xs:attribute ref="asm.v2:publisher" use="required"/>
  <xs:attribute ref="asm.v2:product" use="required"/>
</xs:complexType>
```

2.1.1.3.3 assemblyType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assembly](#)

The **assemblyType** complex type specifies a **deployment manifest**.

Child Elements:

assemblyIdentity : An [assemblyIdentityType](#) element that specifies an identifier for the **deployment package**.

description : A [descriptionType](#) element that specifies the description.

deployment : A [deployment](#) element that specifies how files in the deployment package are stored.

compatibleFrameworks : A [compatibleFrameworks](#) element that specifies the framework versions on which this application can run.

dependency : A [dependency](#) element that specifies a dependency on an **application manifest** (section [2.2](#)).

publisherIdentity : A [publisherIdentity](#) element that specifies the publisher of a deployment package.

Signature : A [SignatureType](#) element that specifies the necessary information to validate a signed deployment manifest.

Attributes:

manifestVersion : A [twoPartVersionType](#) attribute that specifies the manifest version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="assemblyType">
  <xs:sequence>
    <xs:element name="assemblyIdentity" type="asm.v1:assemblyIdentityType"/>
    <xs:element name="description" type="descriptionType"/>
    <xs:element ref="asm.v2:deployment"/>
    <xs:element ref="clickonce.v2:compatibleFrameworks"/>
    <xs:element ref="asm.v2:dependency"/>
    <xs:element ref="asm.v2:publisherIdentity"/>
    <xs:element ref="ds:Signature"/>
  </xs:sequence>
  <xs:attribute name="manifestVersion" type="asm.v1:twoPartVersionType" use="required"
    fixed="1.0"/>
</xs:complexType>
```

2.1.1.4 Simple Types

2.1.1.4.1 twoPartVersionType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyType](#)

The **twoPartVersionType** simple type specifies a version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="twoPartVersionType">
  <xs:restriction base="xs:string">
    <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])"/>
  </xs:restriction>
</xs:simpleType>
```

2.1.1.4.2 publicKeyTokenType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyIdentityType](#)

The **publicKeyTokenType** simple type specifies the last 8 bytes of the SHA-1 **hash** as specified by [\[FIPS180-4\]](#) section 6.1 of a **public key** in accordance with section [2.5.2.1](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="publicKeyTokenType">
  <xs:restriction base="xs:string">
    <xs:pattern value="([0-9]|[a-f]|[A-F]){16}"/>
  </xs:restriction>
</xs:simpleType>
```

2.1.1.4.3 fourPartVersionType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyIdentityType](#)

The **fourPartVersionType** simple type specifies a version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="fourPartVersionType">
  <xs:restriction base="xs:string">
    <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5})"/>
  </xs:restriction>
</xs:simpleType>
```

2.1.1.4.4 fileNameStringType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyIdentityType](#)

The **fileNameStringType** simple type specifies a string for a file name.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="fileNameStringType">
  <xs:restriction base="xs:string">
    <xs:pattern value="([\u0020]|\u0021|\u0024|\u0025|[\u0027-\u0029]|\u002B-\u002E|[\u0030-\u0039]|\u003B|\u003D|[\u0040-\u005B]|\u005D-\u007B|[\u007D-\uFFFD]|\u10000-\u10FFFF)*"/>
  </xs:restriction>
</xs:simpleType>
```


2.1.2 Target Namespace urn:schemas-microsoft-com:asm.v2

2.1.2.1 Global Elements

2.1.2.1.1 deployment

Target namespace: urn:schemas-microsoft-com:asm.v2

A [deploymentType](#) element that specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="deployment" type="asm.v2:deploymentType"/>
```

2.1.2.1.2 dependency

Target namespace: urn:schemas-microsoft-com:asm.v2

A [dependencyType](#) element that specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="dependency" type="asm.v2:dependencyType"/>
```

2.1.2.1.3 publisherIdentity

Target namespace: urn:schemas-microsoft-com:asm.v2

A [publisherIdentityType](#) element that specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="publisherIdentity" type="asm.v2:publisherIdentityType"/>
```

2.1.2.2 Global Attributes

2.1.2.2.1 publisher

Target namespace: urn:schemas-microsoft-com:asm.v2

A [fileNameStringType](#) attribute that specifies the publisher name.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this attribute.

```
<xs:attribute name="publisher" type="asm.v2:fileNameStringType" fixed="DefaultPublisher"/>
```

2.1.2.2.2 product

Target namespace: urn:schemas-microsoft-com:asm.v2

A [fileNameStringType](#) attribute that specifies the product name.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this attribute.

```
<xs:attribute name="product" type="asm.v2:fileNameStringType"/>
```

2.1.2.3 Complex Types

2.1.2.3.1 deploymentType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [deployment](#)

The **deploymentType** complex type specifies how files in the **deployment package** are stored.

Attributes:

install : A boolean ([\[W3C-XSD\]](#) section 3.2.2) attribute that specifies a reserved value.

mapFileExtensions : A boolean ([\[W3C-XSD\]](#) section 3.2.2) attribute that specifies whether **package files** have the string ".deploy" appended to the end of the file name. For example: the package file "file.dll" would be stored as "file.dll.deploy" if the value is "true".

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="deploymentType">
  <xs:attribute name="install" type="xs:boolean" use="required" fixed="false"/>
  <xs:attribute name="mapFileExtensions" type="xs:boolean" use="optional" default="false"/>
</xs:complexType>
```

2.1.2.3.2 dependencyType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependency](#)

The **dependencyType** complex type specifies a container for a [dependentAssemblyType](#) element.

Child Elements:

dependentAssembly : A dependentAssemblyType element that specifies the **application manifest** (section [2.2](#)).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="dependencyType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="dependentAssembly" type="asm.v2:dependentAssemblyType"/>
    </xs:choice>
  </xs:sequence>
</xs:complexType>
```

2.1.2.3.3 dependentAssemblyType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependencyType](#)

The **dependentAssemblyType** complex type specifies an application manifest (section [2.2](#)).

Child Elements:

assemblyIdentity : An [assemblyIdentityType](#) element that specifies an identifier for the application manifest (section 2.2).

hash : A [hashType](#) element that specifies the **hash** of the application manifest (section 2.2).

Attributes:

dependencyType : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies a dependency on an application manifest (section 2.2).

codebase : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies a path to an application manifest (section 2.2).

size : An integer ([\[W3C-XSD\]](#) section 3.3.13) attribute that specifies the size of an application manifest (section 2.2) in bytes.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="dependentAssemblyType">
  <xs:sequence>
    <xs:element name="assemblyIdentity" type="asm.v2:assemblyIdentityType"/>
    <xs:element name="hash" type="asm.v2:hashType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="dependencyType" type="xs:string" use="required" fixed="install"/>
  <xs:attribute name="codebase" type="xs:anyURI"/>
  <xs:attribute name="size" type="xs:integer" use="optional"/>
</xs:complexType>
```

2.1.2.3.4 hashType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependentAssemblyType](#)

The **hashType** complex type specifies a **hash** of a file as specified by [\[XMLDSig\]](#) section 4.3.3.

The **Transforms** container element ([\[XMLDSig\]](#) section 4.3.3.4) MUST contain one **Transform** element. The value of the **Algorithm** attribute of the **Transform** element ([\[XMLDSig\]](#) section 4.3.3.4) MUST be "urn:schemas-microsoft-com:HashTransforms.Identity" (section [2.5.1](#)).

The value of the **Algorithm** attribute of the **DigestMethod** ([\[XMLDSig\]](#) section 4.3.3.5) MUST be "http://www.w3.org/2000/09/xmlsig#sha1".

All other attributes are ignored.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="hashType">
  <xs:complexContent>
    <xs:extension base="ds:ReferenceType">
      <xs:sequence>
```

```

        <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
    </xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>

```

2.1.2.3.5 assemblyIdentityType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependentAssemblyType](#)

The **assemblyIdentityType** complex type specifies an identifier of an **application manifest**.

Attributes:

name : A [fileNameStringType](#) attribute that specifies the name. The length of the string value MUST be less than 252 characters.

version : A [fourPartVersionType](#) attribute that specifies the version.

type : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the reserved value.

processorArchitecture : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the processor architecture.

publicKeyToken : A [publicKeyTokenType](#) attribute that specifies the last 8 bytes of the SHA-1 **hash** ([\[FIPS180-4\]](#) section 6.1) of the **public key** used to generate the strong name signature (section [2.3](#)) for the application manifest in accordance with section [2.5.2.1](#).

language : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the **locale**.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```

<xs:complexType name="assemblyIdentityType">
  <xs:attribute name="name" type="asm.v2:fileNameStringType" use="required"/>
  <xs:attribute name="version" type="asm.v2:fourPartVersionType" use="required"/>
  <xs:attribute name="type" type="xs:string" use="optional" fixed="win32"/>
  <xs:attribute name="processorArchitecture" type="xs:string" use="required" fixed="msil"/>
  <xs:attribute name="publicKeyToken" type="asm.v2:publicKeyTokenType" use="required"/>
  <xs:attribute name="language" type="xs:string" use="required" fixed="neutral"/>
</xs:complexType>

```

2.1.2.3.6 publisherIdentityType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [publisherIdentity](#)

The **publisherIdentityType** complex type specifies a publisher of a **deployment package**.

Attributes:

name : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the distinguished name of the publisher as specified in [\[RFC1779\]](#) section 2.3.

issuerKeyHash : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the SHA-1 **hash** ([\[FIPS180-4\]](#) section 6.1) of the **public key** in the certificate of the **certification authority (CA)**

that issued the publisher's certificate ([RFC3280]). The SHA-1 public key hash is computed over the value of the subjectPublicKey field in the subjectPublicKeyInfo field ([RFC3280] section 4.1). The tag and length MUST be excluded from the value before calculation.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="publisherIdentityType">
  <xs:attribute name="name" type="xs:string"/>
  <xs:attribute name="issuerKeyHash" type="xs:string"/>
</xs:complexType>
```

2.1.2.4 Simple Types

2.1.2.4.1 fourPartVersionType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [assemblyIdentityType](#)

The **fourPartVersionType** specifies a version number.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="fourPartVersionType">
  <xs:restriction base="xs:string">
    <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])"/>
  </xs:restriction>
</xs:simpleType>
```

2.1.2.4.2 fileNameStringType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [publisher](#), [product](#), [assemblyIdentityType](#)

The **fileNameStringType** simple type specifies a string for a file name.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="fileNameStringType">
  <xs:restriction base="xs:string">
    <xs:pattern value="([\u0020]|\u0021|\u0024|\u0025|\u0027-\u0029|\u002B-\u002E)|[\u0030-\u0039]|\u003B|\u003D|\u0040-\u005B|\u005D-\u007B)|[\u007D-\uFFFF]|\u10000-\u10FFFF)*"/>
  </xs:restriction>
</xs:simpleType>
```

2.1.2.4.3 publicKeyTokenType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [assemblyIdentityType](#)

The **publicKeyTokenType** simple type specifies the last 8 bytes of the SHA-1 **hash**, as specified by [\[FIPS180-4\]](#) section 6.1, of a **public key** in accordance with section [2.5.2.1](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="publicKeyTokenType">
  <xs:restriction base="xs:string">
    <xs:pattern value="([0-9]|[a-f]|[A-F]){16}" />
  </xs:restriction>
</xs:simpleType>
```

2.1.3 Target namespace: urn:schemas-microsoft-com:clickonce.v2

2.1.3.1 Global Elements

2.1.3.1.1 compatibleFrameworks

Target namespace: *urn:schemas-microsoft-com:clickonce.v2*

A [compatibleFrameworksType](#) element [<1>](#) specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="compatibleFrameworks" type="clickonce.v2:compatibleFrameworksType"/>
```

2.1.3.2 Global Attributes

None.

2.1.3.3 Complex Types

2.1.3.3.1 compatibleFrameworksType

Target namespace: *urn:schemas-microsoft-com:clickonce.v2*

Referenced by: compatibleFrameworks section [2.1.3.1.1](#)

The **compatibleFrameworksType** complex type contains one or more framework elements that specify the versions on which this application can run.

Element:

framework: A [frameworkType](#) element that specifies the framework versions on which this application can run.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="compatibleFrameworksType">
  <xs:sequence>
    <xs:choice>
```

```

        <xs:element name="framework" type="clickonce.v2:frameworkType"
minOccurs="1" maxOccurs="unbounded"/>
    </xs:choice>
</xs:sequence>
</xs:complexType>

```

2.1.3.3.2 frameworkType

Target namespace: *urn:schemas-microsoft-com:clickonce.v2*

Referenced by: compatibleFrameworksType section [2.1.3.3.1](#)

The frameworkType complex type specifies the versions on which this application can run.

Attributes:

targetVersion: A [twoPartVersionType](#) attribute that specifies the version number of the target on which this application can run.

profile: A [profileType](#) attribute that specifies the profile of the target on which this application can run.

supportedRuntime: A [threePartVersionType](#) attribute that specifies the version number of the runtime associated with the target on which this application can run.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```

<xs:complexType name="frameworkType">
  <xs:attribute name="targetVersion" type="clickonce.v2:twoPartVersionType"
use="required"/>
  <xs:attribute name="profile" type="clickonce.v2:profileType" use="required"/>
  <xs:attribute name="supportedRuntime" type="clickonce.v2:threePartVersionType"
use="required"/>
</xs:complexType>

```

2.1.3.4 Simple Types

2.1.3.4.1 twoPartVersionType

Target namespace: *urn:schemas-microsoft-com:clickonce.v2*

Referenced by: frameworkType section [2.1.3.3.2](#)

The **twoPartVersionType** simple type specifies the version number of the target on which this application can run.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```

<xs:simpleType name="twoPartVersionType">
  <xs:restriction base="xs:string">
    <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-
9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-
4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])" />
  </xs:restriction>
</xs:simpleType>

```

2.1.3.4.2 profileType

Target namespace: *urn:schemas-microsoft-com:clickonce.v2*

Referenced by: frameworkType section [2.1.3.3.2](#)

The **profileType** simple type specifies the profile of the target on which this application can run.

| Value | Meaning |
|--------|---|
| Full | Full framework |
| Client | Client profile, which is a subset of the full framework |

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="profileType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Full"/>
    <xs:enumeration value="Client"/>
  </xs:restriction>
</xs:simpleType>
```

2.1.3.4.3 threePartVersionType

Target namespace: *urn:schemas-microsoft-com:clickonce.v2*

Referenced by: frameworkType section [2.1.3.3.2](#)

The **threePartVersionType** simple type specifies the version number of the runtime associated with the target on which this application can run.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="threePartVersionType">
  <xs:restriction base="xs:string">
    <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\. (0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\. (0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])" />
  </xs:restriction>
</xs:simpleType>
```

2.2 Application Manifest

The **application manifest** is an **XML** file that specifies the dependencies and **entry points** for customizations included in the **deployment package**. The file name **MUST** end with ".manifest". The file size of the application manifest **MUST** be less than 16 megabytes. The **root element** of the application manifest **MUST** be assembly (section [2.2.1.1.1](#)).

2.2.1 Target namespace: urn:schemas-microsoft-com:asm.v1

2.2.1.1 Global Elements

2.2.1.1.1 assembly

Target namespace: urn:schemas-microsoft-com:asm.v1

An [assemblyType](#) element that specifies an application manifest.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="assembly" type="assemblyType"/>
```

2.2.1.2 Global Attributes

None.

2.2.1.3 Complex Types

2.2.1.3.1 assemblyIdentityType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyType](#)

The **assemblyIdentityType** complex type specifies an identifier for an **application manifest**.

Attributes:

name : A [fileNameStringType](#) attribute that specifies the name. The length of the string value MUST be less than 252 characters.

version : A [fourPartVersionType](#) attribute that specifies the version.

type : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies a reserved value.

processorArchitecture : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the processor architecture.

publicKeyToken : A [publicKeyTokenType](#) attribute that specifies the last 8 bytes of the SHA-1 **hash** ([\[FIPS180-4\]](#) section 6.1) of the **public key** used to generate the strong name signature (section [2.3](#)) for the application manifest in accordance with section [2.5.2.1](#).

language : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the **locale**.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="assemblyIdentityType">
  <xs:attribute name="name" type="asm.v1:fileNameStringType" use="required"/>
  <xs:attribute name="version" type="asm.v1:fourPartVersionType" use="required"/>
  <xs:attribute name="type" type="xs:string" use="optional" fixed="win32"/>
  <xs:attribute name="processorArchitecture" type="xs:string" use="required" fixed="msil"/>
  <xs:attribute name="publicKeyToken" type="asm.v1:publicKeyTokenType" use="required"/>
  <xs:attribute name="language" type="xs:string" use="required" fixed="neutral"/>
</xs:complexType>
```

```
</xs:complexType>
```

2.2.1.3.2 assemblyType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assembly](#)

The **assemblyType** complex type specifies an **application manifest**.

Child Elements:

assemblyIdentity : An [assemblyIdentityType](#) element that specifies an identifier for the application manifest.

application : An [application](#) element that specifies ignored data.

entryPoint : An [entryPoint](#) element that specifies an **entry point**.

trustInfo : A [trustInfo](#) element that specifies a container for a [securityType](#) element.

dependency : A [dependency](#) element that specifies a dependency required for the **deployment package**.

file : A [file](#) element that specifies a file that is a part of the deployment package.

addIn : An [addIn](#) element that specifies run-time behavior of the deployment package.

publisherIdentity : A [publisherIdentity](#) element that specifies the publisher of the deployment package.

Signature : A [SignatureType](#) element that specifies the necessary information to validate a signed application manifest.

Attributes:

manifestVersion : A [twoPartVersionType](#) attribute that specifies the version of the application manifest.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="assemblyType">
  <xs:sequence>
    <xs:element name="assemblyIdentity" type="asm.v1:assemblyIdentityType"/>
    <xs:element ref="asm.v2:application"/>
    <xs:element ref="asm.v2:entryPoint"/>
    <xs:element ref="asm.v2:trustInfo"/>
    <xs:element ref="asm.v2:dependency" minOccurs="0" maxOccurs="24575"/>
    <xs:element ref="asm.v2:file" minOccurs="0" maxOccurs="24575"/>
    <xs:element ref="vsta.v3:addIn"/>
    <xs:element ref="asm.v2:publisherIdentity"/>
    <xs:element ref="ds:Signature"/>
  </xs:sequence>
  <xs:attribute name="manifestVersion" type="asm.v1:twoPartVersionType" use="required"
    fixed="1.0"/>
</xs:complexType>
```

2.2.1.4 Simple Types

2.2.1.4.1 twoPartVersionType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyType](#)

The **twoPartVersionType** simple type specifies a version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="twoPartVersionType">
  <xs:restriction base="xs:string">
    <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])"/>
  </xs:restriction>
</xs:simpleType>
```

2.2.1.4.2 publicKeyTokenType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyIdentityType](#)

The **publicKeyTokenType** simple type specifies the last 8 bytes of the SHA-1 **hash**, as specified by [\[FIPS180-4\]](#) section 6.1, of a **public key** in accordance with section [2.5.2.1](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="publicKeyTokenType">
  <xs:restriction base="xs:string">
    <xs:pattern value="([0-9]|[a-f]|[A-F]){16}"/>
  </xs:restriction>
</xs:simpleType>
```

2.2.1.4.3 fourPartVersionType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyIdentityType](#)

The **fourPartVersionType** type specifies a version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="fourPartVersionType">
  <xs:restriction base="xs:string">
    <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])"/>
  </xs:restriction>
</xs:simpleType>
```

2.2.1.4.4 fileNameStringType

Target namespace: urn:schemas-microsoft-com:asm.v1

Referenced by: [assemblyIdentityType](#)

The **fileNameStringType** simple type specifies a string for a file name.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="fileNameStringType">
  <xs:restriction base="xs:string">
    <xs:pattern value="([\u0020]|\u0021|\u0024|\u0025|\u0027-\u0029|\u002B-
\u002E)|[\u0030-\u0039)|[\u003B)|[\u003D)|[\u0040-\u005B)|[\u005D-\u007B)|[\u007D-
\uFFFD)|[\u10000-\u10FFFF])*"/>
  </xs:restriction>
</xs:simpleType>
```

2.2.2 Target namespace: urn:schemas-microsoft-com:asm.v2

2.2.2.1 Global Elements

2.2.2.1.1 application

Target namespace: urn:schemas-microsoft-com:asm.v2

An [applicationType](#) element that specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="application" type="asm.v2:applicationType"/>
```

2.2.2.1.2 entryPoint

Target namespace: urn:schemas-microsoft-com:asm.v2

An [entryPointType](#) element that specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="entryPoint" type="asm.v2:entryPointType"/>
```

2.2.2.1.3 trustInfo

Target namespace: urn:schemas-microsoft-com:asm.v2

A [trustInfoType](#) element that specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="trustInfo" type="asm.v2:trustInfoType"/>
```

2.2.2.1.4 dependency

Target namespace: urn:schemas-microsoft-com:asm.v2

A [dependencyType](#) element that specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="dependency" type="asm.v2:dependencyType"/>
```

2.2.2.1.5 file

Target namespace: urn:schemas-microsoft-com:asm.v2

A [fileType](#) element that specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="file" type="asm.v2:fileType"/>
```

2.2.2.1.6 assemblyIdentity

Target namespace: urn:schemas-microsoft-com:asm.v2

An **assemblyIdentityType** (section [2.2.2.3.8](#)) element that specifies a global element that is referenced by **entryPointType** (section [2.2.5.3.4](#)), **postActionEntryPointType** (section [2.2.5.3.5](#)).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="assemblyIdentity" type="asm.v2:assemblyIdentityType"/>
```

2.2.2.1.7 publisherIdentity

Target namespace: urn:schemas-microsoft-com:asm.v2

A [publisherIdentityType](#) element that specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="publisherIdentity" type="asm.v2:publisherIdentityType"/>
```

2.2.2.2 Global Attributes

None.

2.2.2.3 Complex Types

2.2.2.3.1 applicationType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [application](#)

The **applicationType** complex type specifies ignored data.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="applicationType"/>
```

2.2.2.3.2 dependencyType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependency](#)

The **dependencyType** complex type specifies a dependency required by the **deployment package**.

Child Elements:

dependentAssembly : A [dependentAssemblyType](#) element that specifies the assembly is required by the deployment package.

dependentOS : A [dependentOSType](#) element that specifies a minimum operating system requirement of a deployment package.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="dependencyType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="dependentAssembly" type="asm.v2:dependentAssemblyType"/>
      <xs:element name="dependentOS" type="asm.v2:dependentOSType"/>
    </xs:choice>
  </xs:sequence>
</xs:complexType>
```

2.2.2.3.3 dependentAssemblyType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependencyType](#)

The **dependentAssemblyType** complex type specifies an assembly that is required by the **deployment package**.

Child Elements:

assemblyIdentity : An [assemblyIdentityType](#) element that specifies the unique identifier of the assembly.

hash : A [hashType](#) element that specifies a **hash** of the assembly.

Attributes:

dependencyType : A [dependencyTypeType](#) attribute that specifies the type of the dependency of the deployment package on the assembly.

codebase : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies a path to the dependent assembly.

size : An integer ([W3C-XSD] section 3.3.13) attribute that specifies the file size in bytes of the dependent assembly.

allowDelayedBinding : A boolean ([W3C-XSD] section 3.2.2) attribute that specifies a reserved value.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="dependentAssemblyType">
  <xs:sequence>
    <xs:element name="assemblyIdentity" type="asm.v2:assemblyIdentityType"/>
    <xs:element name="hash" type="asm.v2:hashType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="dependencyType" type="asm.v2:dependencyTypeType" use="optional"
  default="preRequisite"/>
  <xs:attribute name="codebase" type="xs:anyURI"/>
  <xs:attribute name="size" type="xs:integer" use="optional"/>
  <xs:attribute name="allowDelayedBinding" type="xs:boolean" use="required" fixed="true"/>
</xs:complexType>
```

2.2.2.3.4 hashType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependentAssemblyType](#), [fileType](#)

The **hashType** complex type specifies a **hash** of a file as specified by [\[XMLDSig\]](#) section 4.3.3.

The Transforms container element ([XMLDSig] section 4.3.3.4) MUST contain one Transform element. The value of the Algorithm attribute of the Transform element ([XMLDSig] section 4.3.3.4) MUST be "urn:schemas-microsoft-com:HashTransforms.Identity" (section [2.5.1](#)).

The value of the Algorithm attribute of the DigestMethod ([XMLDSig] section 4.3.3.5) MUST be "http://www.w3.org/2000/09/xmlsig#sha1".

All other attributes are ignored.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="hashType">
  <xs:complexContent>
    <xs:extension base="ds:ReferenceType">
      <xs:sequence>
        <xs:any namespace="##other" processContents="lax" minOccurs="0"
        maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

2.2.2.3.5 dependentOSType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependencyType](#)

A dependentOSType element that specifies a minimum operating system requirement of a **deployment package**.

Child Elements:

osVersionInfo : An [osVersionInfoType](#) element that specifies the minimum operating system version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="dependentOSType">
  <xs:sequence>
    <xs:element name="osVersionInfo" type="asm.v2:osVersionInfoType"/>
  </xs:sequence>
</xs:complexType>
```

2.2.2.3.6 osVersionInfoType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependentOSType](#)

The **osVersionInfoType** complex type specifies an operating system version.

Child Elements:

os : An [osType](#) element that specifies the operation system version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="osVersionInfoType">
  <xs:sequence>
    <xs:element name="os" type="asm.v2:osType"/>
  </xs:sequence>
</xs:complexType>
```

2.2.2.3.7 osType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [osVersionInfoType](#)

The **osType** complex type specifies an operation system version.

Attributes:

majorVersion : A [TwoByteVersion](#) attribute that specifies the major version.

minorVersion : A [TwoByteVersion](#) attribute that specifies the minor version.

buildNumber : A [TwoByteVersion](#) attribute that specifies the build number.

servicePackMajor : A [OneByteVersion](#) attribute that specifies the service pack major version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="osType">
  <xs:attribute name="majorVersion" type="asm.v2:TwoByteVersion" use="required" fixed="4"/>
  <xs:attribute name="minorVersion" type="asm.v2:TwoByteVersion" use="required" fixed="10"/>
  <xs:attribute name="buildNumber" type="asm.v2:TwoByteVersion" use="required" fixed="0"/>
</xs:complexType>
```



```
<xs:attribute name="servicePackMajor" type="asm.v2:OneByteVersion" use="required"
fixed="0"/>
</xs:complexType>
```

2.2.2.3.8 assemblyIdentityType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependentAssemblyType](#), [assemblyIdentity](#)

The **assemblyIdentityType** complex type specifies an identifier of an assembly.

Attributes:

name : A [fileNameStringType](#) attribute that specifies the name. The length of the string value MUST be less than 252 characters.

version : A [fourPartVersionType](#) attribute that specifies the version.

type : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies a reserved value.

processorArchitecture : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the processor architecture.

publicKeyToken : A [publicKeyTokenType](#) attribute that specifies the last 8 bytes of the SHA-1 **hash** ([\[FIPS180-4\]](#) section 6.1) of the **public key** used to verify the assembly in accordance with section [2.5.2.1](#).

language : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the **locale**.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="assemblyIdentityType">
  <xs:attribute name="name" type="asm.v2:fileNameStringType" use="required"/>
  <xs:attribute name="version" type="asm.v2:fourPartVersionType" use="required"/>
  <xs:attribute name="type" type="xs:string" use="optional" fixed="win32"/>
  <xs:attribute name="processorArchitecture" type="xs:string" use="optional" fixed="msil"/>
  <xs:attribute name="publicKeyToken" type="asm.v2:publicKeyTokenType" use="optional"/>
  <xs:attribute name="language" type="xs:string" use="optional" fixed="neutral"/>
</xs:complexType>
```

2.2.2.3.9 publisherIdentityType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [publisherIdentity](#)

The **publisherIdentityType** complex type specifies a publisher of a **deployment package**.

Attributes:

name : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the distinguished name of the publisher as specified in [\[RFC1779\]](#) section 2.3.

issuerKeyHash : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the SHA-1 **hash** ([\[FIPS180-4\]](#) section 6.1) of the **public key** in the certificate of the **certification authority (CA)** that issued the publisher's certificate ([\[RFC3280\]](#)). The SHA-1 public key hash is computed over the value of the subjectPublicKey field in the subjectPublicKeyInfo field ([\[RFC3280\]](#) section 4.1). The tag and length MUST be excluded from the value before calculation.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="publisherIdentityType">
  <xs:attribute name="name" type="xs:string"/>
  <xs:attribute name="issuerKeyHash" type="xs:string"/>
</xs:complexType>
```

2.2.2.3.10 **entryPointType**

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [entryPoint](#)

The **entryPointType** complex type specifies an **entry point**.

Child Elements:

customHostSpecified : A [customHostSpecified](#) element specifies whether the entry points are defined in the [addin](#) element.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="entryPointType">
  <xs:sequence>
    <xs:element ref="co.v1:customHostSpecified"/>
  </xs:sequence>
</xs:complexType>
```

2.2.2.3.11 **trustInfoType**

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [trustInfo](#)

The **trustInfoType** complex type specifies a container for a [securityType](#) element.

Child Elements:

security : A securityType element that specifies the permissions requested by the **deployment package**.

asmv3 : An [asmv3](#) element that specifies ignored data.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="trustInfoType">
  <xs:sequence>
    <xs:element name="security" type="asm.v2:securityType"/>
    <xs:element ref="asm.v3:asmv3" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

2.2.2.3.12 **securityType**

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [trustInfoType](#)

The **securityType** complex type elements specifies the permissions requested by a **deployment package**.

Child Elements:

applicationRequestMinimum : An [applicationRequestMinimumType](#) element that specifies permissions requested by the deployment package.

requestedPrivileges : A [requestedPrivilegesType](#) element that specifies a reserved value.

asmv3 : An [asmv3](#) element that specifies ignored data.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="securityType">
  <xs:sequence>
    <xs:element name="applicationRequestMinimum"
type="asm.v2:applicationRequestMinimumType"/>
    <xs:element name="requestedPrivileges" type="asm.v3:requestedPrivilegesType"/>
    <xs:element ref="asm.v3:asmv3" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
```

2.2.2.3.13 applicationRequestMinimumType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [securityType](#)

The **applicationRequestMinimumType** complex type specifies permissions requested by a **deployment package**.

Child Elements:

PermissionSet : A [PermissionSetType](#) element that specifies a **code access security permission set**.

defaultAssemblyRequest : A [defaultAssemblyRequestType](#) element that specifies the default code access security permission set requested by the deployment package.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="applicationRequestMinimumType">
  <xs:sequence>
    <xs:element name="PermissionSet" type="asm.v2:PermissionSetType"/>
    <xs:element name="defaultAssemblyRequest" type="asm.v2:defaultAssemblyRequestType"/>
  </xs:sequence>
</xs:complexType>
```

2.2.2.3.14 PermissionSetType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [applicationRequestMinimumType](#)

The **PermissionSetType** complex type specifies a **code access security permission set**.

Attributes:

ID : An ID ([\[W3C-XSD\]](#) section 3.3.8) attribute that specifies the identifier. MUST be "Custom".

Unrestricted : A boolean ([\[W3C-XSD\]](#) section 3.2.2) attribute that specifies the code access security permission set has no restrictions.

SameSite : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies ignored data.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="PermissionSetType">
  <xs:attribute name="ID" type="xs:ID" use="required"/>
  <xs:attribute name="Unrestricted" type="xs:boolean" use="required" fixed="true"/>
  <xs:attribute name="SameSite" type="xs:string" use="required" fixed="site"/>
</xs:complexType>
```

2.2.2.3.15 defaultAssemblyRequestType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [applicationRequestMinimumType](#)

The **defaultAssemblyRequestType** complex type specifies a default **code access security permission set** requested by a **deployment package**.

Attributes:

permissionSetReference : An IDREF ([\[W3C-XSD\]](#) section 3.3.9) attribute that specifies a default set of permissions. MUST be "Custom".

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="defaultAssemblyRequestType">
  <xs:attribute name="permissionSetReference" type="xs:IDREF"/>
</xs:complexType>
```

2.2.2.3.16 fileType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [file](#)

The **fileType** complex type specifies a **package file**.

Child Elements:

hash : A [hashType](#) element that specifies the hash of the file.

Attributes:

name : A (string [\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the name.

size : An (unsignedLong [\[W3C-XSD\]](#) section 3.3.21) attribute that specifies the file size in bytes.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```

<xs:complexType name="fileType">
  <xs:choice minOccurs="0" maxOccurs="unbounded">
    <xs:element name="hash" type="asm.v2:hashType"/>
  </xs:choice>
  <xs:attribute name="name" type="xs:string" use="required"/>
  <xs:attribute name="size" type="xs:unsignedLong" use="required"/>
</xs:complexType>

```

2.2.2.4 Simple Types

2.2.2.4.1 TwoByteVersion

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [osType](#)

The **TwoByteVersion** simple type specifies a version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```

<xs:simpleType name="TwoByteVersion">
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="65535"/>
  </xs:restriction>
</xs:simpleType>

```

2.2.2.4.2 OneByteVersion

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [osType](#)

The **OneByteVersion** simple type specifies a version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```

<xs:simpleType name="OneByteVersion">
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="255"/>
  </xs:restriction>
</xs:simpleType>

```

2.2.2.4.3 dependencyTypeType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [dependentAssemblyType](#)

The **dependencyTypeType** simple type specifies the type of a dependency.

| Value | Meaning |
|--------------|--|
| preRequisite | Specifies that the assembly is not a part of the deployment package . |

| Value | Meaning |
|---------|--|
| install | Specifies that the assembly is a part of the deployment package. |

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="dependencyTypeType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="preRequisite"/>
    <xs:enumeration value="install"/>
  </xs:restriction>
</xs:simpleType>
```

2.2.2.4.4 fileNameStringType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [assemblyIdentityType](#)

The **fileNameStringType** simple type specifies a string for a file name.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="fileNameStringType">
  <xs:restriction base="xs:string">
    <xs:pattern value="([\u0020]|\u0021|\u0024|\u0025|\u0027-\u0029|\u002B-\u002E)|[\u0030-\u0039]|\u003B|\u003D|\u0040-\u005B)|[\u005D-\u007B)|[\u007D-\uFFFD]|[\u1000-\u10FFF])*"/>
  </xs:restriction>
</xs:simpleType>
```

2.2.2.4.5 fourPartVersionType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [assemblyIdentityType](#)

The **fourPartVersionType** simple type specifies a version.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="fourPartVersionType">
  <xs:restriction base="xs:string">
    <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])*"/>
  </xs:restriction>
</xs:simpleType>
```

2.2.2.4.6 publicKeyTokenType

Target namespace: urn:schemas-microsoft-com:asm.v2

Referenced by: [assemblyIdentityType](#)

The **publicKeyTokenType** simple type specifies the last 8 bytes of the SHA-1 **hash** as specified by [\[FIPS180-4\]](#) section 6.1 of a **public key** in accordance with section [2.5.2.1](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="publicKeyTokenType">
  <xs:restriction base="xs:string">
    <xs:pattern value="([0-9]|[a-f]|[A-F]){16}" />
  </xs:restriction>
</xs:simpleType>
```

2.2.3 Target namespace: urn:schemas-microsoft-com:asm.v3

2.2.3.1 Global Elements

2.2.3.1.1 asmv3

Target namespace: urn:schemas-microsoft-com:asm.v3

An [asmv3Type](#) element that specifies a global element that is referenced by [trustInfoType](#), [securityType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="asmv3" type="asm.v3:asmv3Type" />
```

2.2.3.2 Global Attributes

None.

2.2.3.3 Complex Types

2.2.3.3.1 requestedPrivilegesType

Target namespace: urn:schemas-microsoft-com:asm.v3

The **RequestedPrivilegesType** complex type specifies a reserved value.

Child Elements:

requestedExecutionLevel : A [requestedExecutionLevelType](#) element that specifies a reserved value.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="requestedPrivilegesType">
  <xs:sequence>
    <xs:element name="requestedExecutionLevel" type="asm.v3:requestedExecutionLevelType" />
  </xs:sequence>
</xs:complexType>
```

2.2.3.3.2 requestedExecutionLevelType

Target namespace: urn:schemas-microsoft-com:asm.v3

Referenced by: [requestedPrivilegesType](#)

The **requestedExecutionLevelType** complex type specifies a reserved value.

Attributes:

level : A string ([W3C-XSD] section 3.2.1) attribute that specifies a reserved value.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="requestedExecutionLevelType">
  <xs:attribute name="level" type="xs:string" use="required" fixed="asInvoker"/>
</xs:complexType>
```

2.2.3.3.3 asmv3Type

Target namespace: urn:schemas-microsoft-com:asm.v3

Referenced by: [asmv3](#)

The **asmv3Type** complex type specifies ignored data.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="asmv3Type">
  <xs:sequence>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##any" processContents="skip"/>
  </xs:sequence>
</xs:complexType>
```

2.2.3.4 Simple Types

None.

2.2.4 Target namespace: urn:schemas-microsoft-com:clickonce.v1

2.2.4.1 Global Elements

2.2.4.1.1 customHostSpecified

Target namespace: urn:schemas-microsoft-com:clickonce.v1

A [customHostSpecifiedType](#) element that specifies a global element that is referenced by [entryPointType](#).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment defines the contents of this element.

```
<xs:element name="customHostSpecified" type="co.v1:customHostSpecifiedType"/>
```


2.2.4.2 Global Attributes

None.

2.2.4.3 Complex Types

2.2.4.3.1 customHostSpecifiedType

Target namespace: urn:schemas-microsoft-com:clickonce.v1

Referenced by: [customHostSpecified](#)

The **customHostSpecifiedType** element specifies that **entry points** are defined in an [addInType](#) element.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="customHostSpecifiedType"/>
```

2.2.4.4 Simple Types

None.

2.2.5 Target namespace: urn:schemas-microsoft-com:vsta.v3

2.2.5.1 Global Elements

2.2.5.1.1 addIn

Target namespace: urn:schemas-microsoft-com:vsta.v3

An [addInType](#) element that specifies a global element that is referenced by [assemblyType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="addIn" type="vsta.v3:addInType"/>
```

2.2.5.2 Global Attributes

None.

2.2.5.3 Complex Types

2.2.5.3.1 addInType

Target namespace: urn:schemas-microsoft-com:vsta.v3

Referenced by: [addIn](#)

The **addInType** complex type specifies run-time behavior of the **deployment package**.

Child Elements:

entryPointsCollection : An [entryPointsCollectionType](#) element that specifies the container for [entryPointsType](#) elements.

update : An [updateType](#) element that specifies the update behavior for the deployment package.

postActions : A [postActionsType](#) element that contains the list of [postActionType](#) elements.

application : An [applicationType](#) element that contains a [customizationsType](#) element.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="addInType">
  <xs:sequence>
    <xs:element name="entryPointsCollection" type="vsta.v3:entryPointsCollectionType"
minOccurs="1" maxOccurs="1"/>
    <xs:element name="update" type="vsta.v3:updateType" maxOccurs="1" minOccurs="1"/>
    <xs:element name="postActions" type="vsta.v3:postActionsType" maxOccurs="1"
minOccurs="0"/>
    <xs:element name="application" type="vsta.v3:applicationType" maxOccurs="1"
minOccurs="0"/>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>
```

2.2.5.3.2 entryPointsCollectionType

Target namespace: urn:schemas-microsoft-com:vsta.v3

Referenced by: [addInType](#)

The **entryPointsCollectionType** complex type specifies a container for [entryPointsType](#) elements.

Child Elements:

entryPoints : An [entryPointsType](#) element that specifies a list of [entryPointType](#) elements.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="entryPointsCollectionType">
  <xs:sequence>
    <xs:element name="entryPoints" type="vsta.v3:entryPointsType" minOccurs="1"
maxOccurs="unbounded"/>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>
```

2.2.5.3.3 entryPointsType

Target namespace: urn:schemas-microsoft-com:vsta.v3

Referenced by: [entryPointsCollectionType](#)

An [entryPointsType](#) specifies a list of **entry points** for a customization.

Child Elements:

entryPoint : An [entryPointType](#) element that specifies an entry point for the customization.

Attributes:

id : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the identifier of the customization. MUST be present when the structure contains more than one [customizationType](#) element. MUST match the id attribute value of a customizationType element that implements the entry points.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="entryPointsType">
  <xs:sequence>
    <xs:element name="entryPoint" type="vsta.v3:entryPointType" maxOccurs="unbounded"/>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:string" use="optional"/>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>
```

2.2.5.3.4 entryPointType

Target namespace: urn:schemas-microsoft-com:vsta.v3

Referenced by: [entryPointsType](#)

The **entryPointType** complex type specifies an **entry point** for a customization.

Child Elements:

assemblyIdentity : An [assemblyIdentity](#) element that specifies the identity of the assembly that implements the entry point for the customization.

Attributes:

class : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the entry point. MUST be a **fully qualified class name**.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="entryPointType" mixed="true">
  <xs:sequence minOccurs="1" maxOccurs="1">
    <xs:element ref="asm.v2:assemblyIdentity"/>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:attribute name="class" type="xs:string" use="required"/>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>
```

2.2.5.3.5 postActionEntryPointType

Target namespace: urn:schemas-microsoft-com:vsta.v3

Referenced by: [postActionType](#)

The **postActionEntryPointType** complex type specifies an entry point for a **deployment package post-deployment action**.

Child Elements:

assemblyIdentity : A [assemblyIdentity](#) element that specifies the identity of the assembly that implements the post-deployment action **entry point** for the deployment package.

Attributes:

class : A string ([W3C-XSD](#) section 3.2.1 attribute that specifies an entry point class. MUST be a **fully qualified class name**.

The following W3C XML Schema ([XMLSCHEMA1/2](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="postActionEntryPointType" mixed="true">
  <xs:sequence minOccurs="1" maxOccurs="1">
    <xs:element ref="asm.v2:assemblyIdentity"/>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:attribute name="class" type="xs:string" use="required"/>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>
```

2.2.5.3.6 updateType

Target namespace: urn:schemas-microsoft-com:vsta.v3

Referenced by: [addInType](#)

The **updateType** complex type specifies an update behavior for a **deployment package**.

Attributes:

enabled : A boolean ([W3C-XSD](#) section 3.2.2) attribute that specifies automatic checks for updates.

The following W3C XML Schema ([XMLSCHEMA1/2](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="updateType">
  <xs:sequence>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:attribute name="enabled" type="xs:boolean" use="required" fixed="false"/>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>
```

2.2.5.3.7 postActionsType

Target namespace: urn:schemas-microsoft-com:vsta.v3

Referenced by: [addInType](#)

The **postActionsType** type specifies a list of **post-deployment actions** for the **deployment package**.

Child Elements:

postAction : A [postActionType](#) element that specifies a post-deployment action.

The following W3C XML Schema ([XMLSCHEMA1/2](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="postActionsType">
```

```

<xs:sequence>
  <xs:element name="postAction" type="vsta.v3:postActionType" maxOccurs="unbounded"
minOccurs="0"/>
  <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
</xs:sequence>
<xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>

```

2.2.5.3.8 postActionType

Target namespace: urn:schemas-microsoft-com:vsta.v3

Referenced by: [postActionsType](#)

The **postActionType** complex type specifies a **post-deployment action**.

Child Elements:

entryPoint : A **postActionEntryPointType** (section [2.2.5.3.5](#)) element that specifies the **entry point** for the post-deployment action.

postActionData : A [postActionDataType](#) element that specifies the input data for the post-deployment action.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```

<xs:complexType name="postActionType">
  <xs:sequence>
    <xs:element name="entryPoint" type="vsta.v3:postActionEntryPointType" maxOccurs="1"
minOccurs="1"/>
    <xs:element name="postActionData" type="vsta.v3:postActionDataType" maxOccurs="1"
minOccurs="0"/>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>

```

2.2.5.3.9 postActionDataType

Target namespace: urn:schemas-microsoft-com:vsta.v3

Referenced by: [postActionType](#)

The **postActionDataType** complex type specifies input data for the **post-deployment action**.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```

<xs:complexType name="postActionDataType">
  <xs:sequence>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>

```

2.2.5.3.10 applicationType

Target namespace: urn:schemas-microsoft-com:vsta.v3

Referenced by: [addInType](#)

The **applicationType** complex type specifies a container for a [customizationsType](#) element.

Child Elements:

customizations : A [customizations](#) element that specifies a list of customizations in the **deployment package**.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="applicationType">
  <xs:sequence>
    <xs:element ref="vsto.v4:customizations"/>
  </xs:sequence>
</xs:complexType>
```

2.2.5.4 Simple Types

None.

2.2.6 Target namespace: urn:schemas-microsoft-com:vsto.v4

2.2.6.1 Global Elements

2.2.6.1.1 customizations

Target namespace: urn:schemas-microsoft-com:vsto.v4

A [customizationsType](#) element that specifies a global element that is referenced by [applicationType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this element.

```
<xs:element name="customizations" type="vsto.v4:customizationsType"/>
```

2.2.6.2 Global Attributes

None.

2.2.6.3 Complex Types

2.2.6.3.1 customizationsType

Target namespace: urn:schemas-microsoft-com:vsto.v4

Referenced by: [customizations](#)

Contains a list of [customizationType](#) elements.

Child Elements:

customization : A customizationType element that specifies the customization.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="customizationsType">
  <xs:sequence>
    <xs:element name="customization" type="vsto.v4:customizationType" minOccurs="1"
maxOccurs="unbounded"/>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>
```

2.2.6.3.2 customizationType

Target namespace: urn:schemas-microsoft-com:vsto.v4

Referenced by: [customizationsType](#)

Specifies a customization.

Child Elements:

appAddIn : An [appAddInType](#) element that specifies the customization is an **add-in**.

Attributes:

id : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies the identifier of the customization. MUST be unique within the scope of the parent customizationsType element. MUST be present when the structure contains more than one customizationType element.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="customizationType">
  <xs:sequence>
    <xs:choice minOccurs="1" maxOccurs="1">
      <xs:element name="appAddIn" type="vsto.v4:appAddInType"/>
    </xs:choice>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:attribute name="id" type="xs:string" use="optional"/>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>
```

2.2.6.3.3 appAddInType

Target namespace: urn:schemas-microsoft-com:vsto.v4

Referenced by: [customizationType](#)

Specifies the installation values of an **add-in**.

Child Elements:

friendlyName : A string ([\[W3C-XSD\]](#) section 3.2.1) element that specifies the user-displayable name. The length of the string value MUST be less than 261 characters.

description : A string ([\[W3C-XSD\]](#) section 3.2.1) element that specifies the user-displayable description. The length of the string value MUST be less than 32,768 characters.

Attributes:

application : A string ([W3C-XSD] section 3.2.1) attribute that specifies the customized application.

loadBehavior : A [loadBehaviorType](#) attribute that specifies the initial startup setting of the add-in.

keyName : A [keyStringType](#) attribute that specifies the name for storing and retrieving the installation values post installation. The length of the string value MUST be less than 215 characters. The length of the string value MUST be greater than zero characters.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this complex type.

```
<xs:complexType name="appAddInType">
  <xs:sequence>
    <xs:element name="friendlyName" type="xs:string" maxOccurs="1" minOccurs="1"/>
    <xs:element name="description" type="xs:string" maxOccurs="1" minOccurs="0"/>
    <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"/>
  </xs:sequence>
  <xs:attribute name="application" type="xs:string" use="required" fixed="Outlook"/>
  <xs:attribute name="loadBehavior" type="vsto.v4:loadBehaviorType" use="optional"/>
  <xs:attribute name="keyName" type="vsto.v4:keyStringType" use="required"/>
  <xs:anyAttribute namespace="##other" processContents="skip"/>
</xs:complexType>
```

2.2.6.4 Simple Types

2.2.6.4.1 loadBehaviorType

Target namespace: urn:schemas-microsoft-com:vsto.v4

Referenced by: [appAddInType](#)

Specifies the initial startup setting of an **add-in**.

| Value | Meaning |
|-------|--|
| 2 | Specifies that the add-in is disabled. |
| 3 | Specifies that the add-in is configured to run on startup of the customized application. |

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="loadBehaviorType">
  <xs:restriction base="xs:int">
    <xs:enumeration value="2"/>
    <xs:enumeration value="3"/>
  </xs:restriction>
</xs:simpleType>
```

2.2.6.4.2 keyStringType

Target namespace: urn:schemas-microsoft-com:vsto.v4

Referenced by: [appAddInType](#)

The **keyStringType** simple type specifies a string for a key name.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment defines the contents of this simple type.

```
<xs:simpleType name="keyStringType">
  <xs:restriction base="xs:string">
    <xs:pattern value="(\u0020|\u0021|[\u0023-\u0029]|[\u002B-\u0039]|\u003B|\u003D|[\u0040-
\u005B]|[\u005D-\u007B]|[\u007D-\uD7FF]|[\uE000-\uFFFD]|[\u10000-\u10FFFF])*"/>
  </xs:restriction>
</xs:simpleType>
```

2.3 Strong Name Signature

A strong name signature is a method to uniquely identify a manifest by using public key cryptography. The manifest MUST have the following criteria:

- The manifest file MUST be signed as specified in this section.
- The **public key** used to verify the strong name signature MUST be the same as the key used to generate the publicKeyToken attribute on the assemblyIdentity element (section [2.1.1.3.1](#) and section [2.2.1.3.1](#)) in accordance with section [2.5.2.1](#).

This section describes the profile of the XML Digital Signatures standard [\[XMLDSig\]](#) used by manifest signatures (section [2.1.1.3.3](#) and section [2.2.1.3.2](#)).

2.3.1 Target namespace: <http://www.w3.org/2000/09/xmldsig#>

2.3.1.1 Global Elements

2.3.1.1.1 Signature

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

A [SignatureType](#) element that is specified as a global element in [\[XMLDSig\]](#). This Signature element is referenced by assemblyType (section [2.1.1.3.3](#) and section [2.2.1.3.2](#)).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="Signature" type="ds:SignatureType" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.2 SignatureValue

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#)

A [SignatureValueType](#) element that is specified as a global element in [\[XMLDSig\]](#). This SignatureValue element is referenced by SignatureType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="SignatureValue" type="ds:SignatureValueType"
xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.3 SignedInfo

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#)

A [SignedInfoType](#) element that is specified as a global element in [\[XMLDSig\]](#). This SignedInfoType element is referenced by SignatureType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="SignedInfo" type="ds:SignedInfoType"
  xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.4 CanonicalizationMethod

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignedInfoType](#)

A [CanonicalizationMethodType](#) element that is specified as a global element in [\[XMLDSig\]](#). This CanonicalizationMethod element is referenced by SignedInfoType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="CanonicalizationMethod" type="ds:CanonicalizationMethodType"
  xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.5 SignatureMethod

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignedInfoType](#)

A [SignatureMethodType](#) element that is specified as a global element in [\[XMLDSig\]](#). This SignatureMethod element is referenced by SignedInfoType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="SignatureMethod" type="ds:SignatureMethodType"
  xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.6 Reference

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignedInfoType](#)

A [ReferenceType](#) element that is specified as a global element in [\[XMLDSig\]](#). This Reference element is referenced by SignedInfoType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="Reference" type="ds:ReferenceType" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.7 Transforms

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [ReferenceType](#)

A [TransformsType](#) element that is specified as a global element in [\[XMLDSig\]](#). This Transforms element is referenced by ReferenceType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="Transforms" type="ds:TransformsType"
xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.8 Transform

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [TransformsType](#)

A [TransformType](#) element that is specified as a global element in [\[XMLDSig\]](#). This Transform element is referenced by TransformsType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="Transform" type="ds:TransformType" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.9 DigestMethod

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [ReferenceType](#)

A [DigestMethodType](#) element that is specified as a global element in [\[XMLDSig\]](#). This DigestMethod element is referenced by ReferenceType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="DigestMethod" type="ds:DigestMethodType"
xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.10 DigestValue

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [ReferenceType](#)

A [DigestValueType](#) element that is specified as a global element in [\[XMLDSig\]](#). This DigestValue element is referenced by ReferenceType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="DigestValue" type="ds:DigestValueType"
  xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.11 KeyInfo

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#)

A [KeyInfoType](#) element that is specified as a global element in [\[XMLDSig\]](#). This KeyInfo element is referenced by SignatureType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="KeyInfo" type="ds:KeyInfoType" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.12 KeyValue

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [KeyInfoType](#)

A [KeyValue](#) element that is specified as a global element in [\[XMLDSig\]](#). This KeyValue element is referenced by KeyInfoType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="KeyValue" type="ds:KeyValue" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.1.13 RSAKeyValue

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [KeyInfoType](#)

A [RSAKeyValue](#) element that is specified as a global element in [\[XMLDSig\]](#). This RSAKeyValue element is referenced by KeyInfoType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="RSAKeyValue" type="ds:RSAKeyValue"
  xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.3.1.2 Global Attributes

None.

2.3.1.3 Complex Types

2.3.1.3.1 SignatureType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [Signature](#)

SignatureType specifies the information that is necessary to verify the integrity of a **digital signature**.

Child Elements:

ds:SignedInfo : A [SignedInfoType](#) element that specifies the information necessary to compute the **hash** of the manifest.

ds:SignatureValue : A [SignatureValueType](#) element that specifies the encoded value of the signature.

ds:KeyInfo : A [KeyInfoType](#) element that specifies the **public key** to be used to verify the signature.

Attributes:

Id : An ID ([\[W3C-XSD\]](#) section 3.3.8) attribute. The value of the Id attribute MUST be "StrongNameSignature".

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="SignatureType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:SignedInfo"/>
    <element ref="ds:SignatureValue"/>
    <element ref="ds:KeyInfo"/>
  </sequence>
  <attribute name="Id" type="ID" use="optional"/>
</complexType>
```

2.3.1.3.2 SignatureValueType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#), [SignatureValue](#)

The **SignatureValueType** complex type specifies the encoded value of the signature. The content of the SignatureValueType is defined in section 4.2 of [\[XMLDSig\]](#). All attributes of SignatureValueType are optional and are ignored.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="SignatureValueType" xmlns="http://www.w3.org/2001/XMLSchema">
  <simpleContent>
    <extension base="base64Binary"/>
  </simpleContent>
</complexType>
```

2.3.1.3.3 SignedInfoType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#), [SignedInfo](#)

The **SignedInfoType** complex type specifies the information necessary to compute the **hash** of the manifest. The content of the SignedInfoType is defined in section 4.3 of [\[XMLDSig\]](#).

Child Elements:

ds:CanonicalizationMethod : A [CanonicalizationMethodType](#) element that specifies the canonicalization algorithm to be applied when the **digital signature** is verified.

ds:SignatureMethod : A [SignatureMethodType](#) element that specifies the digital signature algorithm to be used when the digital signature is verified.

ds:Reference : A [ReferenceType](#) element that specifies the XML node-set to be verified.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="SignedInfoType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:CanonicalizationMethod"/>
    <element ref="ds:SignatureMethod"/>
    <element ref="ds:Reference"/>
  </sequence>
</complexType>
```

2.3.1.3.4 CanonicalizationMethodType

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [SignedInfoType](#), [CanonicalizationMethod](#)

The **CanonicalizationMethodType** complex type specifies the canonicalization algorithm that is applied to the SignedInfo element prior to computing the **hash**. The content of the CanonicalizationMethodType is defined in section 4.3.1 of [\[XMLDSig\]](#).

All child elements of CanonicalizationMethodType are optional and ignored.

Attributes:

Algorithm : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies the canonicalization algorithm. The canonicalization algorithm MUST be Exclusive XML CanonicalizationVersion 1.0 ([\[Excl-C14N\]](#)). The value of the Algorithm attribute MUST be "http://www.w3.org/2001/10/xml-exc-c14n#".

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="CanonicalizationMethodType" xmlns="http://www.w3.org/2001/XMLSchema">
  <attribute name="Algorithm" type="anyURI" use="required"/>
</complexType>
```

2.3.1.3.5 SignatureMethodType

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [SignedInfoType](#), [SignatureMethod](#)

The **SignatureMethodType** complex type specifies the information necessary to compute the **hash** of the manifest. The content of the SignatureMethodType is defined in section 4.3.2 of [\[XMLDSig\]](#).

All child elements of SignatureMethodType are optional and are ignored.

Attributes:

Algorithm : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies the **digital signature** algorithm. The digital signature algorithm MUST be RSA with SHA-1 ([\[XMLDSig\]](#) section 6.4.2). The value of the Algorithm attribute MUST be "http://www.w3.org/2000/09/xmldsig#rsa-sha1".

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="SignatureMethodType" xmlns="http://www.w3.org/2001/XMLSchema">
  <attribute name="Algorithm" type="anyURI" use="required"/>
</complexType>
```

2.3.1.3.6 ReferenceType

Target namespace: http://www.w3.org/2000/09/xmldsig#

Referenced by: [SignedInfoType](#), [Reference](#)

The **ReferenceType** complex type specifies the information necessary to compute the **digest** of the manifest. The content of the ReferenceType is defined in section 4.3.3 of [\[XMLDSig\]](#).

Child Elements:

ds:Transforms : A [TransformsType](#) element that specifies the transforms to be applied to the manifest when verifying the **digital signature**.

ds:DigestMethod : A [DigestMethodType](#) element that specifies the hashing algorithm to be applied to the manifest when the digital signature is verified.

ds:DigestValue : A [DigestValueType](#) element that specifies the encoded value of the digest.

Attributes:

URI : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies the node-set that contains the signature. The value of the URI attribute MUST be an empty string.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="ReferenceType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:Transforms"/>
    <element ref="ds:DigestMethod"/>
    <element ref="ds:DigestValue"/>
  </sequence>
  <attribute name="URI" type="anyURI" use="required"/>
</complexType>
```

2.3.1.3.7 TransformsType

Target namespace: http://www.w3.org/2000/09/xmldsig#

Referenced by: [ReferenceType](#), [Transforms](#)

The **TransformsType** complex type specifies the information to describe how the signer obtained the data object that was digested. The content of the TransformsType is defined in section 4.3.3.4 of [\[XMLDSig\]](#).

Child Elements:

ds:Transform : A [TransformType](#) element. When it specifies the Enveloped Signature Transform ([XMLDSig] section 6.6.4), the value of the Algorithm attribute MUST be "http://www.w3.org/2000/09/xmldsig#enveloped-signature". When it specifies the Exclusive XML CanonicalizationVersion 1.0 ([\[Excl-C14N\]](#)), the value of the Algorithm attribute MUST be "http://www.w3.org/2001/10/xml-exc-c14n#".

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="TransformsType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:Transform" maxOccurs="unbounded"/>
  </sequence>
</complexType>
```

2.3.1.3.8 TransformType

Target namespace: http://www.w3.org/2000/09/xmldsig#

Referenced by: [TransformsType](#), [Transform](#)

The **TransformType** complex type specifies the information to describe how the signer obtained the data object that was digested. The content of the TransformType is defined in section 4.3.3.4 of [\[XMLDSig\]](#).

Attributes:

Algorithm : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies a transform algorithm.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="TransformType" mixed="true" xmlns="http://www.w3.org/2001/XMLSchema">
  <attribute name="Algorithm" type="anyURI" use="required"/>
</complexType>
```

2.3.1.3.9 DigestMethodType

Target namespace: http://www.w3.org/2000/09/xmldsig#

Referenced by: [ReferenceType](#), [DigestMethod](#)

The **DigestMethodType** complex type specifies the digest algorithm to be applied to the manifest when the **digital signature** is verified. The content of the DigestMethodType is defined in section 4.3.3.5 of [\[XMLDSig\]](#).

Attributes:

Algorithm : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies the digest algorithm. The digest algorithm MUST be SHA-1 [\[FIPS180-4\]](#). The value of the Algorithm attribute MUST be "http://www.w3.org/2000/09/xmldsig#sha1" ([XMLDSig] section 6.2.1).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="DigestMethodType" mixed="true" xmlns="http://www.w3.org/2001/XMLSchema">
  <attribute name="Algorithm" type="anyURI" use="required"/>
</complexType>
```



```
</complexType>
```

2.3.1.3.10 KeyInfoType

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [SignatureType](#), [KeyInfo](#)

The **KeyInfoType** complex type specifies the information about the **public key** to be used to verify the signature. The content of the KeyInfoType is defined in section 4.4 of [\[XMLDSig\]](#).

Child Elements:

ds:KeyValue : A [KeyValue](#) element that contains the public key to be used to verify the signature.

msrel:RelData : A [RelDataType](#) element that specifies information about the software publisher. This element MUST be present.

Attributes:

Id : An ID ([\[W3C-XSD\]](#) section 3.2.1) attribute that identifies a KeyInfo element to contain information about a **strong name** public key. The value of Id attribute MUST be "StrongNameKeyInfo".

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="KeyInfoType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:KeyValue"/>
    <element ref="msrel:RelData"/>
  </sequence>
  <attribute name="Id" type="ID" use="optional"/>
</complexType>
```

2.3.1.3.11 KeyValue

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [KeyInfoType](#), [KeyInfo](#)

The **KeyValue** complex type specifies the **public key** component of the key used to generate the **strong name**.

Child Elements:

ds:RSAKeyValue : A [RSAKeyValue](#) element that specifies the modulus and exponent of an RSA public key ([\[RFC3447\]](#) section 3.1).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="KeyValue" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:RSAKeyValue"/>
  </sequence>
</complexType>
```

2.3.1.3.12 RSAKeyValue

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [KeyValue](#), [RSAKeyValue](#)

The **RSAKeyValue** complex type specifies the modulus and exponent of an RSA public key ([RFC3447] section 3.1). The content of the RSAKeyValue is defined in section 4.4.2.2 of [XMLDSig].

Child Elements:

Modulus : A [CryptoBinary](#) element that specifies the modulus of an RSA public key ([RFC3447] section 3.1).

Exponent : A [CryptoBinary](#) element that specifies the exponent of an RSA public key ([RFC3447] section 3.1).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="RSAKeyValue" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element name="Modulus" type="ds:CryptoBinary"/>
    <element name="Exponent" type="ds:CryptoBinary"/>
  </sequence>
</complexType>
```

2.3.1.4 Simple Types

2.3.1.4.1 CryptoBinary

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [RSAKeyValue](#)

The **CryptoBinary** simple type as specified in section 4.0.1 of [XMLDSig].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<simpleType name="CryptoBinary" xmlns="http://www.w3.org/2001/XMLSchema">
  <restriction base="base64Binary"/>
</simpleType>
```

2.3.1.4.2 DigestValueType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [ReferenceType](#), [DigestValue](#)

The **DigestValueType** simple type specifies the encoded value of the **digest**. The content of the DigestMethodType is defined in section 4.3.3.6 of [XMLDSig].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<simpleType name="DigestValueType" xmlns="http://www.w3.org/2001/XMLSchema">
```

```
<restriction base="base64Binary"/>
</simpleType>
```

2.3.2 Target namespace: <http://schemas.microsoft.com/windows/rel/2005/reldata>

2.3.2.1 Global Elements

2.3.2.1.1 RelData

Target namespace: <http://schemas.microsoft.com/windows/rel/2005/reldata>

A [RelDataType](#) element that specifies a global element that is referenced by [KeyInfoType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<xs:element name="RelData" type="RelDataType"/>
```

2.3.2.2 Global Attributes

None.

2.3.2.3 Complex Types

2.3.2.3.1 RelDataType

Target namespace: <http://schemas.microsoft.com/windows/rel/2005/reldata>

Referenced by: [RelData](#)

The **RelDataType** complex type specifies a container for a Rights Expression Language [\[ISO/IEC-21000-5\]](#) license that describes a software publisher.

Child Elements:

r:license : A [License](#) element that specifies publisher expressed using the Rights Expression Language [\[ISO/IEC-21000-5\]](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<xs:complexType name="RelDataType">
  <xs:sequence>
    <xs:element ref="r:license"/>
  </xs:sequence>
</xs:complexType>
```

2.3.2.4 Simple Types

None.

2.4 Software Publisher Signature

2.4.1 Target namespace: urn:mpeg:mpeg21:2003:01-REL-R-NS

2.4.1.1 Global Elements

2.4.1.1.1 license

Target namespace: urn:mpeg:mpeg21:2003:01-REL-R-NS

A [License](#) element that specifies a global element that is referenced by [RelDataType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="license" type="r:License"/>
```

2.4.1.2 Global Attributes

None.

2.4.1.3 Complex Types

2.4.1.3.1 License

Target namespace: urn:mpeg:mpeg21:2003:01-REL-R-NS

Referenced by: [license](#)

The **License** complex type specifies a description of a software publisher expressed using the Rights Expression Language [\[ISO/IEC-21000-5\]](#).

All attributes of License are optional and are ignored.

Child Elements:

grant : A [Grant](#) element that specifies a manifest to have the right to be signed by a particular software publisher.

issuer : An [Issuer](#) element that specifies the XML digital signature ([\[XMLDSig\]](#)) of the software publisher.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="License">
  <xsd:sequence>
    <xsd:element name="grant" type="r:Grant"/>
    <xsd:element name="issuer" type="r:Issuer"/>
  </xsd:sequence>
</xsd:complexType>
```

2.4.1.3.2 Grant

Target namespace: urn:mpeg:mpeg21:2003:01-REL-R-NS

Referenced by: [License](#)

The **Grant** complex type specifies a container for description of a software publisher expressed using the Rights Expression Language [\[ISO/IEC-21000-5\]](#).

Child Elements:

as:ManifestInformation : A [ManifestInformationType](#) element that specifies a **deployment manifest** or an **application manifest**.

as:SignedBy : A [SignedByType](#) element that specifies the right for a manifest to be signed by a software publisher.

as:AuthenticodePublisher : An [AuthenticodePublisherType](#) element that specifies a software publisher.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="Grant">
  <xsd:sequence>
    <xsd:element ref="as:ManifestInformation"/>
    <xsd:element ref="as:SignedBy"/>
    <xsd:element ref="as:AuthenticodePublisher"/>
  </xsd:sequence>
</xsd:complexType>
```

2.4.1.3.3 Issuer

Target namespace: urn:mpeg:mpeg21:2003:01-REL-R-NS

Referenced by: [License](#)

The **Issuer** complex type specifies a container for an XML digital signature [\[XMLDSig\]](#).

All attributes of Issuer are optional and are ignored.

Child Elements:

dsig:Signature : A [SignatureType](#) element that specifies the necessary information to validate a signed **deployment manifest** or **application manifest**.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="Issuer">
  <xsd:sequence>
    <xsd:element ref="dsig:Signature"/>
  </xsd:sequence>
</xsd:complexType>
```

2.4.1.3.4 Right

Target namespace: urn:mpeg:mpeg21:2003:01-REL-R-NS

The **Right** complex type as specified in section 7.4.3 of [\[ISO/IEC-21000-5\]](#). Right is a conceptually abstract type and is used by this specification only as a base type for [SignedByType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<xsd:complexType name="Right"/>
```

2.4.1.4 Simple Types

None.

2.4.2 Target namespace:

<http://schemas.microsoft.com/windows/pki/2005/Authenticode>

2.4.2.1 Global Elements

2.4.2.1.1 ManifestInformation

Target namespace: <http://schemas.microsoft.com/windows/pki/2005/Authenticode>

A [ManifestInformationType](#) element that specifies a global element that is referenced by [Grant](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<xs:element name="ManifestInformation" type="ManifestInformationType"/>
```

2.4.2.1.2 SignedBy

Target namespace: <http://schemas.microsoft.com/windows/pki/2005/Authenticode>

A [SignedByType](#) element that specifies a global element that is referenced by [Grant](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<xs:element name="SignedBy" type="SignedByType"/>
```

2.4.2.1.3 AuthenticodePublisher

Target namespace: <http://schemas.microsoft.com/windows/pki/2005/Authenticode>

An [AuthenticodePublisherType](#) element specifies a global element that is referenced by [Grant](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<xs:element name="AuthenticodePublisher" type="AuthenticodePublisherType"/>
```

2.4.2.1.4 Timestamp

Target namespace: <http://schemas.microsoft.com/windows/pki/2005/Authenticode>

A [CryptoBinary](#) element that specifies a global element that is referenced by [ObjectType](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<xs:element name="Timestamp" type="ds:CryptoBinary"/>
```

2.4.2.2 Global Attributes

None.

2.4.2.3 Complex Types

2.4.2.3.1 ManifestInformationType

Target namespace: <http://schemas.microsoft.com/windows/pki/2005/Authenticode>

Referenced by: [ManifestInformation](#)

The **ManifestInformationType** complex type specifies a **deployment manifest** or **application manifest**.

Child Elements:

assemblyIdentity : An assemblyIdentityType (section [2.1.1.3.1](#) and section [2.2.1.3.1](#)) element that specifies either a **deployment package** or an application manifest.

Attributes:

Hash : A CryptoBinary ([\[XMLDSig\]](#) section 4.0.1) attribute that specifies the hash of the manifest that the software publisher signed.

Description : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that specifies a short description of the deployment package.

Url : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies a Url that a user can visit to obtain more information about the deployment package and or the software publisher.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<xs:complexType name="ManifestInformationType">
  <xs:sequence>
    <xs:element name="assemblyIdentity" type="asm.v1:assemblyIdentityType"/>
  </xs:sequence>
  <xs:attribute name="Hash" type="ds:CryptoBinary" use="required"/>
  <xs:attribute name="Description" type="xs:string" use="optional"/>
  <xs:attribute name="Url" type="xs:anyURI" use="optional"/>
</xs:complexType>
```

2.4.2.3.2 SignedByType

Target namespace: <http://schemas.microsoft.com/windows/pki/2005/Authenticode>

Referenced by: [SignedBy](#)

The **SignedByType** complex type specifies the right for a manifest to be signed by a software publisher.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<xs:complexType name="SignedByType">
```

```
<xs:complexContent>
  <xs:restriction base="r:Right"/>
</xs:complexContent>
</xs:complexType>
```

2.4.2.3.3 AuthenticodePublisherType

Target namespace: <http://schemas.microsoft.com/windows/pki/2005/Authenticode>

Referenced by: [AuthenticodePublisher](#)

The **AuthenticodePublisherType** complex type specifies information about a software publisher.

Child Elements:

X509SubjectName : A string ([\[W3C-XSD\]](#) section 3.2.1) element that specifies the identity of a software publisher. The string is generated by converting the Subject distinguished name of the software publisher certificate.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<xs:complexType name="AuthenticodePublisherType">
  <xs:sequence>
    <xs:element name="X509SubjectName" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
```

2.4.2.4 Simple Types

None.

2.4.3 Target namespace: <http://www.w3.org/2000/09/xmlsig#>

2.4.3.1 Global Elements

2.4.3.1.1 Signature

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

A [SignatureType](#) element that is specified as a global element in [\[XMLDSig\]](#). This Signature element is referenced by [Issuer](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="Signature" type="ds:SignatureType" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.2 SignatureValue

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [SignatureType](#)

A [SignatureValueType](#) that is specified as a global element in [\[XMLDSig\]](#). This SignatureValue element is referenced by SignatureType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="SignatureValue" type="ds:SignatureValueType"
  xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.3 SignedInfo

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#)

A [SignedInfoType](#) element that is specified as a global element in [\[XMLDSig\]](#). This SignedInfo element is referenced by SignatureType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="SignedInfo" type="ds:SignedInfoType"
  xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.4 CanonicalizationMethod

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignedInfoType](#)

A [CanonicalizationMethodType](#) element that is specified as a global element in [\[XMLDSig\]](#). This CanonicalizationMethod element is referenced by SignedInfoType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="CanonicalizationMethod" type="ds:CanonicalizationMethodType"
  xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.5 SignatureMethod

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignedInfoType](#)

A [SignatureMethodType](#) element that is specified as a global element in [\[XMLDSig\]](#). This SignatureMethod element is referenced by SignedInfoType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="SignatureMethod" type="ds:SignatureMethodType"
  xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.6 Reference

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignedInfoType](#)

A [ReferenceType](#) element that is specified as a global element in [\[XMLDSig\]](#). This Reference element is referenced by SignedInfoType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="Reference" type="ds:ReferenceType" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.7 Transforms

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [ReferenceType](#)

A [TransformsType](#) element that is specified as a global element in [\[XMLDSig\]](#). This Transforms element is referenced by ReferenceType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="Transforms" type="ds:TransformsType"
xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.8 Transform

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [TransformsType](#)

A [TransformType](#) element that is specified as a global element in [\[XMLDSig\]](#). This Transform element is referenced by TransformsType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="Transform" type="ds:TransformType" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.9 DigestMethod

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [ReferenceType](#)

A [DigestMethodType](#) element that is specified as a global element in [\[XMLDSig\]](#). This DigestMethod element is referenced by ReferenceType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="DigestMethod" type="ds:DigestMethodType"
xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.10 DigestValue

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [ReferenceType](#)

A [DigestValueType](#) element that is specified as a global element in [\[XMLDSig\]](#). This DigestValue element is referenced by ReferenceType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="DigestValue" type="ds:DigestValueType"
xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.11 Object

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#)

An [ObjectType](#) element that is specified as a global element in [\[XMLDSig\]](#). This Object element is referenced by SignatureType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="Object" type="ds:ObjectType" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.12 KeyInfo

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#)

A [KeyInfoType](#) element that is specified as a global element in [\[XMLDSig\]](#). This KeyInfo element is referenced by SignatureType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="KeyInfo" type="ds:KeyInfoType" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.13 KeyValue

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [KeyInfoType](#)

A [KeyValue](#) element that is specified as a global element in [\[XMLDSig\]](#). This KeyValue element is referenced by KeyInfoType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="KeyValue" type="ds:KeyValue" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.14 X509Data

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [KeyInfoType](#)

A [X509DataType](#) element that is specified as a global element in [\[XMLDSig\]](#). This X509Data element is referenced by KeyInfoType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="X509Data" type="ds:X509DataType" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.1.15 RSAKeyValue

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [KeyValueType](#)

A [RSAKeyValue](#) element that is specified as a global element in [\[XMLDSig\]](#). This RSAKeyValue element is referenced by KeyValueType.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this element.

```
<element name="RSAKeyValue" type="ds:RSAKeyValue" xmlns="http://www.w3.org/2001/XMLSchema"/>
```

2.4.3.2 Global Attributes

None.

2.4.3.3 Complex Types

2.4.3.3.1 SignatureType

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [Signature](#)

The **SignatureType** complex type specifies the information that is necessary to verify the integrity of the **digital signature**. The content of the SignatureType is defined in section 4.1 of [\[XMLDSig\]](#).

Child Elements:

ds:SignedInfo : A [SignedInfoType](#) element that specifies the information necessary to compute the **digest** of the manifest.

ds:SignatureValue : A [SignatureValueType](#) element that specifies the encoded value of the signature.

ds:KeyInfo : A [KeyInfoType](#) element that specifies the information about the **public key** to be used to verify the signature.

ds:Object : An [ObjectType](#) element that specifies the **timestamp** information.

Other child elements of SignatureType are optional and are ignored.

Attributes:

Id : An ID ([\[W3C-XSD\]](#) section 3.3.8) attribute. The value of the Id attribute MUST be "AuthenticodeSignature".

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="SignatureType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:SignedInfo"/>
    <element ref="ds:SignatureValue"/>
    <element ref="ds:KeyInfo"/>
    <element ref="ds:Object" minOccurs="0"/>
  </sequence>
  <attribute name="Id" type="ID" use="optional"/>
</complexType>
```

2.4.3.3.2 SignatureValueType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#), [SignatureValue](#)

The **SignatureValueType** complex type specifies the encoded value of the signature. The content of the SignatureValueType is defined in section 4.2 of [\[XMLDSig\]](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="SignatureValueType" xmlns="http://www.w3.org/2001/XMLSchema">
  <simpleContent>
    <extension base="base64Binary"/>
  </simpleContent>
</complexType>
```

2.4.3.3.3 SignedInfoType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#), [SignedInfo](#)

The **SignedInfoType** complex type specifies the information necessary to compute the **digest** of the manifest. The content of the SignedInfoType is defined in section 4.3 of [\[XMLDSig\]](#).

Child Elements:

ds:CanonicalizationMethod : A [CanonicalizationMethodType](#) element that specifies the canonicalization algorithm to be applied to SignedInfo element when the **digital signature** is verified.

ds:SignatureMethod : A [SignatureMethodType](#) element that specifies the digital signature algorithm to be used when the digital signature is verified.

ds:Reference : A [ReferenceType](#) element that specifies the XML node-set to be verified.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="SignedInfoType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:CanonicalizationMethod"/>
    <element ref="ds:SignatureMethod"/>
  </sequence>
</complexType>
```

```
<element ref="ds:Reference"/>
</sequence>
</complexType>
```

2.4.3.3.4 CanonicalizationMethodType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignedInfoType](#), [CanonicalizationMethod](#)

The **CanonicalizationMethodType** complex type specifies the canonicalization algorithm that is applied to the [SignedInfo](#) element prior to computing the **digest**.

Attributes:

Algorithm : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies the canonicalization algorithm. The canonicalization algorithm MUST be Exclusive XML CanonicalizationVersion 1.0 ([\[Excl-C14N\]](#)). The value of the Algorithm attribute MUST be "http://www.w3.org/2001/10/xml-exc-c14n#"

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="CanonicalizationMethodType" xmlns="http://www.w3.org/2001/XMLSchema">
  <attribute name="Algorithm" type="anyURI" use="required"/>
</complexType>
```

2.4.3.3.5 SignatureMethodType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignedInfoType](#), [SignatureMethod](#)

The **SignatureMethodType** complex type specifies the information necessary to compute the **digest** of the manifest. The content of the SignatureMethodType is defined in section 4.3.2 of [\[XMLDSig\]](#).

Attributes:

Algorithm : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies the **digital signature** algorithm. The digital signature algorithm MUST be RSA with SHA-1 ([\[XMLDSig\]](#) section 6.4.2). The value of the Algorithm attribute MUST be "http://www.w3.org/2000/09/xmldsig#rsa-sha1".

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="SignatureMethodType" xmlns="http://www.w3.org/2001/XMLSchema">
  <attribute name="Algorithm" type="anyURI" use="required"/>
</complexType>
```

2.4.3.3.6 ReferenceType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignedInfoType](#), [Reference](#)

The **ReferenceType** complex type specifies the information necessary to compute the **digest** of the manifest. The content of the ReferenceType is defined in section 4.3.3 of [\[XMLDSig\]](#).

Child Elements:

ds:Transforms : A [TransformsType](#) element that specifies the transforms to be applied to the manifest when verifying the **digital signature**.

ds:DigestMethod : A [DigestMethodType](#) element that specifies the digest algorithm to be applied to the manifest when the digital signature is verified.

ds:DigestValue : A [DigestValueType](#) element that specifies the encoded value of the digest.

Attributes:

URI : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies the node-set that contains the signature. The value of the URI attribute MUST be an empty string.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="ReferenceType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:Transforms"/>
    <element ref="ds:DigestMethod"/>
    <element ref="ds:DigestValue"/>
  </sequence>
  <attribute name="URI" type="anyURI" use="required"/>
</complexType>
```

2.4.3.3.7 TransformsType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [ReferenceType](#), [Transforms](#)

The **TransformsType** complex type specifies the information to describe how the signer obtained the data that was digested. The content of the TransformsType is defined in section 4.3.3.4 of [\[XMLDSig\]](#).

Child Elements:

ds:Transform : A [TransformType](#) element. When it specifies the Enveloped Signature Transform ([\[XMLDSig\]](#) section 6.6.4), the value of the Algorithm attribute MUST be "http://www.w3.org/2000/09/xmldsig#enveloped-signature". When it specifies the Exclusive XML CanonicalizationVersion 1.0 ([\[Excl-C14N\]](#)), the value of the Algorithm attribute MUST be "http://www.w3.org/2001/10/xml-exc-c14n#".

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="TransformsType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:Transform" maxOccurs="unbounded"/>
  </sequence>
</complexType>
```

2.4.3.3.8 TransformType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [TransformsType](#), [Transform](#)

The **TransformType** complex type specifies the information to describe how the signer obtained the data object that was digested. The content of the TransformType is defined in section 4.3.3.4 of [\[XMLDSig\]](#).

Attributes:

Algorithm : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies a transform algorithm.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="TransformType" mixed="true" xmlns="http://www.w3.org/2001/XMLSchema">
  <attribute name="Algorithm" type="anyURI" use="required"/>
</complexType>
```

2.4.3.3.9 DigestMethodType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [ReferenceType](#), [DigestMethod](#)

The **DigestMethodType** complex type specifies the digest algorithm to be applied to the manifest when the **digital signature** is verified. The content of the DigestMethodType is defined in section 4.3.3.5 of [\[XMLDSig\]](#).

Attributes:

Algorithm : An anyURI ([\[W3C-XSD\]](#) section 3.2.17) attribute that specifies the digest algorithm. The digest algorithm MUST be SHA-1 ([\[FIPS180-4\]](#)). The value of the Algorithm attribute MUST be "http://www.w3.org/2000/09/xmldsig#sha1" ([\[XMLDSig\]](#) section 6.2.1).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="DigestMethodType" mixed="true" xmlns="http://www.w3.org/2001/XMLSchema">
  <attribute name="Algorithm" type="anyURI" use="required"/>
</complexType>
```

2.4.3.3.10 ObjectType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#), [Object](#)

The **ObjectType** complex type as specified in section 4.5 of [\[XMLDSig\]](#).

Child Elements:

as:Timestamp : A [CryptoBinary](#) element that specifies a base 64 encoded [\[RFC2045\]](#) **timestamp** that SHOULD be signed by a **time stamp authority**. The timestamp is formatted as a PKCS#7 SignedData ([\[RFC2315\]](#) section 9.1) according to the following restrictions:

- The version field MUST be 1.
- The digestAlgorithms field MUST contain at least one object identifier (OID) ([\[ITUX680\]](#)) for either MD5 (1.2.840.113549.2.5) [\[RFC1321\]](#) or SHA-1 (1.3.14.3.2.26) [\[RFC3279\]](#).
- The contentInfo field MUST consists of the following:
 - The contentType field MUST be the OID 1.2.840.113549.1.7.1.

- The content field MUST contain the signature value of the software publisher signature (for example, the content of the [SignatureValueType](#) that is not encoded using base64 [RFC2045]).
- The certificates field contains the certificate chain of the time stamp authority.
- The crls field is not used and MUST be null.
- The signerInfos field MUST contain one signerInfo ([RFC2315] section 9.2).
 - The digestEncryptionAlgorithm field MUST contain one of the following OIDs:
 - RSA-MD5 (1.2.840.113549.1.1.4)
 - RSA-SHA-1 (1.2.840.113549.1.1.5)
 - DSA-SHA-1 (1.2.840.10040.4.3)?
 - The unauthenticatedAttributes field MUST contain the following attributes:
 - ContentType ([PKCS9] section 6.3): The attribute's value MUST be set to PKCS #7 Data ([RFC2315] section 8).
 - SigningTime ([PKCS9] section 6.5): The value MUST be set as specified by [PKCS9] section 6.5.
 - messageDigest ([PKCS9] section 6.4): The value MUST be set as specified by [PKCS9] section 6.6.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="ObjectType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="as:Timestamp"/>
  </sequence>
</complexType>
```

2.4.3.3.11 KeyInfoType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [SignatureType](#), [KeyInfo](#)

The **KeyInfoType** complex type specifies the information about the **public key** to be used to verify the signature. The content of the KeyInfoType is defined in section 4.4 of [\[XMLDSig\]](#).

Child Elements:

ds:KeyValue : A [KeyValue](#) element that contains the public key to be used to verify the signature.

ds:X509Data : An [X509Data](#) element that specifies the digital certificate chain ([\[RFC3280\]](#)) of the software publisher.

Attributes:

Id : A string ([\[W3C-XSD\]](#) section 3.2.1) attribute that identifies a KeyInfo element. The Id attribute is optional and ignored.

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="KeyInfoType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:KeyValue"/>
    <element ref="ds:X509Data"/>
  </sequence>
  <attribute name="Id" type="ID" use="optional"/>
</complexType>
```

2.4.3.3.12 KeyValueType

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [KeyInfoType](#), [KeyValue](#)

The **KeyValueType** complex type specifies the information about the public key component of the key used to generate the **strong name**. The content of the KeyValueType is defined in section 4.4.2 of [\[XMLDSig\]](#).

Child Elements:

ds:RSAKeyValue : A [RSAKeyValue](#) element that specifies the modulus and exponent of an RSA public key ([\[RFC3447\]](#) section 3.1).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="KeyValueType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element ref="ds:RSAKeyValue"/>
  </sequence>
</complexType>
```

2.4.3.3.13 X509DataType

Target namespace: <http://www.w3.org/2000/09/xmlsig#>

Referenced by: [KeyInfoType](#), [X509Data](#)

The **X509DataType** complex type specifies one or more digital certificates of the software publisher and the issuing **certification authority (CA)**. Each digital certificate in the digital certificate chain is encoded in a separate X509Certificate child element. The content of the X509DataType is defined in section 4.4.4 of [\[XMLDSig\]](#).

Child Elements:

X509Certificate : A [base64Binary](#) ([\[W3C-XSD\]](#) section 3.2.16) element that specifies a base64 [\[RFC2045\]](#) encoded X.509 digital certificate [\[RFC3280\]](#).

The following W3C XML Schema ([\[XMLSCHEMA1/2\]](#) section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="X509DataType" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence maxOccurs="unbounded">
    <element name="X509Certificate" type="base64Binary"/>
  </sequence>
</complexType>
```

2.4.3.3.14 RSAKeyValue

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [KeyValue](#), [RSAKeyValue](#)

The **RSAKeyValue** complex type specifies the information about the modulus and exponent of an RSA public key ([RFC3447] section 3.1). The content of the RSAKeyValue is defined in section 4.4.2.2 of [XMLDSig].

Child Elements:

Modulus : A [CryptoBinary](#) element that specifies the modulus of an RSA public key ([RFC3447] section 3.1).

Exponent : A [CryptoBinary](#) element that specifies the exponent of an RSA public key ([RFC3447] section 3.1).

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this complex type.

```
<complexType name="RSAKeyValue" xmlns="http://www.w3.org/2001/XMLSchema">
  <sequence>
    <element name="Modulus" type="ds:CryptoBinary"/>
    <element name="Exponent" type="ds:CryptoBinary"/>
  </sequence>
</complexType>
```

2.4.3.4 Simple Types

2.4.3.4.1 CryptoBinary

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [RSAKeyValue](#), [ObjectType](#)

The **CryptoBinary** simple type as specified in [XMLDSig] section 4.0.1.

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<simpleType name="CryptoBinary" xmlns="http://www.w3.org/2001/XMLSchema">
  <restriction base="base64Binary"/>
</simpleType>
```

2.4.3.4.2 DigestValueType

Target namespace: <http://www.w3.org/2000/09/xmldsig#>

Referenced by: [ReferenceType](#), [DigestValue](#)

The **DigestValueType** simple type specifies the encoded value of the digest. The content of the DigestMethodType is defined in section 4.3.3.6 of [XMLDSig].

The following W3C XML Schema ([XMLSCHEMA1/2] section 2.1) fragment specifies the contents of this simple type.

```
<simpleType name="DigestValueType" xmlns="http://www.w3.org/2001/XMLSchema">
```

```
<restriction base="base64Binary"/>
</simpleType>
```

2.5 Algorithms

This section specifies algorithms used by section [2.1](#), section [2.2](#), section [2.3](#) and section [2.4](#).

2.5.1 HashTransforms.Identity

The HashTransforms.Identity algorithm is a transform algorithm as specified by [\[XMLDSig\]](#) section 6.6. The identifier for the algorithm is "urn:schemas-microsoft-com:HashTransforms.Identity". The algorithm has a single implicit parameter that is a byte stream. The output of this transform is a byte stream whose contents are exactly the same as the input byte stream.

2.5.2 Verification of Strong Name Signature

The strong name signature MUST be verified in accordance to the following criteria:

- The manifest signature MUST be verified according to section 3.2 of [\[XMLDSig\]](#) and the profile of [\[XMLDSig\]](#) specified in section [2.3.1](#), using the RSA public key ([\[RFC3447\]](#) section 3.1) included in the [RSAKeyValue](#) type.
- The value of the **publicKeyToken** attribute in the **assemblyIdentity** element (section [2.1.1.3.1](#) and section [2.2.1.3.1](#)) MUST be equal to the **public key** used in the previous step, after the public key has been converted from the [RSAKeyValue](#) type format into the **hexBinary** ([\[W3C-XSD\]](#) section 3.2.15) representation in accordance with section [2.5.2.1](#).
- The **publisherIdentity** element (section [2.1.2.3.6](#) and section [2.2.2.3.9](#)) MUST be present:
 - A software publisher signature (section [2.4](#)) MUST be present:
 - The [RelData](#) element MUST be present.
 - The [RelData](#) element MUST contain a [license](#) element.
 - The string representation (section [2.5.3.4](#)) of the **Subject** name ([\[RFC3280\]](#) section 4.1.2.6) in the software publisher certificate MUST be identical with the value of the **X509SubjectName** element (section [2.4.2.3.3](#)), as well as the value of the name attribute of the [publisherIdentity](#) element (section [2.1.2.3.6](#) and section [2.2.2.3.9](#)).
 - The SHA-1 hash ([\[FIPS180-4\]](#) section 6.1) of the public key of the **certification authority (CA)** that issued the software publisher certificate MUST be identical to the value of the **issuerKeyHash** attribute on the **publisherIdentity** element (section [2.1.2.3.6](#) and section [2.2.2.3.9](#)).

2.5.2.1 Conversion from RSA Public Key to publicKeyToken

Convert the RSA public key ([\[RFC3447\]](#) section 3.1) into the CryptoAPI **PUBLICKEYBLOB** format described in section [2.5.2.2](#).

1. Construct the **PublicKeyBlob** using the result from step 1 in accordance with section [2.5.2.3](#).
2. Compute the SHA-1 hash ([\[FIPS180-4\]](#) section 6.1) of the **PublicKeyBlob**.
3. Take the last 8 bytes from the result of step 3, then reverse the order of those bytes.

4. Encode the result of step 4 into the hexBinary ([W3C-XSD] section 3.2.15) representation.

2.5.2.2 CryptoAPI PUBLICKEYBLOB Format

| 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 |
|-----------------|---|---|---|---|---|---|---|------|---|----|----|----|----|----|----|------|----|----|----|----|----|----|----|------|----|----|----|----|----|----|----|
| 0x06 | | | | | | | | 0x02 | | | | | | | | 0x00 | | | | | | | | 0x00 | | | | | | | |
| 0x00 | | | | | | | | 0x24 | | | | | | | | 0x00 | | | | | | | | 0x00 | | | | | | | |
| 0x52 | | | | | | | | 0x53 | | | | | | | | 0x41 | | | | | | | | 0x31 | | | | | | | |
| 0x00 | | | | | | | | 0x08 | | | | | | | | 0x00 | | | | | | | | 0x00 | | | | | | | |
| Public Exponent | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Modulus | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ... | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (Variable) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Public Exponent (4 bytes): This MUST be a 32-bit unsigned number in little-endian format. It MUST be the public exponent of the key pair, referred to as **e** in [RFC3447] section 2.

Modulus (Variable): This MUST be the RSA modulus, referred to as **n** in [RFC3447] section 2. It MUST be encoded in little-endian format.

2.5.2.3 PublicKeyBlob Format

| 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 |
|------|---|---|---|---|---|---|---|------|---|----|----|----|----|----|----|------|----|----|----|----|----|----|----|------|----|----|----|----|----|----|----|
| 0x00 | | | | | | | | 0x24 | | | | | | | | 0x00 | | | | | | | | 0x00 | | | | | | | |
| 0x04 | | | | | | | | 0x80 | | | | | | | | 0x00 | | | | | | | | 0x00 | | | | | | | |

| |
|--------------------|
| Size of Public Key |
| ... |
| Public Key |
| ... |
| ... |
| ... |
| ... |
| (Variable) |

Size of Public Key (8 bytes): This MUST be a 64-bit unsigned integer in little-endian format. It MUST contain the size of the Public Key in bytes.

Public Key (Variable): This MUST be an RSA public key ([\[RFC3447\]](#) section 3.1) encoded as described in section [2.5.2.1](#). The size of the Public Key MUST be equal to the value defined by Size of Public Key.

2.5.3 Software Publisher Identity Verification

The software publisher identity MUST be verified according to the following criteria:

- The Rights Expression Language [\[ISO/IEC-21000-5\]](#) license MUST be verified according to section [2.5.3.1](#).
- If a **timestamp** is present, verify the timestamp according to the timestamp processing rules described in section [2.5.3.3](#).
- Verify the software publisher certificate according to the software publisher certificate processing rules described in section [2.5.3.2](#).
- The value of the hash attribute in the [ManifestInformationType](#) MUST be the same as the computed **hash** value for the manifest, excluding the signature element (section [2.1.1.3.3](#) and section [2.2.1.3.2](#)).

2.5.3.1 REL License Verification

The Rights Expression Language [\[ISO/IEC-21000-5\]](#) license MUST be verified according to the following criteria:

- The Rights Expression Language [ISO/IEC-21000-5] license MUST be conformant to the profile defined in section [2.3.2](#).
- The [license](#) element subtree MUST be verified as a separate XML document where the license element is the root node of the XML document.

- The manifest signature MUST be verified according to section 3.2 of [\[XMLDSig\]](#) and the profile of [\[XMLDSig\]](#) specified in section [2.4.3](#), using the RSA public key ([\[RFC3447\]](#) section 3.1) included in the [RSAKeyValue](#) type.
- The signature of the REL license MUST be verified using the **public key** in the software publisher certificate. The [RSAKeyValue](#) type MUST be present and it MUST contain the same public key as the key in the software publisher certificate.
- The string representation (section [2.5.3.4](#)) of the Subject name ([\[RFC3280\]](#) section 4.1.2.6) in the software publisher certificate MUST be identical with the value of the X509SubjectName element (section [2.4.2.3.3](#)).

2.5.3.2 Software Publisher Certificate Processing

The software publisher's signing certificate and certificate chain MUST be verified against the following criteria:

- The certificate chain MUST be validated to a trusted root certificate by using X.509 path validation rules as specified by [\[RFC3280\]](#) section 6.
- Either the signing certificate MUST contain the extended key usage (EKU) ([\[RFC3280\]](#) section 4.2.1.13) value for code signing ("1.3.6.1.5.5.7.3.3.") or there MUST be no EKU fields present in the signing certificate.
- The certificate chain MUST be within its validity period. If the certificate chain is not within its validity period, the signature MUST have a **timestamp** and that timestamp MUST be validated according to the timestamp processing rules (section [2.5.3.3](#)). If the signature has a timestamp, the certificate chain MUST be within its validity period at the timestamp time.

If any of these conditions are not met, the signature MUST be treated as invalid.

2.5.3.3 Timestamp Processing

A timestamp MUST be verified according to the following criteria:

- The signature of the timestamp MUST be verified according to ([\[RFC2315\]](#) section 9).
- The certificate chain obtained from the timestamp MUST be built to a trusted root certificate using X.509 path validation rules as specified by [\[RFC3280\]](#) section 6.
- The **time stamp authority** certificate MUST contain the EKU value for timestamping ("1.3.6.1.5.5.7.3.8") ([\[RFC3280\]](#) section 4.2.1.13).
- The base 64 encoded value of the content field of the timestamp element (section [2.4.3.3.10](#)) MUST be equal to the value of [SignatureValueType](#).

2.5.3.4 Converting an X.509 Distinguish Name to a String

The Subject name field of an X.509 certificate ([\[RFC3280\]](#) section 4.1.2.6) is converted to a string according to [\[RFC1779\]](#) but with the following deviations:

1. <spaced-separator> is defined as a comma, followed by a space character:

<spaced-separator> ::= ", " "

2. No optional space characters are added when converting attributes:

<attribute> ::= <string> | <key> "=" <string>

3. If the attribute type is listed in the following table, the corresponding keyword is used.

| Object Identifier | Keyword |
|----------------------------|--------------|
| 2.5.4.3 | CN |
| 2.5.4.7 | L |
| 2.5.4.10 | O |
| 2.5.4.11 | OU |
| 1.2.840.113549.1.9.1 | E |
| 2.5.4.6 | C |
| 2.5.4.8 | S |
| 2.5.4.9 | STREET |
| 2.5.4.12 | T |
| 2.5.4.42 | G |
| 2.5.4.43 | I |
| 2.5.4.4 | SN |
| 2.5.4.5 | SERIALNUMBER |
| 0.9.2342.19200300.100.1.25 | DC |
| 2.5.4.13 | Description |
| 2.5.4.17 | PostalCode |
| 2.5.4.18 | POBox |
| 2.5.4.20 | Phone |

4. If the attribute type is not listed, the attribute is represented by the prefix "OID.", followed by the dotted-decimal representation of the OBJECT IDENTIFIER. For example,

CN=John Doe, OID.1.3.6.1.4.1.311.1.1=Sample Text

5. Double quotation characters (") are added around a converted attribute value if:
 - a leading or trailing space character is present
 - one or more of the following characters are present:
 - Comma (,)
 - Plus sign (+)
 - Equal sign (=)
 - ASCII line feed character (decimal 10)
 - Less than sign (<)
 - Greater than sign (>)
 - Number sign (#)
 - Semicolon (;)
 - Single quotation (')
6. Single quotation characters (') are added around a converted attribute value if the double quotation character (") is present.
7. Strings that contain consecutive spaces are not enclosed within quotation marks.
8. Empty strings are enclosed within double quotation marks.

3 Structure Examples

In the following sections, the schema definition might differ from the processing rules imposed by the protocol. The XSD in this specification provides a base description of the file format. The text that introduces the XSD specifies additional restrictions that reflect protocol behavior. For example, the schema definition might allow for an element to be **empty**, **null**, or **not present** but the behavior of the protocol as specified restricts the same elements to being **non-empty**, **present**, and **not null**.

The following example describes the contents of a typical **deployment package** that contains a single **add-in** with one additional file. The package also defines a **post-deployment action**.

The deployment package consists of the following files:

- **deployment manifest**: SolutionAddIn.vsto
- **application manifest**: application.manifest
- **package files**: file.txt.deploy and SolutionAddIn.dll.deploy

The package files have not been included in this example.

The hashes and signature information in this sample have to be updated to match the customization assemblies, dependent files, and certificate being used.

3.1 Deployment Manifest

The **deployment manifest** specifies a **deployment package** with "Solution" product name. The deployment manifest also specifies "DefaultPublisher" as the publisher. The version of the deployment package is 1.0.0.0. The deployment manifest specifies an **application manifest** with "application.manifest" file name.

File name: SolutionAddIn.vsto

```
<?xml version="1.0" encoding="utf-8"?>
<asmv1:assembly xsi:schemaLocation="urn:schemas-microsoft-com:asm.v1 assembly.adaptive.xsd"
manifestVersion="1.0" xmlns:dsig="http://www.w3.org/2000/09/xmldsig#" xmlns="urn:schemas-
microsoft-com:asm.v2" xmlns:asmv1="urn:schemas-microsoft-com:asm.v1"
xmlns:asmv2="urn:schemas-microsoft-com:asm.v2" xmlns:xrml="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <assemblyIdentity name="SolutionAddIn.vsto" version="1.0.0.0"
publicKeyToken="b066060cc54477c1" language="neutral" processorArchitecture="msil"
xmlns="urn:schemas-microsoft-com:asm.v1" />
  <description asmv2:publisher="DefaultPublisher" asmv2:product="Solution"
xmlns="urn:schemas-microsoft-com:asm.v1" />
  <deployment install="false" mapFileExtensions="true" />
  <dependency>
    <dependentAssembly dependencyType="install" codebase="application.manifest" size="12267">
      <assemblyIdentity name="SolutionAddIn.dll" version="1.0.0.0"
publicKeyToken="b066060cc54477c1" language="neutral" processorArchitecture="msil"
type="win32" />
      <hash>
        <dsig:Transforms>
          <dsig:Transform Algorithm="urn:schemas-microsoft-com:HashTransforms.Identity" />
        </dsig:Transforms>
        <dsig:DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
        <dsig:DigestValue>ZPE5Laa0vNtrMu975iuZUyCQdvU=</dsig:DigestValue>
      </hash>
    </dependentAssembly>
  </dependency>
  <publisherIdentity name="CN=domain\user_name"
issuerKeyHash="9c928594208093ebb2e5ef59a0741d206f531315" />
  <Signature Id="StrongNameSignature" xmlns="http://www.w3.org/2000/09/xmldsig#">
    <SignedInfo>
```

```

    <CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
  <SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1" />
    <Reference URI="">
      <Transforms>
        <Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature" />
        <Transform Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
      </Transforms>
      <DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
      <DigestValue>HffV8wZDgFWlf2qTe5BLbjG2Fmo=</DigestValue>
    </Reference>
  </SignedInfo>

  <SignatureValue>dqbdvXmZ8X+P0lEfJopm78P4yUOCHvPbuzovIevdFEiFZy7cQyiA6v/1SofzUGY0Mv/DmqQF/EIU
  vnF9PuWesxiLkyCuaQuQHPRsdDcmAkq+aNW09OnYrymL27uSsc+KxlaGN+3U/zxPieOTyJoh+8/f3+tRcpjZFIOQlpo3F
  Q=</SignatureValue>
    <KeyInfo Id="StrongNameKeyInfo">
      <KeyValue>
        <RSAKeyValue>

          <Modulus>3WAAL94VOOQBWMFmGR5520LjqvUtfZZ5x8mXBylxIj5SNwWiLZCFcDEn3jWFC/QyII0jbsRh7t6/UjojcVkJ
          9q0IOMZH7LiREiCQytbQZhtlRt8cgP3Vbob9ChKuKbA8QrvisaFmjniOLyT3T46Wd3ywF3prqGXQmcXuRcaRIjc=</Mod
          ulus>
            <Exponent>AQAB</Exponent>
          </RSAKeyValue>
        </KeyValue>
        <msrel:RelData xmlns:msrel="http://schemas.microsoft.com/windows/rel/2005/reldata">
          <r:license xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
          xmlns:as="http://schemas.microsoft.com/windows/pki/2005/Authenticode">
            <r:grant>
              <as:ManifestInformation Hash="6a16b6316e4b907b936a7fa555804306f3d5f71d"
              Description="" Url="">
                <as:assemblyIdentity name="SolutionAddIn.vsto" version="1.0.0"
                publicKeyToken="b066060cc54477c1" language="neutral" processorArchitecture="msil"
                xmlns="urn:schemas-microsoft-com:asm.v1" />
              </as:ManifestInformation>
              <as:SignedBy />
              <as:AuthenticodePublisher>
                <as:X509SubjectName>CN=domain\user_name</as:X509SubjectName>
              </as:AuthenticodePublisher>
            </r:grant>
            <r:issuer>
              <Signature Id="AuthenticodeSignature" xmlns="http://www.w3.org/2000/09/xmldsig#">
                <SignedInfo>
                  <CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#"
                  />
                  <SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1" />
                  <Reference URI="">
                    <Transforms>
                      <Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-
                      signature" />
                      <Transform Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
                    </Transforms>
                    <DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
                    <DigestValue>K/VSW7AqnTijU4lOgquOt+t6rZI=</DigestValue>
                  </Reference>
                </SignedInfo>

                <SignatureValue>WV+k1Z2Tsa7mBDgZZWHykPVYRXIvyFC3D+ZFPv5bdtegUNGx7+Wy+82cn1UGfQdQvztt9OBRpESV5
                Bt7R46TdV63VlX57/vpBqT+4NsQbvVarPKmslGp9lg5kWeO43PPjNe9B6GRNAaTqk35znR+CZJVeIpiV0jfpn/Ka3vM3T
                w=</SignatureValue>
                  <KeyInfo>
                    <KeyValue>
                      <RSAKeyValue>

                        <Modulus>3WAAL94VOOQBWMFmGR5520LjqvUtfZZ5x8mXBylxIj5SNwWiLZCFcDEn3jWFC/QyII0jbsRh7t6/UjojcVkJ
                        9q0IOMZH7LiREiCQytbQZhtlRt8cgP3Vbob9ChKuKbA8QrvisaFmjniOLyT3T46Wd3ywF3prqGXQmcXuRcaRIjc=</Mod
                        ulus>
                          <Exponent>AQAB</Exponent>
                        </RSAKeyValue>
                      </KeyValue>
                    </KeyInfo>
                  </SignedInfo>
                </Signature>
              </r:issuer>
            </as:AuthenticodePublisher>
          </r:license>
        </msrel:RelData>
      </KeyInfo>
    </SignatureValue>
  </Signature>

```

```

        </KeyValue>
        <X509Data>

        <X509Certificate>MIIB6jCCAvegAwIBAgIQ/K/TJGThnqRP5PtyhbWt1jAJBgUrDgMCHQUAMCsxKTANBgNVBAMEIABS
        AEUARABNAE8ATgBEAFwAYgBpAGEAcABwAGwAYQBIMB4XDTA5MDUyNjE3MTkyOFoXDTM5MDEwMjAwMDAwMfowKzEPMCCGA
        1UEAx4gAFIARQBEAE0ATwBOAEQAXABiAGkAYQBWAAAAhABhAGIwgZ8wDQYJKoZIhvcNAQEBBQADgY0AMIGJAoGBAN1gAC
        /eFTjkAVjBZhkeedji46r1LX2WecfJlwtcSI+UjcmIi2QhXaxJ941hQv0MiCNI27EYe7ev1I6I3FZCfatCDjGR+y4kRI
        gkMrW0GYbZUbfHID91W6G/QoSrimwPEK74rGhZo54ji8k90+Olnd8sBd6a6h10JnF7kXGkSI3AgMBAAGjFzAVMBMGA1Ud
        JQOMMAoGCCsGAQUFBwMDMAkGBSsOAwIdBQADgYEAlAHOz8X1R8tq25KzulhX3VclbhtoeoPBPm0WT/eCTRqqUY6xUO+9T
        7e/thWC/cXKPgmBa34fT8BOzX61vPsk8xhLtEqJ8uvvN/K6pBU3rYjNtk9mblyPPWni0/ALzdQEFEYa5hjbNggIjDqLzK
        YuNvpCzJK/TFdX4HH+FDTBKrA=</X509Certificate>
        </X509Data>
        </KeyInfo>
        </Signature>
    </r:issuer>
    </r:license>
    </msrel:RelData>
    </KeyInfo>
    </Signature>
</asmv1:assembly>

```

3.2 Application Manifest

The **application manifest** specifies a single customization of the type **add-in** implemented by the "SolutionAddIn.dll" assembly. The "SolutionAddIn.dll" assembly is a **package file** included in the **deployment package**. The application manifest specifies another file with the name "file.txt" that is included in the deployment package. The application manifest also specifies a **post-deployment action** with the "SolutionDeploymentPostAction" **entry point**.

```

File name: application.manifest
<?xml version="1.0" encoding="utf-8"?>
<asmv1:assembly xsi:schemaLocation="urn:schemas-microsoft-com:asm.v1 assembly.adaptive.xsd"
manifestVersion="1.0" xmlns:dsig="http://www.w3.org/2000/09/xmldsig#" xmlns="urn:schemas-
microsoft-com:asm.v2" xmlns:asmv1="urn:schemas-microsoft-com:asm.v1"
xmlns:asmv2="urn:schemas-microsoft-com:asm.v2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance">
  <asmv1:assemblyIdentity name="SolutionAddIn.dll" version="1.0.0.0"
publicKeyToken="b066060cc54477c1" language="neutral" processorArchitecture="msil"
type="win32" />
  <application />
  <entryPoint>
    <co.v1:customHostSpecified xmlns:co.v1="urn:schemas-microsoft-com:clickonce.v1" />
  </entryPoint>
  <trustInfo>
    <security xmlns="urn:schemas-microsoft-com:asm.v2">
      <applicationRequestMinimum>
        <PermissionSet Unrestricted="true" ID="Custom" SameSite="site" />
        <defaultAssemblyRequest permissionSetReference="Custom" />
      </applicationRequestMinimum>
      <requestedExecutionLevel level="asInvoker" xmlns="urn:schemas-microsoft-com:asm.v3" />
    </security>
  </trustInfo>
  <dependency>
    <dependentOS>
      <osVersionInfo>
        <os majorVersion="4" minorVersion="10" buildNumber="0" servicePackMajor="0" />
      </osVersionInfo>
    </dependentOS>
  </dependency>
  <dependency>
    <dependentAssembly dependencyType="preRequisite" allowDelayedBinding="true">
      <assemblyIdentity name="Microsoft.Windows.CommonLanguageRuntime" version="2.0.50727.0"
/ >
    </dependentAssembly>
  </dependency>

```

```

<dependency>
  <dependentAssembly dependencyType="install" allowDelayedBinding="true"
  codebase="SolutionAddIn.dll" size="10752">
    <assemblyIdentity name="SolutionAddIn" version="1.0.0.0"
    publicKeyToken="B066060CC54477C1" language="neutral" processorArchitecture="msil" />
    <hash>
      <dsig:Transforms>
        <dsig:Transform Algorithm="urn:schemas-microsoft-com:HashTransforms.Identity" />
      </dsig:Transforms>
      <dsig:DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
      <dsig:DigestValue>UwfhkV3zY6EMHgP00BmYMA9cFJY=</dsig:DigestValue>
    </hash>
  </dependentAssembly>
</dependency>
<file name="file.txt" size="3">
  <hash>
    <dsig:Transforms>
      <dsig:Transform Algorithm="urn:schemas-microsoft-com:HashTransforms.Identity" />
    </dsig:Transforms>
    <dsig:DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
    <dsig:DigestValue>VyGMMWtpIeLNYQJ6I4ftwxotlHE=</dsig:DigestValue>
  </hash>
</file>
<vstav3:addIn xmlns:vstav3="urn:schemas-microsoft-com:vsta.v3">
  <vstav3:entryPointsCollection xmlns:vstav3="urn:schemas-microsoft-com:vsta.v3">
    <vstav3:entryPoints>
      <vstav3:entryPoint class="SolutionAddIn.ThisAddIn">
        <assemblyIdentity name="SolutionAddIn" version="1.0.0.0"
        publicKeyToken="B066060CC54477C1" language="neutral" processorArchitecture="msil" />
      </vstav3:entryPoint>
    </vstav3:entryPoints>
  </vstav3:entryPointsCollection>
  <vstav3:update enabled="false" xmlns:vstav3="urn:schemas-microsoft-com:vsta.v3" />
  <vstav3:postActions xmlns:vstav3="urn:schemas-microsoft-com:vsta.v3">
    <vstav3:postAction>
      <vstav3:entryPoint class="SolutionAddIn.SolutionDeploymentPostAction">
        <assemblyIdentity name="SolutionAddIn" version="1.0.0.0"
        publicKeyToken="94de0004b6e3fcc5" language="neutral" processorArchitecture="msil" />
      </vstav3:entryPoint>
      <vstav3:postActionData>
      </vstav3:postActionData>
    </vstav3:postAction>
  </vstav3:postActions>
  <vstav3:application xmlns:vstav3="urn:schemas-microsoft-com:vsta.v3">
    <vstov4:customizations xmlns:vstov4="urn:schemas-microsoft-com:vsto.v4">
      <vstov4:customization>
        <vstov4:appAddIn application="Outlook" loadBehavior="2" keyName="OutlookAddIn1">
          <vstov4:friendlyName>OutlookAddIn1</vstov4:friendlyName>
          <vstov4:description>OutlookAddIn1</vstov4:description>
        </vstov4:appAddIn>
      </vstov4:customization>
    </vstov4:customizations>
  </vstav3:application>
</vstav3:addIn>
  <publisherIdentity name="CN=domain\user_name"
  issuerKeyHash="9c928594208093ebb2e5ef59a0741d206f531315" />
  <Signature Id="StrongNameSignature" xmlns="http://www.w3.org/2000/09/xmldsig#">
    <SignedInfo>
      <CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
      <SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1" />
      <Reference URI="">
        <Transforms>
          <Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature" />
          <Transform Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
        </Transforms>
        <DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
        <DigestValue>aexIJyGPdjKGXNblIPnuDJY3s=</DigestValue>
      </Reference>
    </SignedInfo>
  </Signature>

```

```

<SignatureValue>R5zs62eeKbJyHooS5YDvKbiBzixFFMvQ5VynRND2MguZe3phsuCwHvRwZVs+eDq0bU1SfscsI69c0
+R/olM6wfmpvrodNVA6xSI33Udl7GDJemKS7o/0nQaiOjXnD8tB9/hIoeZP5D5Zic6LbX8bzXtickKV2HmQiKmaZqXgY
8=</SignatureValue>
  <KeyInfo Id="StrongNameKeyInfo">
    <KeyValue>
      <RSAKeyValue>

<Modulus>3WAAL94VOOQBWMFmGR5520LjqvUfZZ5x8mXBy1xIj5SNwwiLZCFcDEn3jWFC/QyII0jbsRh7t6/UjojvKJ
9q0IOMZH7LiREiCQytbQZhtlRt8cgpP3Vbob9ChKuKbA8QrvisaFmjniOLyT3T46Wd3ywF3prqGXQmcXuRcaRIjc=</Mod
ulus>
  <Exponent>AQAB</Exponent>
</RSAKeyValue>
</KeyValue>
  <msrel:RelData xmlns:msrel="http://schemas.microsoft.com/windows/rel/2005/reldata">
    <r:license xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
xmlns:as="http://schemas.microsoft.com/windows/pki/2005/Authenticode">
      <r:grant>
        <as:ManifestInformation Hash="7b63c9e09e0f526fe77518cad83dc6272748ec69"
Description="" Url="">
          <as:assemblyIdentity name="SolutionAddIn.dll" version="1.0.0.0"
publicKeyToken="b066060cc54477c1" language="neutral" processorArchitecture="msil"
type="win32" />
        </as:ManifestInformation>
        <as:SignedBy />
        <as:AuthenticodePublisher>
          <as:X509SubjectName>CN=domain\user_name</as:X509SubjectName>
        </as:AuthenticodePublisher>
      </r:grant>
      <r:issuer>
        <Signature Id="AuthenticodeSignature" xmlns="http://www.w3.org/2000/09/xmldsig#">
          <SignedInfo>
            <CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#"
/>
            <SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1" />
            <Reference URI="">
              <Transforms>
                <Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-
signature" />
                <Transform Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#" />
              </Transforms>
              <DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1" />
              <DigestValue>ZdHni7uhJluZnODxK0NqWPRYdDE=</DigestValue>
            </Reference>
          </SignedInfo>

<SignatureValue>oGL8ICFBIXxTbjKliRwzidKGUhl4VbleFhrjGxEFRtp+R2x4V+AmJxgM8d7qe2bS2ifqHJbJA3lph
QG2e0it4PyZrQCJTPc3TNnmz837wnqaf7tT2U8KNc8W+apaNs8z+QCHIuGyOZZCzZ/RjX/o5lph8FgvlqVvWQtPTABpt8
U=</SignatureValue>
  <KeyInfo>
    <KeyValue>
      <RSAKeyValue>

<Modulus>3WAAL94VOOQBWMFmGR5520LjqvUfZZ5x8mXBy1xIj5SNwwiLZCFcDEn3jWFC/QyII0jbsRh7t6/UjojvKJ
9q0IOMZH7LiREiCQytbQZhtlRt8cgpP3Vbob9ChKuKbA8QrvisaFmjniOLyT3T46Wd3ywF3prqGXQmcXuRcaRIjc=</Mod
ulus>
  <Exponent>AQAB</Exponent>
</RSAKeyValue>
</KeyValue>
<X509Data>

<X509Certificate>MIIB6jCCAVegAwIBAgIQ/K/TJGThnqRP5PtyhbWtljAJBgUrDgMCHQUAMCsxKTAnBgNVBAMEIABS
AEUARABNAE8ATgBEAFwAYgBpPAGEAcABwAGwAYQBIMB4XDTA5MDUyNjE3MTkyOFoXDTM5MDEwMjAwMDAwMFowKzEpMCCGA
1UEAx4gAFIARQBEBEAOATwBOAEQAXABiAGkAYQBWAAAAAbABhAGIwZ8wDQYJKoZIhvcNAQEBBQADgY0AMIGJAoGBANlgAC
/eFTjkAVjBZhkeedji46r1LX2WecfJlwctcSI+UjcMIi2QhXAxJ941hQv0MiCNI27EYe7ev1I6I3FZCfatCDjGR+y4kRI
gkMrW0GYbZUbfHID9lW6G/QoSrimwPEK74rGhZo54jji8k90+0lnd8sBd6a6hl0JnF7kXGkSI3AgMBAAGjFzAVMBMGA1Ud
JQQMAoGCCsGAQUFBwMDMAkGBSsOAwIdBQADgYEALAHoz8X1R8tq25KzulhX3VclbhtoeoPBPM0WT/eCTRqqUY6xUO+9T
7e/tHWC/cXKpGmBa34fT8BOzX61vPsk8xhLtEqJ8uvgn/K6pBU3rYjNtk9mblyPPWni0/ALzdQEFYEa5hjbNggIjDqLzK
YuNvpCzJK/TFdX4HH+FDTBkRA=</X509Certificate>

```

```
        </X509Data>
      </KeyInfo>
    </Signature>
  </r:issuer>
</r:license>
</msrel:RelData>
</KeyInfo>
</Signature>
</asmv1:assembly>
```

The hashes and signature information in this sample have to be updated to match the customization assemblies, dependent files, and certificate being used.

4 Security

4.1 Security Considerations for Implementers

This structure simply represents a set of XML files. Implementations that process XML files contained in this format ought to guard against the same kinds of threats that occur when processing other XML files.

This structure uses the SHA-1 hashing algorithm for the **hash** of files in the **deployment package**. The **application manifest** contains a hash for all the **package files** that are referenced (section [2.2.2.3.4](#)). The **deployment manifest** contains a hash of the application manifest (section [2.1.2.3.4](#)).

The deployment package requests the unrestricted **code access security permission set**, any executable code that is deployed with the package runs with this permission set (section [2.2.2.3.12](#)).

4.1.1 Digital Signatures

To provide the evidence for the **deployment package**, both manifests contain a publisherIdentityType (section [2.1.2.3.6](#) and section [2.2.2.3.9](#)) and are signed using XML signatures as specified by section [2.3](#), section [2.4](#) and section [2.5](#) – see signature element in assemblyType (section [2.1.1.3.3](#) and section [2.2.1.3.2](#)).

4.2 Index of Security Fields

| Security fields | Section |
|---|---|
| The deployment manifest contains a hash of the application manifest | 2.1.2.3.4 |
| The application manifest contains a hash for all the package files | 2.2.2.3.4 |
| Both manifests contain a publisherIdentityType | 2.1.2.3.6 , 2.2.2.3.9 |
| Signature element in assemblyType | 2.1.1.3.3 , 2.2.1.3.2 |
| Strong Name Signature | 2.3 |
| Software Publisher Signature | 2.4 |
| Algorithms | 2.5 |

5 Appendix A: Full XML Schema

5.1 Deployment Manifest XML Schema

File: asm.xsd

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns="urn:schemas-microsoft-com:asm.v1" xmlns:asm.v2="urn:schemas-microsoft-com:asm.v2" xmlns:asm.v1="urn:schemas-microsoft-com:asm.v1" xmlns:clickonce.v2="urn:schemas-microsoft-com:clickonce.v2" xmlns:xrml="http://www.xrml.org/schema/2001/11/xrml2core" xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS" xmlns:enc="http://www.w3.org/2001/04/xmlenc#" xmlns:ds="http://www.w3.org/2000/09/xmldsig#" targetNamespace="urn:schemas-microsoft-com:asm.v1" elementFormDefault="qualified" attributeFormDefault="unqualified" >
  <xs:include schemaLocation="asm.v1.types.xsd" />
  <xs:include schemaLocation="co.v2.types.xsd" />
  <xs:import namespace="urn:schemas-microsoft-com:asm.v2" schemaLocation="asm.v2.types.xsd" />
  <xs:import namespace="http://www.w3.org/2000/09/xmldsig#" schemaLocation="external/xmldsig-core-schema.0.0.0.2.xsd" />
  <xs:element name="assembly" type="assemblyType" >
  </xs:element>
  <xs:complexType name="assemblyType" >
    <xs:sequence>
      <xs:element name="assemblyIdentity" type="asm.v1:assemblyIdentityType" />
      <xs:element name="description" type="descriptionType" />
      <xs:element ref="asm.v2:deployment" />
      <xs:element ref="clickonce.v2:compatibleFrameworks" />
      <xs:element ref="asm.v2:dependency" />
      <xs:element ref="asm.v2:publisherIdentity" />
      <xs:element ref="ds:Signature" />
    </xs:sequence>
    <xs:attribute name="manifestVersion" type="asm.v1:twoPartVersionType" use="required" fixed="1.0" />
  </xs:complexType>
</xs:schema>
```

File: asm.v1.types.xsd

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:asm.v1="urn:schemas-microsoft-com:asm.v1" xmlns:asm.v2="urn:schemas-microsoft-com:asm.v2" targetNamespace="urn:schemas-microsoft-com:asm.v1" attributeFormDefault="unqualified" elementFormDefault="qualified" xmlns:xs="http://www.w3.org/2001/XMLSchema" >
  <xs:import namespace="urn:schemas-microsoft-com:asm.v2" schemaLocation="asm.v2.types.xsd" />
  <xs:simpleType name="twoPartVersionType" >
    <xs:restriction base="xs:string">
      <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\. (0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])" />
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="publicKeyTokenType" >
    <xs:restriction base="xs:string">
      <xs:pattern value="([0-9]|[a-f]|[A-F]){16}" />
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="fourPartVersionType" >
    <xs:restriction base="xs:string">
      <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\. (0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\. (0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-
```

```

9}{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-
4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])" />
</xs:restriction>
</xs:simpleType>
<xs:simpleType name="fileNameStringType" >
<xs:restriction base="xs:string">
<xs:pattern value="([\u0020][\u0021][\u0024][\u0025][\u0027-\u0029][\u002B-
\u002E][\u0030-\u0039][\u003B][\u003D][\u0040-\u005B][\u005D-\u007B][\u007D-
\uFFFF][\u10000-\u10FFFF])*" />
</xs:restriction>
</xs:simpleType>
<xs:complexType name="assemblyIdentityType" >
<xs:attribute name="name" type="asm.v1:fileNameStringType" use="required" />
<xs:attribute name="version" type="asm.v1:fourPartVersionType" use="required" />
<xs:attribute name="processorArchitecture" type="xs:string" use="required"
fixed="msil" />
<xs:attribute name="publicKeyToken" type="asm.v1:publicKeyTokenType" use="required"
/>
<xs:attribute name="language" type="xs:string" use="required" fixed="neutral" />
</xs:complexType>
<xs:complexType name="descriptionType" mixed="true" >
<xs:attribute ref="asm.v2:publisher" use="required" />
<xs:attribute ref="asm.v2:product" use="required" />
</xs:complexType>
</xs:schema>

```

File: asm.v2.types.xsd

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema targetNamespace="urn:schemas-microsoft-com:asm.v2"
attributeFormDefault="unqualified" elementFormDefault="qualified"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
xmlns:asm.v2="urn:schemas-microsoft-com:asm.v2">
<xs:import namespace="http://www.w3.org/2000/09/xmldsig#" schemaLocation="external/xmldsig-
core-schema.0.0.0.2.xsd" />
<xs:attribute name="publisher" type="asm.v2:fileNameStringType" fixed="DefaultPublisher" />
<xs:attribute name="product" type="asm.v2:fileNameStringType" />
<xs:element name="deployment" type="asm.v2:deploymentType" />
<xs:element name="dependency" type="asm.v2:dependencyType"/>
<xs:element name="publisherIdentity" type="asm.v2:publisherIdentityType" />
<xs:simpleType name="fourPartVersionType" >
<xs:restriction base="xs:string">
<xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-
9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-
4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-
9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-
4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])" />
</xs:restriction>
</xs:simpleType>
<xs:simpleType name="fileNameStringType" >
<xs:restriction base="xs:string">
<xs:pattern value="([\u0020][\u0021][\u0024][\u0025][\u0027-\u0029][\u002B-
\u002E][\u0030-\u0039][\u003B][\u003D][\u0040-\u005B][\u005D-\u007B][\u007D-
\uFFFF][\u10000-\u10FFFF])*" />
</xs:restriction>
</xs:simpleType>
<xs:simpleType name="publicKeyTokenType" >
<xs:restriction base="xs:string">
<xs:pattern value="([0-9]|[a-f]|[A-F]){16}" />
</xs:restriction>
</xs:simpleType>
<xs:complexType name="deploymentType" >
<xs:attribute name="install" type="xs:boolean" use="required" fixed="false" />
<xs:attribute name="mapFileExtensions" type="xs:boolean" use="optional" default="false"
/>
</xs:complexType>
<xs:complexType name="dependencyType" >
<xs:sequence>

```

```

        <xs:choice>
          <xs:element name="dependentAssembly" type="asm.v2:dependentAssemblyType" />
        </xs:choice>
      </xs:sequence>
    </xs:complexType>
    <xs:complexType name="dependentAssemblyType" >
      <xs:sequence>
        <xs:element name="assemblyIdentity" type="asm.v2:assemblyIdentityType" />
        <xs:element name="hash" type="asm.v2:hashType" minOccurs="0" maxOccurs="unbounded" />
      </xs:sequence>
      <xs:attribute name="dependencyType" type="xs:string" use="required" fixed="install" />
      <xs:attribute name="codebase" type="xs:anyURI" />
      <xs:attribute name="size" type="xs:integer" use="optional" />
    </xs:complexType>
    <xs:complexType name="hashType" >
      <xs:complexContent>
        <xs:extension base="ds:ReferenceType">
          <xs:sequence>
            <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded" />
          </xs:sequence>
        </xs:extension>
      </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="assemblyIdentityType" >
      <xs:attribute name="name" type="asm.v2:fileNameStringType" use="required" />
      <xs:attribute name="version" type="asm.v2:fourPartVersionType" use="required" />
      <xs:attribute name="type" type="xs:string" use="optional" fixed="win32" />
      <xs:attribute name="processorArchitecture" type="xs:string" use="required" fixed="msil"
/>
      <xs:attribute name="publicKeyToken" type="asm.v2:publicKeyTokenType" use="required" />
      <xs:attribute name="language" type="xs:string" use="required" fixed="neutral" />
    </xs:complexType>
    <xs:complexType name="publisherIdentityType" >
      <xs:attribute name="name" type="xs:string" />
      <xs:attribute name="issuerKeyHash" type="xs:string" />
    </xs:complexType>
  </xs:schema>

```

File: co.v2.xsd

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:clickonce.v2="urn:schemas-
microsoft-com:clickonce.v2" xmlns:asm.v2="urn:schemas-microsoft-com:asm.v2"
targetNamespace="urn:schemas-microsoft-com:clickonce.v2"
xmlns:odoc="http://schemas.microsoft.com/internal/obd" elementFormDefault="qualified">

  <xs:simpleType name="profileType">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Full"/>
      <xs:enumeration value="Client"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="twoPartVersionType">
    <xs:restriction base="xs:string">
      <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-
9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-
4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])" />
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="threePartVersionType">
    <xs:restriction base="xs:string">
      <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-
9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-

```

```

4] [0-9] {2} |0*655 [0-2] [0-9] |0*6553 [0-5] ) \. (0* [0-9] {1,4} |0* [1-5] [0-9] {4} |0*6 [0-4] [0-
9] {3} |0*65 [0-4] [0-9] {2} |0*655 [0-2] [0-9] |0*6553 [0-5] ) " />
</xs:restriction>
</xs:simpleType>

<xs:complexType name="frameworkType">
  <xs:attribute name="targetVersion" type="clickonce.v2:twoPartVersionType"
use="required"/>
  <xs:attribute name="profile" type="clickonce.v2:profileType" use="required"/>
  <xs:attribute name="supportedRuntime" type="clickonce.v2:threePartVersionType"
use="required"/>
</xs:complexType>

<xs:complexType name="compatibleFrameworksType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="framework" type="clickonce.v2:frameworkType" minOccurs="1"
maxOccurs="unbounded"/>
    </xs:choice>
  </xs:sequence>
</xs:complexType>

<xs:element name="compatibleFrameworks" type="clickonce.v2:compatibleFrameworksType"/>
</xs:schema>

```

5.2 Application Manifest XML Schema

File: asm.xsd

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:vsta.v3="urn:schemas-microsoft-
com:vsta.v3" xmlns="urn:schemas-microsoft-com:asm.v1" xmlns:asm.v3="urn:schemas-microsoft-
com:asm.v3" xmlns:asm.v2="urn:schemas-microsoft-com:asm.v2" xmlns:asm.v1="urn:schemas-
microsoft-com:asm.v1" xmlns:xrml="http://www.xrml.org/schema/2001/11/xrml2core"
xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS" xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
xmlns:enc="http://www.w3.org/2001/04/xmlenc#" targetNamespace="urn:schemas-microsoft-
com:asm.v1" elementFormDefault="qualified" attributeFormDefault="unqualified" >
  <xs:import namespace="http://www.w3.org/2000/09/xmldsig#"
schemaLocation="external/xmldsig-core-schema.0.0.0.2.xsd" />
  <xs:include schemaLocation="asm.v1.types.xsd" />
  <xs:import namespace="urn:schemas-microsoft-com:asm.v2" schemaLocation="asm.v2.types.xsd"
/>
  <xs:import namespace="urn:schemas-microsoft-com:vsta.v3" schemaLocation="vsta.v3.xsd" />
  <xs:element name="assembly" type="assemblyType" >
  </xs:element>
  <xs:complexType name="assemblyType" >
    <xs:sequence>
      <xs:element name="assemblyIdentity" type="asm.v1:assemblyIdentityType" />
      <xs:element ref="asm.v2:application" />
      <xs:element ref="asm.v2:entryPoint" />
      <xs:element ref="asm.v2:trustInfo" />
      <xs:element ref="asm.v2:dependency" minOccurs="0" maxOccurs="24575" />
      <xs:element ref="asm.v2:file" minOccurs="0" maxOccurs="24575" />
      <xs:element ref="vsta.v3:addIn" />
      <xs:element ref="asm.v2:publisherIdentity" />
      <xs:element ref="ds:Signature" />
    </xs:sequence>
    <xs:attribute name="manifestVersion" type="asm.v1:twoPartVersionType" use="required"
fixed="1.0" />
  </xs:complexType>
</xs:schema>

```

File: asm.v1.types.xsd

```

<?xml version="1.0" encoding="utf-8"?>

```

```

<xs:schema xmlns:asm.v1="urn:schemas-microsoft-com:asm.v1" xmlns:asm.v2="urn:schemas-
microsoft-com:asm.v2" targetNamespace="urn:schemas-microsoft-com:asm.v1"
attributeFormDefault="unqualified" elementFormDefault="qualified"
xmlns:xs="http://www.w3.org/2001/XMLSchema" >
  <xs:import namespace="urn:schemas-microsoft-com:asm.v2" schemaLocation="asm.v2.types.xsd"
  />
  <xs:simpleType name="twoPartVersionType" >
    <xs:restriction base="xs:string">
      <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-
9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-
4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])" />
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="publicKeyTokenType" >
    <xs:restriction base="xs:string">
      <xs:pattern value="([0-9]|[a-f]|[A-F]){16}" />
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="fourPartVersionType" >
    <xs:restriction base="xs:string">
      <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-
9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-
4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-
9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\.(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-
4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])" />
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="fileNameStringType" >
    <xs:restriction base="xs:string">
      <xs:pattern value="([\u0020]|\[\u0021]|\[\u0024]|\[\u0025]|\[\u0027-\u0029]|\[\u002B-
\u002E]|\[\u0030-\u0039]|\[\u003B]|\[\u003D]|\[\u0040-\u005B]|\[\u005D-\u007B]|\[\u007D-
\uFFFF]|\[\u10000-\u10FFFF])*" />
    </xs:restriction>
  </xs:simpleType>
  <xs:complexType name="assemblyIdentityType" >
    <xs:attribute name="name" type="asm.v1:fileNameStringType" use="required" />
    <xs:attribute name="version" type="asm.v1:fourPartVersionType" use="required" />
    <xs:attribute name="type" type="xs:string" use="optional" fixed="win32" />
    <xs:attribute name="processorArchitecture" type="xs:string" use="required"
    fixed="msil" />
    <xs:attribute name="publicKeyToken" type="asm.v1:publicKeyTokenType" use="required"
  />
  />
  <xs:attribute name="language" type="xs:string" use="required" fixed="neutral" />
</xs:complexType>
</xs:schema>

```

File: asm.v2.types.xsd

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema targetNamespace="urn:schemas-microsoft-com:asm.v2"
attributeFormDefault="unqualified" elementFormDefault="qualified"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
xmlns:asm.v2="urn:schemas-microsoft-com:asm.v2" xmlns:asm.v3="urn:schemas-microsoft-
com:asm.v3" xmlns:co.v1="urn:schemas-microsoft-com:clickonce.v1" >
  <xs:import namespace="http://www.w3.org/2000/09/xmldsig#" schemaLocation="external/xmldsig-
core-schema.0.0.0.2.xsd" />
  <xs:import namespace="urn:schemas-microsoft-com:clickonce.v1" schemaLocation="co.v1.xsd" />
  <xs:import namespace="urn:schemas-microsoft-com:asm.v3" schemaLocation="asm.v3.types.xsd"
  />
  <xs:element name="application" type="asm.v2:applicationType" />
  <xs:element name="entryPoint" type="asm.v2:entryPointType" />
  <xs:element name="trustInfo" type="asm.v2:trustInfoType" />
  <xs:element name="dependency" type="asm.v2:dependencyType" />
  <xs:element name="file" type="asm.v2:fileType" />
  <xs:element name="assemblyIdentity" type="asm.v2:assemblyIdentityType" />
  <xs:element name="publisherIdentity" type="asm.v2:publisherIdentityType" />
  <xs:complexType name="applicationType" />

```

```

<xs:complexType name="dependencyType" >
  <xs:sequence>
    <xs:choice>
      <xs:element name="dependentAssembly" type="asm.v2:dependentAssemblyType" />
      <xs:element name="dependentOS" type="asm.v2:dependentOSType" />
    </xs:choice>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="dependentAssemblyType" >
  <xs:sequence>
    <xs:element name="assemblyIdentity" type="asm.v2:assemblyIdentityType" />
    <xs:element name="hash" type="asm.v2:hashType" minOccurs="0" maxOccurs="unbounded" />
  </xs:sequence>
  <xs:attribute name="dependencyType" type="asm.v2:dependencyTypeType" use="optional"
  default="preRequisite" />
  <xs:attribute name="codebase" type="xs:anyURI" />
  <xs:attribute name="size" type="xs:integer" use="optional" />
  <xs:attribute name="allowDelayedBinding" type="xs:boolean" use="required" fixed="true"
/>
</xs:complexType>
<xs:complexType name="hashType" >
  <xs:complexContent>
    <xs:extension base="ds:ReferenceType">
      <xs:sequence>
        <xs:any namespace="##other" processContents="lax" minOccurs="0"
maxOccurs="unbounded" />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="dependentOSType" >
  <xs:sequence>
    <xs:element name="osVersionInfo" type="asm.v2:osVersionInfoType" />
  </xs:sequence>
</xs:complexType>
<xs:complexType name="osVersionInfoType" >
  <xs:sequence>
    <xs:element name="os" type="asm.v2:osType" />
  </xs:sequence>
</xs:complexType>
<xs:complexType name="osType" >
  <xs:attribute name="majorVersion" type="asm.v2:TwoByteVersion" use="required" fixed="4"
/>
  <xs:attribute name="minorVersion" type="asm.v2:TwoByteVersion" use="required" fixed="10"
/>
  <xs:attribute name="buildNumber" type="asm.v2:TwoByteVersion" use="required" fixed="0"
/>
  <xs:attribute name="servicePackMajor" type="asm.v2:OneByteVersion" use="required"
fixed="0" />
</xs:complexType>
<xs:simpleType name="TwoByteVersion" >
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0" />
    <xs:maxInclusive value="65535" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="OneByteVersion" >
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0" />
    <xs:maxInclusive value="255" />
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="dependencyTypeType" >
  <xs:restriction base="xs:string">
    <xs:enumeration value="preRequisite" />
    <xs:enumeration value="install"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="fileNameStringType" >

```

```

        <xs:restriction base="xs:string">
            <xs:pattern value="([\u0020]|\u0021|\u0024|\u0025|\u0027-\u0029|\u002B-\u002E)|[\u0030-\u0039)|[\u003B)|[\u003D)|[\u0040-\u005B)|[\u005D-\u007B)|[\u007D-\u00FFD)|[\u10000-\u10FFFF])*" />
        </xs:restriction>
    </xs:simpleType>
    <xs:complexType name="assemblyIdentityType" >
        <xs:attribute name="name" type="asm.v2:fileNameStringType" use="required" />
        <xs:attribute name="version" type="asm.v2:fourPartVersionType" use="required" />
        <xs:attribute name="type" type="xs:string" use="optional" fixed="win32" />
        <xs:attribute name="processorArchitecture" type="xs:string" use="optional" fixed="msil" />
        <xs:attribute name="publicKeyToken" type="asm.v2:publicKeyTokenType" use="optional" />
        <xs:attribute name="language" type="xs:string" use="optional" fixed="neutral" />
    </xs:complexType>
    <xs:simpleType name="fourPartVersionType" >
        <xs:restriction base="xs:string">
            <xs:pattern value="(0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\. (0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\. (0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])\. (0*[0-9]{1,4}|0*[1-5][0-9]{4}|0*6[0-4][0-9]{3}|0*65[0-4][0-9]{2}|0*655[0-2][0-9]|0*6553[0-5])" />
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="publicKeyTokenType" >
        <xs:restriction base="xs:string">
            <xs:pattern value="([0-9]|[a-f]|[A-F]){16}" />
        </xs:restriction>
    </xs:simpleType>
    <xs:complexType name="publisherIdentityType" >
        <xs:attribute name="name" type="xs:string" />
        <xs:attribute name="issuerKeyHash" type="xs:string" />
    </xs:complexType>
    <xs:complexType name="entryPointType" >
        <xs:sequence>
            <xs:element ref="co.v1:customHostSpecified" />
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="trustInfoType" >
        <xs:sequence>
            <xs:element name="security" type="asm.v2:securityType" />
            <xs:element ref="asm.v3:asmv3" minOccurs="0" />
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="securityType" >
        <xs:sequence>
            <xs:element name="applicationRequestMinimum" type="asm.v2:applicationRequestMinimumType" />
            <xs:element name="requestedPrivileges" type="asm.v3:requestedPrivilegesType" />
            <xs:element ref="asm.v3:asmv3" minOccurs="0" />
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="applicationRequestMinimumType" >
        <xs:sequence>
            <xs:element name="PermissionSet" type="asm.v2:PermissionSetType" />
            <xs:element name="defaultAssemblyRequest" type="asm.v2:defaultAssemblyRequestType" />
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="PermissionSetType" >
        <xs:attribute name="ID" type="xs:ID" use="required" />
        <xs:attribute name="Unrestricted" type="xs:boolean" use="required" fixed="true" />
        <xs:attribute name="SameSite" type="xs:string" use="required" fixed="site" />
    </xs:complexType>
    <xs:complexType name="defaultAssemblyRequestType" >
        <xs:attribute name="permissionSetReference" type="xs:IDREF" />
    </xs:complexType>
    <xs:complexType name="fileType" >
        <xs:choice minOccurs="0" maxOccurs="unbounded">
            <xs:element name="hash" type="asm.v2:hashType" />
        </xs:choice>
    </xs:complexType>

```

```

    </xs:choice>
    <xs:attribute name="name" type="xs:string" use="required" />
    <xs:attribute name="size" type="xs:unsignedLong" use="required" />
  </xs:complexType>
</xs:schema>

```

File: asm.v3.types.xsd

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:asm.v3="urn:schemas-microsoft-com:asm.v3" targetNamespace="urn:schemas-
microsoft-com:asm.v3" attributeFormDefault="unqualified" elementFormDefault="qualified"
xmlns:xs="http://www.w3.org/2001/XMLSchema" >
  <xs:element name="asmv3" type="asm.v3:asmv3Type" />
  <xs:complexType name="requestedPrivilegesType" >
    <xs:sequence>
      <xs:element name="requestedExecutionLevel" type="asm.v3:requestedExecutionLevelType" />
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="requestedExecutionLevelType" >
    <xs:attribute name="level" type="xs:string" use="required" fixed="asInvoker" />
  </xs:complexType>
  <xs:complexType name="asmv3Type" >
    <xs:sequence>
      <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##any" processContents="skip" />
    </xs:sequence>
  </xs:complexType>
</xs:schema>

```

File: co.v1.xsd

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:co.v1="urn:schemas-microsoft-
com:clickonce.v1" targetNamespace="urn:schemas-microsoft-com:clickonce.v1" >
  <xs:element name="customHostSpecified" type="co.v1:customHostSpecifiedType" />
  <xs:complexType name="customHostSpecifiedType" />
</xs:schema>

```

File: vsta.v3.xsd

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:asm.v2="urn:schemas-microsoft-
com:asm.v2" xmlns:vsto.v4="urn:schemas-microsoft-com:vsto.v4" xmlns:vsta.v3="urn:schemas-
microsoft-com:vsta.v3" targetNamespace="urn:schemas-microsoft-com:vsta.v3"
attributeFormDefault="unqualified" elementFormDefault="qualified" >
  <xs:import namespace="urn:schemas-microsoft-com:asm.v2" schemaLocation="asm.v2.types.xsd"
  />
  <xs:import namespace="urn:schemas-microsoft-com:vsto.v4" schemaLocation="vsto.v4.xsd" />
  <xs:element name="addIn" type="vsta.v3:addInType" />
  <xs:complexType name="addInType" >
    <xs:sequence>
      <xs:element name="entryPointsCollection" type="vsta.v3:entryPointsCollectionType"
minOccurs="1" maxOccurs="1" />
      <xs:element name="update" type="vsta.v3:updateType" maxOccurs="1" minOccurs="1" />
      <xs:element name="postActions" type="vsta.v3:postActionsType" maxOccurs="1"
minOccurs="0" />
      <xs:element name="application" type="vsta.v3:applicationType" maxOccurs="1"
minOccurs="0" />
      <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
  />
    </xs:sequence>
  <xs:anyAttribute namespace="##other" processContents="skip" />
</xs:complexType>
  <xs:complexType name="entryPointsCollectionType" >

```



```

        <xs:sequence>
          <xs:element name="entryPoints" type="vsta.v3:entryPointsType" minOccurs="1"
maxOccurs="unbounded" />
          <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
/>
        </xs:sequence>
        <xs:anyAttribute namespace="##other" processContents="skip" />
      </xs:complexType>
      <xs:complexType name="entryPointsType" >
        <xs:sequence>
          <xs:element name="entryPoint" type="vsta.v3:entryPointType" maxOccurs="unbounded" />
          <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
/>
        </xs:sequence>
        <xs:attribute name="id" type="xs:string" use="optional" />
        <xs:anyAttribute namespace="##other" processContents="skip" />
      </xs:complexType>
      <xs:complexType name="entryPointType" mixed="true" >
        <xs:sequence minOccurs="1" maxOccurs="1">
          <xs:element ref="asm.v2:assemblyIdentity" />
          <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
/>
        </xs:sequence>
        <xs:attribute name="class" type="xs:string" use="required" />
        <xs:anyAttribute namespace="##other" processContents="skip" />
      </xs:complexType>
      <xs:complexType name="postActionEntryPointType" mixed="true" >
        <xs:sequence minOccurs="1" maxOccurs="1">
          <xs:element ref="asm.v2:assemblyIdentity" />
          <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
/>
        </xs:sequence>
        <xs:attribute name="class" type="xs:string" use="required" />
        <xs:anyAttribute namespace="##other" processContents="skip" />
      </xs:complexType>
      <xs:complexType name="updateType" >
        <xs:sequence>
          <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
/>
        </xs:sequence>
        <xs:attribute name="enabled" type="xs:boolean" use="required" fixed="false" />
        <xs:anyAttribute namespace="##other" processContents="skip" />
      </xs:complexType>
      <xs:complexType name="postActionsType" >
        <xs:sequence>
          <xs:element name="postAction" type="vsta.v3:postActionType" maxOccurs="unbounded"
minOccurs="0" />
          <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
/>
        </xs:sequence>
        <xs:anyAttribute namespace="##other" processContents="skip" />
      </xs:complexType>
      <xs:complexType name="postActionType" >
        <xs:sequence>
          <xs:element name="entryPoint" type="vsta.v3:postActionEntryPointType" maxOccurs="1"
minOccurs="1" />
          <xs:element name="postActionData" type="vsta.v3:postActionDataType" maxOccurs="1"
minOccurs="0" />
          <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
/>
        </xs:sequence>
        <xs:anyAttribute namespace="##other" processContents="skip" />
      </xs:complexType>
      <xs:complexType name="postActionDataType" >
        <xs:sequence>
          <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
/>
        </xs:sequence>
        <xs:anyAttribute namespace="##other" processContents="skip" />
      </xs:complexType>

```

```

</xs:complexType>
<xs:complexType name="applicationType" >
  <xs:sequence>
    <xs:element ref="vsto.v4:customizations" />
  </xs:sequence>
</xs:complexType>
</xs:schema>

```

File: vsto.v4.xsd

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:vsto.v4="urn:schemas-microsoft-com:vsto.v4"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="urn:schemas-microsoft-com:vsto.v4"
xmlns:xs="http://www.w3.org/2001/XMLSchema" >
  <xs:element name="customizations" type="vsto.v4:customizationsType" />
  <xs:complexType name="customizationsType" >
    <xs:sequence>
      <xs:element name="customization" type="vsto.v4:customizationType" minOccurs="1"
maxOccurs="unbounded" />
      <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
/>
    </xs:sequence>
    <xs:anyAttribute namespace="##other" processContents="skip" />
  </xs:complexType>
  <xs:complexType name="customizationType" >
    <xs:sequence>
      <xs:choice minOccurs="1" maxOccurs="1">
        <xs:element name="appAddIn" type="vsto.v4:appAddInType" />
      </xs:choice>
      <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other" processContents="skip"
/>
    </xs:sequence>
    <xs:attribute name="id" type="xs:string" use="optional" />
    <xs:anyAttribute namespace="##other" processContents="skip" />
  </xs:complexType>
  <xs:complexType name="appAddInType" >
    <xs:sequence>
      <xs:element name="friendlyName" type="xs:string" maxOccurs="1" minOccurs="1"
/>
      <xs:element name="description" type="xs:string" maxOccurs="1" minOccurs="0" />
      <xs:any minOccurs="0" maxOccurs="unbounded" namespace="##other"
processContents="skip" />
    </xs:sequence>
    <xs:attribute name="application" type="xs:string" use="required" fixed="Outlook"
/>
    <xs:attribute name="loadBehavior" type="vsto.v4:loadBehaviorType" use="optional"
/>
    <xs:attribute name="keyName" type="vsto.v4:keyStringType" use="required" />
    <xs:anyAttribute namespace="##other" processContents="skip" />
  </xs:complexType>
  <xs:simpleType name="loadBehaviorType" >
    <xs:restriction base="xs:int">
      <xs:enumeration value="2" />
      <xs:enumeration value="3" />
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="keyStringType" >
    <xs:restriction base="xs:string">
      <xs:pattern value="(\u0020|\u0021|[\u0023-\u0029]|[\u002B-
\u0039]|[\u003B|\u003D]|[\u0040-\u005B]|[\u005D-\u007B]|[\u007D-\u007F]|[\u0000-
\uFFFF]|[\u10000-\u10FFFF])*" />
    </xs:restriction>
  </xs:simpleType>
</xs:schema>

```

5.3 http://schemas.microsoft.com/windows/pki/2005/Authenticode Schema

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema targetNamespace="http://schemas.microsoft.com/windows/pki/2005/Authenticode"
  elementFormDefault="qualified"
  xmlns="http://schemas.microsoft.com/windows/pki/2005/Authenticode"
  xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS" xmlns:asm.v1="urn:schemas-microsoft-com:asm.v1" >
  <xs:import namespace="urn:mpeg:mpeg21:2003:01-REL-R-NS"/>
  <xs:import namespace="urn:schemas-microsoft-com:asm.v1"/>
  <xs:import namespace="http://www.w3.org/2000/09/xmldsig#" />
  <xs:complexType name="ManifestInformationType">
    <xs:sequence>
      <xs:element name="assemblyIdentity" type="asm.v1:assemblyIdentityType"/>
    </xs:sequence>
    <xs:attribute name="Hash" type="ds:CryptoBinary" use="required"/>
    <xs:attribute name="Description" type="xs:string" use="optional"/>
    <xs:attribute name="Url" type="xs:anyURI" use="optional"/>
  </xs:complexType>
  <xs:complexType name="SignedByType">
    <xs:complexContent>
      <xs:restriction base="r:Right"/>
    </xs:complexContent>
  </xs:complexType>
  <xs:complexType name="AuthenticodePublisherType">
    <xs:sequence>
      <xs:element name="X509SubjectName" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
  <xs:element name="ManifestInformation" type="ManifestInformationType"/>
  <xs:element name="SignedBy" type="SignedByType"/>
  <xs:element name="AuthenticodePublisher" type="AuthenticodePublisherType"/>
  <xs:element name="Timestamp" type="ds:CryptoBinary"/>
</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 2010 suites
- Microsoft OneNote Online
- Microsoft PowerPoint Online
- Microsoft SharePoint Server 2010
- Microsoft SharePoint Workspace 2010
- Microsoft Office 2013
- Microsoft SharePoint Server 2013
- Microsoft Office 2016
- Microsoft SharePoint Server 2016
- Microsoft Office 2019
- Microsoft SharePoint Server 2019

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 2.1.3.1.1](#): Office 2010 does not support this type.

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.

| Section | Description | Revision class |
|--|--|----------------|
| 2.1.3.4.2 profileType | Clarified the description of the enumeration values. | Minor |
| 2.3.1.3.7 TransformsType | Clarified description of ds:Transform child element. | Minor |
| 2.4.3.3.7 TransformsType | Clarified description of ds:Transform child element. | Minor |
| 6 Appendix B: Product Behavior | Updated list of supported products. | Major |

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