

## [MS-OSCO]:

# Office Server ClickOnce Manifest Structure

---

### Intellectual Property Rights Notice for Open Specifications Documentation

- **Technical Documentation.** Microsoft publishes Open Specifications documentation (“this documentation”) for protocols, file formats, data portability, computer languages, and standards support. Additionally, overview documents cover inter-protocol relationships and interactions.
- **Copyrights.** This documentation is covered by Microsoft copyrights. Regardless of any other terms that are contained in the terms of use for the Microsoft website that hosts this documentation, you can make copies of it in order to develop implementations of the technologies that are described in this documentation and can distribute portions of it in your implementations that use these technologies or in your documentation as necessary to properly document the implementation. You can also distribute in your implementation, with or without modification, any schemas, IDLs, or code samples that are included in the documentation. This permission also applies to any documents that are referenced in the Open Specifications documentation.
- **No Trade Secrets.** Microsoft does not claim any trade secret rights in this documentation.
- **Patents.** Microsoft has patents that might cover your implementations of the technologies described in the Open Specifications documentation. Neither this notice nor Microsoft's delivery of this documentation grants any licenses under those patents or any other Microsoft patents. However, a given Open Specifications document might be covered by the Microsoft [Open Specifications Promise](#) or the [Microsoft Community Promise](#). If you would prefer a written license, or if the technologies described in this documentation are not covered by the Open Specifications Promise or Community Promise, as applicable, patent licenses are available by contacting [iplg@microsoft.com](mailto:iplg@microsoft.com).
- **License Programs.** To see all of the protocols in scope under a specific license program and the associated patents, visit the [Patent Map](#).
- **Trademarks.** The names of companies and products contained in this documentation might be covered by trademarks or similar intellectual property rights. This notice does not grant any licenses under those rights. For a list of Microsoft trademarks, visit [www.microsoft.com/trademarks](http://www.microsoft.com/trademarks).
- **Fictitious Names.** The example companies, organizations, products, domain names, email addresses, logos, people, places, and events that are depicted in this documentation are fictitious. No association with any real company, organization, product, domain name, email address, logo, person, place, or event is intended or should be inferred.

**Reservation of Rights.** All other rights are reserved, and this notice does not grant any rights other than as specifically described above, whether by implication, estoppel, or otherwise.

**Tools.** The Open Specifications documentation does not require the use of Microsoft programming tools or programming environments in order for you to develop an implementation. If you have access to Microsoft programming tools and environments, you are free to take advantage of them. Certain Open Specifications documents are intended for use in conjunction with publicly available standards specifications and network programming art and, as such, assume that the reader either is familiar with the aforementioned material or has immediate access to it.

**Support.** For questions and support, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com).

## Revision Summary

Date	Revision History	Revision Class	Comments
7/13/2009	0.1	Major	Initial Availability
8/28/2009	0.2	Major	Updated and revised the technical content
11/6/2009	0.3	Editorial	Revised and edited the technical content
2/19/2010	1.0	Editorial	Revised and edited the technical content
3/31/2010	1.01	Editorial	Revised and edited the technical content
4/30/2010	1.02	Editorial	Revised and edited the technical content
6/7/2010	1.03	Editorial	Revised and edited the technical content
6/29/2010	1.04	Editorial	Changed language and formatting in the technical content.
7/23/2010	1.04	None	No changes to the meaning, language, or formatting of the technical content.
9/27/2010	1.04	None	No changes to the meaning, language, or formatting of the technical content.
11/15/2010	1.04	None	No changes to the meaning, language, or formatting of the technical content.
12/17/2010	1.04	None	No changes to the meaning, language, or formatting of the technical content.
3/18/2011	1.04	None	No changes to the meaning, language, or formatting of the technical content.
6/10/2011	1.04	None	No changes to the meaning, language, or formatting of the technical content.
1/20/2012	1.5	Minor	Clarified the meaning of the technical content.
4/11/2012	1.5	None	No changes to the meaning, language, or formatting of the technical content.
7/16/2012	1.5	None	No changes to the meaning, language, or formatting of the technical content.
9/12/2012	1.5	None	No changes to the meaning, language, or formatting of the technical content.
10/8/2012	1.6	Minor	Clarified the meaning of the technical content.
2/11/2013	1.7	Minor	Clarified the meaning of the technical content.
7/30/2013	1.8	Minor	Clarified the meaning of the technical content.
11/18/2013	1.8	None	No changes to the meaning, language, or formatting of the technical content.
2/10/2014	1.8	None	No changes to the meaning, language, or formatting of the technical content.
4/30/2014	1.9	Minor	Clarified the meaning of the technical content.
7/31/2014	2.0	Major	Significantly changed the technical content.

<b>Date</b>	<b>Revision History</b>	<b>Revision Class</b>	<b>Comments</b>
10/30/2014	3.0	Major	Significantly changed the technical content.
3/16/2015	4.0	Major	Significantly changed the technical content.
2/26/2016	5.0	Major	Significantly changed the technical content.
7/15/2016	5.0	None	No changes to the meaning, language, or formatting of the technical content.
9/14/2016	5.0	None	No changes to the meaning, language, or formatting of the technical content.
6/20/2017	6.0	Major	Significantly changed the technical content.
12/12/2017	7.0	Major	Significantly changed the technical content.
7/24/2018	8.0	Major	Significantly changed the technical content.
10/1/2018	9.0	Major	Significantly changed the technical content.
4/22/2021	10.0	Major	Significantly changed the technical content.
7/20/2021	11.0	Major	Significantly changed the technical content.
8/17/2021	12.0	Major	Significantly changed the technical content.
10/5/2021	12.0	None	No changes to the meaning, language, or formatting of the technical content.

# Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>9</b>
1.1	Glossary .....	9
1.2	References .....	10
1.2.1	Normative References .....	10
1.2.2	Informative References .....	11
1.3	Overview .....	11
1.4	Relationship to Protocols and Other Structures .....	12
1.5	Applicability Statement .....	12
1.6	Versioning and Localization .....	12
1.7	Vendor-Extensible Fields .....	12
<b>2</b>	<b>Structures .....</b>	<b>13</b>
2.1	Deployment Manifest .....	13
2.1.1	Target namespace: urn:schemas-microsoft-com:asm.v1 .....	13
2.1.1.1	Global Elements .....	13
2.1.1.1.1	assembly .....	13
2.1.1.2	Global Attributes .....	13
2.1.1.3	Complex Types .....	13
2.1.1.3.1	assemblyIdentityType .....	13
2.1.1.3.2	descriptionType .....	14
2.1.1.3.3	assemblyType .....	14
2.1.1.4	Simple Types .....	15
2.1.1.4.1	twoPartVersionType .....	15
2.1.1.4.2	publicKeyTokenType .....	15
2.1.1.4.3	fourPartVersionType .....	16
2.1.1.4.4	fileNameStringType .....	16
2.1.2	Target Namespace urn:schemas-microsoft-com:asm.v2 .....	17
2.1.2.1	Global Elements .....	17
2.1.2.1.1	deployment .....	17
2.1.2.1.2	dependency .....	17
2.1.2.1.3	publisherIdentity .....	17
2.1.2.2	Global Attributes .....	17
2.1.2.2.1	publisher .....	17
2.1.2.2.2	product .....	17
2.1.2.3	Complex Types .....	18
2.1.2.3.1	deploymentType .....	18
2.1.2.3.2	dependencyType .....	18
2.1.2.3.3	dependentAssemblyType .....	18
2.1.2.3.4	hashType .....	19
2.1.2.3.5	assemblyIdentityType .....	20
2.1.2.3.6	publisherIdentityType .....	20
2.1.2.4	Simple Types .....	21
2.1.2.4.1	fourPartVersionType .....	21
2.1.2.4.2	fileNameStringType .....	21
2.1.2.4.3	publicKeyTokenType .....	21
2.1.3	Target namespace: urn:schemas-microsoft-com:clickonce.v2 .....	22
2.1.3.1	Global Elements .....	22
2.1.3.1.1	compatibleFrameworks .....	22
2.1.3.2	Global Attributes .....	22
2.1.3.3	Complex Types .....	22
2.1.3.3.1	compatibleFrameworksType .....	22
2.1.3.3.2	frameworkType .....	23
2.1.3.4	Simple Types .....	23
2.1.3.4.1	twoPartVersionType .....	23
2.1.3.4.2	profileType .....	24

2.1.3.4.3	threePartVersionType.....	24
2.2	Application Manifest .....	24
2.2.1	Target namespace: urn:schemas-microsoft-com:asm.v1 .....	25
2.2.1.1	Global Elements.....	25
2.2.1.1.1	assembly.....	25
2.2.1.2	Global Attributes.....	25
2.2.1.3	Complex Types .....	25
2.2.1.3.1	assemblyIdentityType .....	25
2.2.1.3.2	assemblyType .....	26
2.2.1.4	Simple Types.....	27
2.2.1.4.1	twoPartVersionType .....	27
2.2.1.4.2	publicKeyTokenType .....	27
2.2.1.4.3	fourPartVersionType .....	27
2.2.1.4.4	fileNameStringType .....	28
2.2.2	Target namespace: urn:schemas-microsoft-com:asm.v2 .....	28
2.2.2.1	Global Elements.....	28
2.2.2.1.1	application.....	28
2.2.2.1.2	entryPoint .....	28
2.2.2.1.3	trustInfo.....	28
2.2.2.1.4	dependency .....	29
2.2.2.1.5	file.....	29
2.2.2.1.6	assemblyIdentity.....	29
2.2.2.1.7	publisherIdentity .....	29
2.2.2.2	Global Attributes.....	29
2.2.2.3	Complex Types .....	29
2.2.2.3.1	applicationType .....	29
2.2.2.3.2	dependencyType .....	30
2.2.2.3.3	dependentAssemblyType .....	30
2.2.2.3.4	hashType .....	31
2.2.2.3.5	dependentOSType .....	31
2.2.2.3.6	osVersionInfoType .....	32
2.2.2.3.7	osType.....	32
2.2.2.3.8	assemblyIdentityType .....	33
2.2.2.3.9	publisherIdentityType .....	33
2.2.2.3.10	entryPointType.....	34
2.2.2.3.11	trustInfoType .....	34
2.2.2.3.12	securityType .....	34
2.2.2.3.13	applicationRequestMinimumType .....	35
2.2.2.3.14	PermissionSetType .....	35
2.2.2.3.15	defaultAssemblyRequestType .....	36
2.2.2.3.16	fileType.....	36
2.2.2.4	Simple Types.....	37
2.2.2.4.1	TwoByteVersion .....	37
2.2.2.4.2	OneByteVersion .....	37
2.2.2.4.3	dependencyTypeType .....	37
2.2.2.4.4	fileNameStringType .....	38
2.2.2.4.5	fourPartVersionType .....	38
2.2.2.4.6	publicKeyTokenType .....	38
2.2.3	Target namespace: urn:schemas-microsoft-com:asm.v3 .....	39
2.2.3.1	Global Elements.....	39
2.2.3.1.1	asmv3.....	39
2.2.3.2	Global Attributes.....	39
2.2.3.3	Complex Types .....	39
2.2.3.3.1	requestedPrivilegesType .....	39
2.2.3.3.2	requestedExecutionLevelType .....	40
2.2.3.3.3	asmv3Type.....	40
2.2.3.4	Simple Types.....	40
2.2.4	Target namespace: urn:schemas-microsoft-com:clickonce.v1 .....	40

2.2.4.1	Global Elements.....	40
2.2.4.1.1	customHostSpecified.....	40
2.2.4.2	Global Attributes.....	41
2.2.4.3	Complex Types.....	41
2.2.4.3.1	customHostSpecifiedType.....	41
2.2.4.4	Simple Types.....	41
2.2.5	Target namespace: urn:schemas-microsoft-com:vsta.v3.....	41
2.2.5.1	Global Elements.....	41
2.2.5.1.1	addIn.....	41
2.2.5.2	Global Attributes.....	41
2.2.5.3	Complex Types.....	41
2.2.5.3.1	addInType.....	41
2.2.5.3.2	entryPointsCollectionType.....	42
2.2.5.3.3	entryPointsType.....	42
2.2.5.3.4	entryPointType.....	43
2.2.5.3.5	postActionEntryPointType.....	43
2.2.5.3.6	updateType.....	44
2.2.5.3.7	postActionTypes.....	44
2.2.5.3.8	postActionType.....	45
2.2.5.3.9	postActionDataType.....	45
2.2.5.3.10	applicationType.....	45
2.2.5.4	Simple Types.....	46
2.2.6	Target namespace: urn:schemas-microsoft-com:vsto.v4.....	46
2.2.6.1	Global Elements.....	46
2.2.6.1.1	customizations.....	46
2.2.6.2	Global Attributes.....	46
2.2.6.3	Complex Types.....	46
2.2.6.3.1	customizationsType.....	46
2.2.6.3.2	customizationType.....	47
2.2.6.3.3	appAddInType.....	47
2.2.6.4	Simple Types.....	48
2.2.6.4.1	loadBehaviorType.....	48
2.2.6.4.2	keyStringType.....	48
2.3	Strong Name Signature.....	49
2.3.1	Target namespace: http://www.w3.org/2000/09/xmldsig#.....	49
2.3.1.1	Global Elements.....	49
2.3.1.1.1	Signature.....	49
2.3.1.1.2	SignatureValue.....	49
2.3.1.1.3	SignedInfo.....	50
2.3.1.1.4	CanonicalizationMethod.....	50
2.3.1.1.5	SignatureMethod.....	50
2.3.1.1.6	Reference.....	50
2.3.1.1.7	Transforms.....	51
2.3.1.1.8	Transform.....	51
2.3.1.1.9	DigestMethod.....	51
2.3.1.1.10	DigestValue.....	51
2.3.1.1.11	KeyInfo.....	52
2.3.1.1.12	KeyValue.....	52
2.3.1.1.13	RSAKeyValue.....	52
2.3.1.2	Global Attributes.....	52
2.3.1.3	Complex Types.....	53
2.3.1.3.1	SignatureType.....	53
2.3.1.3.2	SignatureValueType.....	53
2.3.1.3.3	SignedInfoType.....	53
2.3.1.3.4	CanonicalizationMethodType.....	54
2.3.1.3.5	SignatureMethodType.....	54
2.3.1.3.6	ReferenceType.....	55
2.3.1.3.7	TransformsType.....	55

2.3.1.3.8	TransformType.....	56
2.3.1.3.9	DigestMethodType.....	56
2.3.1.3.10	KeyInfoType.....	57
2.3.1.3.11	KeyValueType.....	57
2.3.1.3.12	RSACKeyValueType.....	58
2.3.1.4	Simple Types.....	58
2.3.1.4.1	CryptoBinary.....	58
2.3.1.4.2	DigestValueType.....	58
2.3.2	Target namespace: http://schemas.microsoft.com/windows/rel/2005/reldata ....	59
2.3.2.1	Global Elements.....	59
2.3.2.1.1	RelData.....	59
2.3.2.2	Global Attributes.....	59
2.3.2.3	Complex Types.....	59
2.3.2.3.1	RelDataType.....	59
2.3.2.4	Simple Types.....	59
2.4	Software Publisher Signature.....	60
2.4.1	Target namespace: urn:mpeg:mpeg21:2003:01-REL-R-NS.....	60
2.4.1.1	Global Elements.....	60
2.4.1.1.1	license.....	60
2.4.1.2	Global Attributes.....	60
2.4.1.3	Complex Types.....	60
2.4.1.3.1	License.....	60
2.4.1.3.2	Grant.....	60
2.4.1.3.3	Issuer.....	61
2.4.1.3.4	Right.....	61
2.4.1.4	Simple Types.....	62
2.4.2	Target namespace: http://schemas.microsoft.com/windows/pki/2005/Authenticode 62	62
2.4.2.1	Global Elements.....	62
2.4.2.1.1	ManifestInformation.....	62
2.4.2.1.2	SignedBy.....	62
2.4.2.1.3	AuthenticodePublisher.....	62
2.4.2.1.4	Timestamp.....	62
2.4.2.2	Global Attributes.....	63
2.4.2.3	Complex Types.....	63
2.4.2.3.1	ManifestInformationType.....	63
2.4.2.3.2	SignedByType.....	63
2.4.2.3.3	AuthenticodePublisherType.....	64
2.4.2.4	Simple Types.....	64
2.4.3	Target namespace: http://www.w3.org/2000/09/xmldsig#.....	64
2.4.3.1	Global Elements.....	64
2.4.3.1.1	Signature.....	64
2.4.3.1.2	SignatureValue.....	64
2.4.3.1.3	SignedInfo.....	65
2.4.3.1.4	CanonicalizationMethod.....	65
2.4.3.1.5	SignatureMethod.....	65
2.4.3.1.6	Reference.....	65
2.4.3.1.7	Transforms.....	66
2.4.3.1.8	Transform.....	66
2.4.3.1.9	DigestMethod.....	66
2.4.3.1.10	DigestValue.....	66
2.4.3.1.11	Object.....	67
2.4.3.1.12	KeyInfo.....	67
2.4.3.1.13	KeyValue.....	67
2.4.3.1.14	X509Data.....	67
2.4.3.1.15	RSACKeyValue.....	68
2.4.3.2	Global Attributes.....	68
2.4.3.3	Complex Types.....	68

2.4.3.3.1	SignatureType .....	68
2.4.3.3.2	SignatureValueType.....	69
2.4.3.3.3	SignedInfoType.....	69
2.4.3.3.4	CanonicalizationMethodType .....	70
2.4.3.3.5	SignatureMethodType .....	70
2.4.3.3.6	ReferenceType .....	70
2.4.3.3.7	TransformsType .....	71
2.4.3.3.8	TransformType.....	71
2.4.3.3.9	DigestMethodType .....	72
2.4.3.3.10	ObjectType .....	72
2.4.3.3.11	KeyInfoType .....	73
2.4.3.3.12	KeyValueTypes .....	74
2.4.3.3.13	X509DataType .....	74
2.4.3.3.14	RSAPublicKeyType .....	75
2.4.3.4	Simple Types.....	75
2.4.3.4.1	CryptoBinary.....	75
2.4.3.4.2	DigestValueType .....	75
2.5	Algorithms .....	76
2.5.1	HashTransforms.Identity .....	76
2.5.2	Verification of Strong Name Signature.....	76
2.5.2.1	Conversion from RSA Public Key to publicKeyToken.....	76
2.5.2.2	CryptoAPI PUBLICKEYBLOB Format .....	77
2.5.2.3	PublicKeyBlob Format.....	77
2.5.3	Software Publisher Identity Verification .....	78
2.5.3.1	REL License Verification .....	78
2.5.3.2	Software Publisher Certificate Processing .....	79
2.5.3.3	Timestamp Processing .....	79
2.5.3.4	Converting an X.500 Distinguish Name to a String .....	79
<b>3</b>	<b>Structure Examples .....</b>	<b>82</b>
3.1	Deployment Manifest .....	82
3.2	Application Manifest .....	84
<b>4</b>	<b>Security.....</b>	<b>88</b>
4.1	Security Considerations for Implementers .....	88
4.1.1	Digital Signatures .....	88
4.2	Index of Security Fields .....	88
<b>5</b>	<b>Appendix A: Full XML Schema.....</b>	<b>89</b>
5.1	Deployment Manifest XML Schema .....	89
5.2	Application Manifest XML Schema.....	92
5.3	http://schemas.microsoft.com/windows/pki/2005/Authenticode Schema .....	99
<b>6</b>	<b>Appendix B: Product Behavior .....</b>	<b>100</b>
<b>7</b>	<b>Change Tracking.....</b>	<b>101</b>
<b>8</b>	<b>Index.....</b>	<b>102</b>



# 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 [\[XML1.0\]](#).

**XML schema definition (XSD):** The World Wide Web Consortium (W3C) standard language that is used in defining XML schemas. Schemas are useful for enforcing structure and constraining the types of data that can be used validly within other XML documents. XML schema definition refers to the fully specified and currently recommended standard for use in authoring XML schemas.

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

## 1.2 References

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

### 1.2.1 Normative References

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

[Excl-C14N] Boyer, J., Eastlake 3rd, D. E., and Reagle, J., "Exclusive XML Canonicalization Version 1.0", July 2002, <http://www.w3.org/TR/xml-exc-c14n/>

[FIPS180-4] FIPS PUBS, "Secure Hash Standards (SHS)", March 2012, <http://csrc.nist.gov/publications/fips/fips180-4/fips-180-4.pdf>

[ISO/IEC-21000-5] International Organization for Standardization, "Information technology -- Multimedia framework (MPEG-21) -- Part 5: Rights Expression Language", 2004, [http://www.iso.org/iso/catalogue\\_detail.htm?csnumber=36095](http://www.iso.org/iso/catalogue_detail.htm?csnumber=36095)

[ITUX680] ITU-T, "Abstract Syntax Notation One (ASN.1): Specification of Basic Notation", Recommendation X.680, July 2002, <http://www.itu.int/ITU-T/studygroups/com17/languages/X.680-0207.pdf>

[PKCS9] RSA Laboratories, "PKCS #9: Selected Attribute Types", PKCS #9, version 1.1, November 1993, <http://www.emc.com/emc-plus/rsa-labs/standards-initiatives/pkcs-9-selected-attribute-types.htm>

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

[RFC1779] Kille, S., "A String Representation of Distinguished Names", RFC 1779, March 1995, <http://www.rfc-editor.org/rfc/rfc1779.txt>

[RFC2045] Freed, N., and Borenstein, N., "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", RFC 2045, November 1996, <http://www.rfc-editor.org/rfc/rfc2045.txt>

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

[RFC2315] Kaliski, B., "PKCS #7: Cryptographic Message Syntax Version 1.5", RFC 2315, March 1998, <http://www.ietf.org/rfc/rfc2315.txt>

[RFC3279] Polk, W., Housley, R., and Bassham, L., "Algorithms and Identifiers for the Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile", RFC 3279, April 2002, <http://www.ietf.org/rfc/rfc3279.txt>

[RFC3280] Housley, R., Polk, W., Ford, W., and Solo, D., "Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile", RFC 3280, April 2002, <http://www.ietf.org/rfc/rfc3280.txt>

[RFC3447] Jonsson, J. and Kaliski, B., "Public-Key Cryptography Standards (PKCS) #1: RSA Cryptography Specifications Version 2.1", RFC 3447, February 2003, <http://www.ietf.org/rfc/rfc3447.txt>

[W3C-XSD] World Wide Web Consortium, "XML Schema Part 2: Datatypes Second Edition", 28 October 2004, <http://www.w3.org/TR/2004/REC-xmlschema-2-20041028>

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

[XMLSCHEMA1/2] Thompson, H., Beech, D., Maloney, M., and Mendelsohn, N., Eds., "XML Schema Part 1: Structures Second Edition", W3C Recommendation, October 2004, <http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/>

### 1.2.2 Informative References

[MS-BCSDPFFS] Microsoft Corporation, "[Business Connectivity Services Deployment Package File Format](#)".

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

## 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"/>
```

###### 2.1.1.1.2 Global Attributes

None.

###### 2.1.1.1.3 Complex Types

###### 2.1.1.1.3.1 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-\uFFFF]|[\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 <b>deployment package</b> .

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/xmlsig#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/xmlsig#

*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/xmlsig#

*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/xmlsig#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/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.

**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/xmldsig#>

*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/xmlsig#>

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/xmlsig#>

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/xmlsig#>

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/xmlsig#>

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/xmldsig#>

*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/xmldsig#>

*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>3WAAL94VOQBWMFmGR5520LjqvUtfZZ5x8mXBylxIj5SNwWiLZCFcDEn3jWFC/QyII0jbsRh7t6/UjojcVkJ
          9q0IOMZH7LiREiCQybtQZhtlRt8cgP3Vbob9ChKuKbA8QrvisaFmjniOLyT3T46Wd3ywF3prqGXQmcXuRcaRIjc=</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>3WAAL94VOQBWMFmGR5520LjqvUtfZZ5x8mXBylxIj5SNwWiLZCFcDEn3jWFC/QyII0jbsRh7t6/UjojcVkJ
                      9q0IOMZH7LiREiCQybtQZhtlRt8cgP3Vbob9ChKuKbA8QrvisaFmjniOLyT3T46Wd3ywF3prqGXQmcXuRcaRIjc=</Mod
                      ulus>
                        <Exponent>AQAB</Exponent>
                      </RSAKeyValue>
                    </KeyValue>
                  </KeyInfo>
                </r:issuer>
              </as:AuthenticodePublisher>
            </r:grant>
          </as:AuthenticodePublisher>
        </msrel:RelData>
      </r:license>
    </KeyInfo>
  </SignatureValue>
</SignedInfo>

```

```

        </KeyValue>
        <X509Data>

<X509Certificate>MIIB6jCCAvegAwIBAgIQ/K/TJGThnqRP5Ptyhbwt1jAJBgUrDgMCHQUAMCsxKTANBgNVBAMEIABS
AEUARABNAE8ATgBEAFwAYgBpAGEAcABWAGwAYQBIMB4XDTA5MDUyNjE3MTkyOFoXDTM5MDEwMjAwMDAwMFowKzEpMCCGA
1UEAx4gAFIARQBEAE0ATwBOAEQAXABiAGkAYQBWAAAAhABhAGIwgZ8wDQYJKoZIhvcNAQEBBQADgY0AMIGJAoGBAN1gAC
/eFTjkAVjBZhkeedji46r1LX2WecfJlwtcSI+UjcmIi2QhXaxJ941hQv0MiCNI27EYe7ev1I6I3FZCfatCDjGR+y4kRI
gkMrW0GYbZUbfHID91W6G/QoSrimwPEK74rGhZo54ji8k90+Olnd8sBd6a6h10JnF7kXGkSI3AgMBAAGjFzAVMBMGA1Ud
JQQMMAoGCCsGAQUFBwMDMAkGBSsOAwIdBQADgYEAlAHOz8X1R8tq25KzulhX3VclbhtoeoPBPm0WT/eCTRqqUY6xUO+9T
7e/thWC/cXKPgmBa34fT8BOzX61vPsk8xhLtEqJ8uvgn/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>

```

```

<SignatureValue>R5zs62eeKbJyHooS5YDvKbiBzixFFMvQ5VynRND2MguZe3phsuCwHvRwZVs+eDq0bU1SfscsI69c0
+R/olM6wfmpvrodNVA6xSI33Udl7GDJemKS7o/0nQaiOjXnD8tB9/hIoeZP5D5Zic6LbX8bzXtickKV2HmQiKmaZqXgY
8=</SignatureValue>
  <KeyInfo Id="StrongNameKeyInfo">
    <KeyValue>
      <RSAKeyValue>

<Modulus>3WAAL94VOOQBWMFmGR5520LjqvUfZz5x8mXBy1xIj5SNwwiLZCFcDEn3jWFC/QyII0jbsRh7t6/UjojvKJ
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="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: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/o5lph8FgvlqVwQtPTABpt8
U=</SignatureValue>
  <KeyInfo>
    <KeyValue>
      <RSAKeyValue>

<Modulus>3WAAL94VOOQBWMFmGR5520LjqvUfZz5x8mXBy1xIj5SNwwiLZCFcDEn3jWFC/QyII0jbsRh7t6/UjojvKJ
9q0IOMZH7LiREiCQytbQZhtlRt8cgp3Vbob9ChKuKbA8QrvisaFmjniOLyT3T46Wd3ywF3prqGXQmcXuRcaRIjc=</Mod
ulus>
  <Exponent>AQAB</Exponent>
</RSAKeyValue>
</KeyValue>
<X509Data>

<X509Certificate>MIIB6jCCAvegAwIBAgIQ/K/TJGThnqRP5PtyhbWtljAJBgUrDgMCHQUAMCsxKTAnBgNVBAMEIABS
AEUARABNAE8ATgBEAFwAYgBpPAGEAcABwAGwAYQBIMB4XDTA5MDUyNjE3MTkyOFoXDTM5MDEwMjAwMDAwMDFwKzEpMCCGA
1UEAx4gAFIARQBEEA0ATwBOAEQAXABiAGkAYQBWAAAAAbABhAGIwZ8wDQYJKoZIhvcNAQEBBQADgY0AMIGJAoGBANlgAC
/eFTjkAVjBZhkeedji46r1LX2WecfJlwctcSI+UjcMIi2QhXAxJ941hQv0MiCNI27EYe7ev1I6I3FZCfatCDjGR+y4kRI
gkMrW0GYbZUbfHID9lW6G/QuSrimwPEK74rGhZo54jji8k90+0lnd8sBd6a6hl0JnF7kXGkSI3AgMBAAGjFzAVMBMGA1Ud
JQQMAoGCCsGAQUFBwMDMAkGBSsOAwIdBQADgYEALAHoz8X1R8tq25KzulhX3VclbhtoeoPBPm0WT/eCTRqqUY6xUO+9T
7e/tHWC/cXKpGmBa34fT8BOzX6lvPsk8xhLtEqJ8uvgn/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 <b>hash</b> of the <b>application manifest</b>	<a href="#">2.1.2.3.4</a>
The application manifest contains a hash for all the package files	<a href="#">2.2.2.3.4</a>
Both manifests contain a publisherIdentityType	<a href="#">2.1.2.3.6</a> , <a href="#">2.2.2.3.9</a>
Signature element in assemblyType	<a href="#">2.1.1.3.3</a> , <a href="#">2.2.1.3.2</a>
Strong Name Signature	<a href="#">2.3</a>
Software Publisher Signature	<a href="#">2.4</a>
Algorithms	<a href="#">2.5</a>



## 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]|\[\u1000-\u10FFF])*" />
    </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-
\uFFFF)|[\u1000-\u10FFF]*" />
        </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: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
- Microsoft Office 2021
- Microsoft SharePoint Server Subscription Edition

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

No table of changes is available. The document is either new or has had no changes since its last release.

## 8 Index

### A

#### [Algorithms](#) 76

[conversion from RS public key to publicKeyToken](#)  
76

[converting an X.500 distinguish name to a string](#)  
79

[CryptoAPI UBLICKEYBLOB format](#) 77

[HashTransforms.Identity](#) 76

[PublicKeyBlob format](#) 77

[REL license verification](#) 78

[software publisher certificate processing](#) 79

[software publisher identity verification](#) 78

[timestamp processing](#) 79

[verification of strong name signature](#) 76

#### [Applicability](#) 12

#### [Application manifest](#) 24

Application manifest – schema asm.v1

[global attributes](#) 25

#### [Application Manifest example](#) 84

#### [Application manifest xml schemas](#) 92

Attributes – schema asm.v2

[product](#) 17

[publisher](#) 17

Authenticode schema

[AuthenticodePublisher element](#) 62

[AuthenticodePublisherType complex type](#) 64

[global attributes](#) 63

[ManifestInformation element](#) 62

[ManifestInformationType complex type](#) 63

[SignedBy element](#) 62

[SignedByType complex type](#) 63

[simple type](#) 64

[Timestamp element](#) 62

### C

#### [Change tracking](#) 101

#### [Common data types and fields](#) 13

Complex type – schema reldata

[RelDataType](#) 59

Complex types

xmldsig#

[CanonicalizationMethodType](#) 70

[DigestMethodType](#) 72

[KeyInfoType](#) 73

[KeyValueTypes](#) 74

[ObjectType](#) 72

[ReferenceType](#) 70

[RSAKeyValueTypes](#) 75

[SignatureMethodType](#) 70

[SignatureType](#) ([section 2.4.3.3.1](#) 68, [section 2.4.3.3.2](#) 69)

[SignedInfoType](#) 69

[TransformsType](#) 71

[TransformType](#) 71

[X509DataType](#) 74

Complex types – Authenticode schema

[AuthenticodePublisherType](#) 64

[ManifestInformationType](#) 63

[SignedByType](#) 63

Complex types – schema asm.v1

[assemblyIdentityType](#) ([section 2.1.1.3.1](#) 13, [section 2.2.1.3.1](#) 25)

[assemblyType](#) ([section 2.1.1.3.3](#) 14, [section 2.2.1.3.2](#) 26)

[descriptionType](#) 14

Complex types – schema asm.v2

[applicationRequestMinimumType](#) 35

[applicationType](#) 29

[assemblyIdentityType](#) ([section 2.1.2.3.5](#) 20, [section 2.2.2.3.8](#) 33)

[defaultAssemblyRequestType](#) 36

[dependencyType](#) ([section 2.1.2.3.2](#) 18, [section 2.2.2.3.2](#) 30)

[dependentAssemblyType](#) ([section 2.1.2.3.3](#) 18, [section 2.2.2.3.3](#) 30)

[dependentOSType](#) 31

[deploymentType](#) 18

[entryPointType](#) 34

[fileType](#) 36

[hashType](#) ([section 2.1.2.3.4](#) 19, [section 2.2.2.3.4](#) 31)

[osType](#) 32

[osVersionInfoType](#) 32

[PermissionSetType](#) 35

[publisherIdentityType](#) ([section 2.1.2.3.6](#) 20, [section 2.2.2.3.9](#) 33)

[securityType](#) 34

[trustInfoType](#) 34

#### [Complex types - schema clickonce.v1](#) 81

Complex types - schema vsta.v3

[addInType](#) 41

[applicationType](#) 45

[entryPointsCollectionType](#) 42

[entryPointsType](#) 42

[entryPointType](#) 43

[postActionDataType](#) 45

[postActionEntryPointType](#) 43

[postActionTypes](#) 44

[postActionType](#) 45

[updateType](#) 44

Complex types - schema vsto.v4

[appAddInType](#) 47

[customizationsType](#) 46

[customizationType](#) 47

Complex types - schema xmldsig#

[CanonicalizationMethodType](#) 54

[DigestMethodType](#) 56

[KeyInfoType](#) 57

[KeyValueTypes](#) 57

[ReferenceType](#) 55

[RSAKeyValueTypes](#) 58

[SignatureMethodType](#) 54

[SignatureType](#) 53

[SignatureValueType](#) 53

[SignedInfoType](#) 53

[TransformsType](#) 55

[TransformType](#) 56

Complex types – URN 01-REL-R-NS

[Grant](#) 60

[Issuer](#) 61

[License](#) 60

[Right](#) 61

[Conversion from RSA public key to publicKeyToken algorithm](#) 76  
[Converting an X.500 distinguish name to a string algorithm](#) 79  
[CryptoAPI PUBLICKEYBLOB format algorithm](#) 77

## D

[Data types and fields - common](#) 13  
[Deployment manifest](#) 13  
[Deployment Manifest example](#) 82  
[Deployment manifest XML schemas](#) 89  
Details  
[algorithms](#) 76  
[application manifest](#) 24  
[common data types and fields](#) 13  
[conversion from RSA public key to publicKeyToken algorithm](#) 76  
[converting an X.500 distinguish name to a string algorithm](#) 79  
[CryptoAPI PUBLICKEYBLOB format algorithm](#) 77  
[deployment manifest](#) 13  
[HashTransforms.Identity algorithm](#) 76  
[PublicKeyBlob format algorithm](#) 77  
[REL license verification algorithm](#) 78  
[software publisher certificate processing algorithm](#) 79  
[software publisher identity verification algorithm](#) 78  
[strong name signature](#) 49  
[timestamp processing algorithm](#) 79  
[verification of strong name signature algorithm](#) 76  
Details – Authenticode schema  
[AuthenticodePublisher element](#) 62  
[AuthenticodePublisherType complex type](#) 64  
[ManifestInformation element](#) 62  
[ManifestInformationType complex type](#) 63  
[SignedBy element](#) 62  
[SignedByType complex type](#) 63  
[Timestamp element](#) 62  
Details – schema asm.v1  
assembly element ([section 2.1.1.1.1](#) 13, [section 2.2.1.1.1](#) 25)  
assemblyIdentityType complex type ([section 2.1.1.3.1](#) 13, [section 2.2.1.3.1](#) 25)  
[assemblyType complex type](#) 14  
[descriptType complex type](#) 14  
fileNameStringType simple type ([section 2.1.1.4.4](#) 16, [section 2.2.1.4.4](#) 28)  
fourPartVersionType simple type ([section 2.1.1.4.3](#) 16, [section 2.2.1.4.3](#) 27)  
publicKeyTokenType simple type ([section 2.1.1.4.2](#) 15, [section 2.2.1.4.2](#) 27)  
twoPartVersionType simple type ([section 2.1.1.4.1](#) 15, [section 2.2.1.4.1](#) 27)  
Details – schema asm.v2  
[application element](#) 28  
[applicationRequestMinimumType complex type](#) 35  
[applicationType complex type](#) 29  
[assemblyIdentity element](#) 29  
assemblyIdentityType complex type ([section 2.1.2.3.5](#) 20, [section 2.2.2.3.8](#) 33)  
[defaultAssemblyRequestType complex type](#) 36  
dependency element ([section 2.1.2.1.2](#) 17, [section 2.2.2.1.4](#) 29)

dependencyType complex type ([section 2.1.2.3.2](#) 18, [section 2.2.2.3.2](#) 30)  
[dependencyType simple type](#) 37  
dependentAssemblyType complex type ([section 2.1.2.3.3](#) 18, [section 2.2.2.3.3](#) 30)  
[dependentOSType complex type](#) 31  
[deployment element](#) 17  
[deploymentType complex type](#) 18  
[entryPoint element](#) 28  
[entryPointType complex type](#) 34  
[file element](#) 29  
fileNameStringType simple type ([section 2.1.2.4.2](#) 21, [section 2.2.2.4.4](#) 38)  
[fileType complex type](#) 36  
fourPartVersionType simple type ([section 2.1.2.4.1](#) 21, [section 2.2.2.4.5](#) 38)  
hashType complex type ([section 2.1.2.3.4](#) 19, [section 2.2.2.3.4](#) 31)  
[OneByteVersion simple type](#) 37  
[osType complex type](#) 32  
[osVersionInfoType complex type](#) 32  
[PermissionSetType complex type](#) 35  
[product attribute](#) 17  
[publicKeyTokenType simple type](#) 38  
[publicKeyTokenType simple type](#) 21  
[publisher attribute](#) 17  
publisherIdentity element ([section 2.1.2.1.3](#) 17, [section 2.2.2.1.7](#) 29)  
publisherIdentityType complex type ([section 2.1.2.3.6](#) 20, [section 2.2.2.3.9](#) 33)  
[securityType complex type](#) 34  
[trustInfo element](#) 28  
[trustInfoType complex type](#) 34  
[TwoByteVersion simple type](#) 37  
Details – schema asm.v3  
[asmv3 element](#) 39  
[asmv3Type complex type](#) 40  
[requestedExecutionLevelType complex type](#) 40  
[requestedPrivilegesType complex type](#) 39  
Details - schema clickonce.v1  
[customHostSpecified Type complex type](#) 41  
Details – schema clickonce.v1  
[customHostSpecified element](#) 40  
Details - schema reldata  
[RelData element](#) 59  
[RelDataType complex type](#) 59  
Details - schema vsta.v3  
[addIn element](#) 41  
[addInType complex type](#) 41  
[applicationType complex type](#) 45  
[entryPointsCollectionType complex type](#) 42  
[entryPointsType complex type](#) 42  
[entryPointType complex type](#) 43  
[postActionDataType complex type](#) 45  
[postActionEntryPointType complex type](#) 43  
[postActionsType complex type](#) 44  
[postActionType complex type](#) 45  
[simple types](#) 46  
[updateType complex type](#) 44  
Details - schema vsto.v4  
[appAddInType complex type](#) 47  
[customizations element](#) 46  
[customizationsType complex type](#) 46  
[customizationType complex type](#) 47  
[keyStringType simple type](#) 48

[loadBehaviorType simple type](#) 48

Details - schema xmldsig#

- [CanonicalizationMethod element](#) 50
- [CanonicalizationMethodType complex type](#) 54
- [CryptoBinary simple type](#) 58
- [DigestMethod element](#) 51
- [DigestMethodType complex type](#) 56
- [DigestValue element](#) 51
- [DigestValueType simple type](#) 58
- [KeyInfo element](#) 52
- [KeyInfoType complex type](#) 57
- [KeyValue element](#) 52
- [KeyValueComplexType complex type](#) 57
- [Reference element](#) 50
- [ReferenceType complex type](#) 55
- [RSAKeyValue element](#) 52
- [RSAKeyValueComplexType complex type](#) 58
- [Signature element](#) 49
- [SignatureMethod element](#) 50
- [SignatureMethodType complex type](#) 54
- [SignatureType complex type](#) 53
- [SignatureValue element](#) 49
- [SignatureValueComplexType complex type](#) 53
- [SignedInfo element](#) 50
- [SignedInfoType complex type](#) 53
- [Transform element](#) 51
- [Transforms element](#) 51
- [TransformsComplexType complex type](#) 55
- [TransformType complex type](#) 56

Details - URN 01-REL-R-NS

- [Grant complex type](#) 60
- [Issuer complex type](#) 61
- [License complex type](#) 60
- [license element](#) 60
- [Right complex type](#) 61

Details - xmldsig#

- [CanonicalizationMethod element](#) 65
- [CanonicalizationMethodType complex type](#) 70
- [CryptoBinary simple type](#) 75
- [DigestMethod element](#) 66
- [DigestMethodType complex type](#) 72
- [DigestValue element](#) 66
- [DigestValueType simple type](#) 75
- [KeyInfo element](#) 67
- [KeyInfoType complex type](#) 73
- [KeyValue element](#) 67
- [KeyValueComplexType complex type](#) 74
- [Object element](#) 67
- [ObjectType complex type](#) 72
- [Reference element](#) 65
- [ReferenceType complex type](#) 70
- [RSAKeyValue element](#) 68
- [RSAKeyValueComplexType complex type](#) 75
- [Signature element](#) 64
- [SignatureMethod element](#) 65
- [SignatureMethodType complex type](#) 70
- [SignatureType complex type](#) ([section 2.4.3.3.1](#) 68, [section 2.4.3.3.2](#) 69)
- [SignatureValue element](#) 64
- [SignedInfo element](#) 65
- [SignedInfoType complex type](#) 69
- [Transform element](#) 66
- [Transforms element](#) 66
- [TransformsComplexType complex type](#) 71
- [TransformType complex type](#) 71

- [X509Data element](#) 67
- [X509DataType complex type](#) 74

Details schema asm.v1

- [assemblyType complex type](#) 26

## E

Elements - Authenticode schema

- [AuthenticodePublisher](#) 62
- [ManifestInformation](#) 62
- [SignedBy](#) 62
- [Timestamp](#) 62

Elements - schema asm.v1

- [assembly](#) 25

Elements - schema asm.v2

- [application](#) 28
- [assemblyIdentity](#) 29
- [dependency](#) ([section 2.1.2.1.2](#) 17, [section 2.2.2.1.4](#) 29)
- [deployment](#) 17
- [entryPoint](#) 28
- [file](#) 29
- [publisherIdentity](#) ([section 2.1.2.1.3](#) 17, [section 2.2.2.1.7](#) 29)
- [trustInfo](#) 28

Elements - schema asm.v3

- [asmv3](#) 39

Elements - schema clickonce.v1

- [customHostSpecified](#) 40

Elements - schema reldata

- [RelData](#) 59

Elements - schema vsta.v3

- [addIn](#) 41

Elements - schema vsto.v4

- [customizations](#) 46

Elements - schema xmldsig#

- [CanonicalizationMethod](#) 50
- [DigestMethod](#) 51
- [DigestValue](#) 51
- [KeyInfo](#) 52
- [KeyValue](#) 52
- [Reference](#) 50
- [RSAKeyValue](#) 52
- [Signature](#) 49
- [SignatureMethod](#) 50
- [SignatureValue](#) 49
- [SignedInfo](#) 50
- [Transform](#) 51
- [Transforms](#) 51

Elements - URN 01-REL-R-NS

- [license](#) 60

Elements - xmldsig#

- [CanonicalizationMethod](#) 65
- [DigestMethod](#) 66
- [DigestValue](#) 66
- [KeyInfo](#) 67
- [KeyValue](#) 67
- [Object](#) 67
- [Reference](#) 65
- [RSAKeyValue](#) 68
- [Signature](#) 64
- [SignatureMethod](#) 65
- [SignatureValue](#) 64
- [SignedInfo](#) 65
- [Transform](#) 66



[Transforms](#) 66  
[X509Data](#) 67  
[Examples](#) 82  
[Application Manifest](#) 84  
[Deployment Manifest](#) 82

## F

[Fields - security index](#) 88  
[Fields - vendor-extensible](#) 12

## G

Global attributes  
[Authenticode schema](#) 63  
[schema asm.v1](#) 13  
[schema asm.v2](#) 29  
[schema asm.v3](#) 39  
[schema clickonce.v1](#) 41  
[schema reldata](#) 59  
[schema vsta.v3](#) 41  
[schema vsto.v4](#) 46  
[schema xmldsig#](#) 52  
[URN 01-REL-R-NS](#) 60  
[xmldsig#](#) 68  
Global attributes – schema asm.v1  
[application manifest](#) 25  
[Glossary](#) 9

## H

[HashTransforms.Identity algorithm](#) 76  
http  
  
[//schemas.microsoft.com/windows/pki/2005/Authenticode](#) 99

## I

[Implementer - security considerations](#) 88  
[Index of security fields](#) 88  
[Informative references](#) 11  
[Introduction](#) 9

## L

[Localization](#) 12

## N

[Normative references](#) 10

## O

[Overview \(synopsis\)](#) 11

## P

[Product behavior](#) 100  
[PublicKeyBlob format algorithm](#) 77

## R

[References](#) 10

[informative](#) 11  
[normative](#) 10  
[REL license verification algorithm](#) 78  
[Relationship to protocols and other structures](#) 12

## S

Schema asm.v1  
assembly element ([section 2.1.1.1.1](#) 13, [section 2.2.1.1.1](#) 25)  
assemblyIdentityType complex type ([section 2.1.1.3.1](#) 13, [section 2.2.1.3.1](#) 25)  
assemblyType complex type ([section 2.1.1.3.3](#) 14, [section 2.2.1.3.2](#) 26)  
descriptionType complex type 14  
fileNameString simple type 16  
fileNameStringType simple type 28  
fourPartVersionType simple type ([section 2.1.1.4.3](#) 16, [section 2.2.1.4.3](#) 27)  
global attributes 13  
publicKeyTokenType simple type ([section 2.1.1.4.2](#) 15, [section 2.2.1.4.2](#) 27)  
twoPartVersionType simple type ([section 2.1.1.4.1](#) 15, [section 2.2.1.4.1](#) 27)  
Schema asm.v2  
[application element](#) 28  
[applicationRequestMinimumType complex type](#) 35  
[applicationType complex type](#) 29  
[assemblyIdentity element](#) 29  
assemblyIdentityType complex type ([section 2.1.2.3.5](#) 20, [section 2.2.2.3.8](#) 33)  
[defaultAssemblyRequestType complex type](#) 36  
[dependency complex type](#) 18  
dependency element ([section 2.1.2.1.2](#) 17, [section 2.2.2.1.4](#) 29)  
[dependencyType complex type](#) 30  
[dependencyTypeType simple type](#) 37  
dependentAssemblyType complex type ([section 2.1.2.3.3](#) 18, [section 2.2.2.3.3](#) 30)  
[dependentOSType complex type](#) 31  
[deployment complex type](#) 18  
[deployment element](#) 17  
[entryPoint element](#) 28  
[entryPointType complex type](#) 34  
[file element](#) 29  
fileNameStringType simple type ([section 2.1.2.4.2](#) 21, [section 2.2.2.4.4](#) 38)  
[fileType complex type](#) 36  
fourPartVersionType simple type ([section 2.1.2.4.1](#) 21, [section 2.2.2.4.5](#) 38)  
global attributes 29  
hashType complex type ([section 2.1.2.3.4](#) 19, [section 2.2.2.3.4](#) 31)  
[OneByteVersion simple type](#) 37  
[osType complex type](#) 32  
[osVersionInfoType complex type](#) 32  
[PermissionSetType complex type](#) 35  
[product attribute](#) 17  
publicKeyTokenType simple type ([section 2.1.2.4.3](#) 21, [section 2.2.2.4.6](#) 38)  
[publisher attribute](#) 17  
publisherIdentity element ([section 2.1.2.1.3](#) 17, [section 2.2.2.1.7](#) 29)  
publisherIdentityType complex type ([section 2.1.2.3.6](#) 20, [section 2.2.2.3.9](#) 33)

[securityType complex type](#) 34  
[trustInfo element](#) 28  
[trustInfoType complex type](#) 34  
[TwoByteVersion simple type](#) 37  
 Schema asm.v3  
   [asmv3 element](#) 39  
   [asmv3Type complex type](#) 40  
   [global attributes](#) 39  
   [requestedExecutionLevelType complex type](#) 40  
   [requestedPrivilegesType complex type](#) 39  
   [simple types](#) 40  
 Schema clickonce.v1  
   [customHostSpecified element](#) 40  
   [customHostSpecifiedType complex type](#) 41  
   [global attributes](#) 41  
   [simple types](#) 41  
 Schema reldata  
   [global attributes](#) 59  
   [RelData element](#) 59  
   [RelDataType complex type](#) 59  
   [simple types](#) 59  
 Schema vsta.v3  
   [addIn element](#) 41  
   [addInType complex type](#) 41  
   [applicationType complex type](#) 45  
   [entryPointsCollectionType complex type](#) 42  
   [entryPointsType complex type](#) 42  
   [entryPointType complex type](#) 43  
   [global attributes](#) 41  
   [postActionDataType complex type](#) 45  
   [postActionEntryPointType complex type](#) 43  
   [postActionsType complex type](#) 44  
   [postActionType complex type](#) 45  
   [updateType complex type](#) 44  
 Schema vsto.v4  
   [appAddInType complex type](#) 47  
   [customizations element](#) 46  
   [customizationsType complex type](#) 46  
   [customizationType complex type](#) 47  
   [global attributes](#) 46  
   [keyStringType simple type](#) 48  
   [loadBehaviorType simple type](#) 48  
 Schema xmldsig#  
   [CanonicalizationMethod element](#) 50  
   [CanonicalizationMethodType complex type](#) 54  
   [CryptoBinary simple type](#) 58  
   [DigestMethod element](#) 51  
   [DigestMethodType complex type](#) 56  
   [DigestValue element](#) 51  
   [DigestValueType simple type](#) 58  
   [global attributes](#) 52  
   [KeyInfo element](#) 52  
   [KeyInfoType complex type](#) 57  
   [KeyValue element](#) 52  
   [KeyValueComplexType complex type](#) 57  
   [Reference element](#) 50  
   [ReferenceType complex type](#) 55  
   [RSAKeyValue element](#) 52  
   [RSAKeyValueComplexType complex type](#) 58  
   [Signature element](#) 49  
   [SignatureMethod element](#) 50  
   [SignatureMethodType complex type](#) 54  
   [SignatureType complex type](#) 53  
   [SignatureValue element](#) 49  
   [SignatureValueComplexType complex type](#) 53  
   [SignedInfo element](#) 50  
   [SignedInfoType complex type](#) 53  
   [Transform element](#) 51  
   [Transforms element](#) 51  
   [TransformsType complex type](#) 55  
   [TransformType complex type](#) 56  
 Security  
   [Digital Signatures](#) 88  
   [field index](#) 88  
   [implementer considerations](#) 88  
 Simple types  
   [Authenticode schema](#) 64  
   [schema asm.v3](#) 40  
   [schema clickonce.v1](#) 41  
   [schema reldata](#) 59  
   [schema vsta.v3](#) 46  
   [URN 01-REL-R-NS](#) 62  
   xmldsig#  
     [CryptoBinary](#) 75  
     [DigestValueType](#) 75  
 Simple types – schema asm.v1  
   [fileNameString](#) 16  
   [fileNameStringType](#) 28  
   [fourPartVersion](#) 16  
   [fourPartVersionType](#) 27  
   [publicKeyTokenType](#) ([section 2.1.1.4.2](#) 15, [section 2.2.1.4.2](#) 27)  
   [twoPartVersion](#) 15  
   [twoPartVersionType](#) 27  
 Simple types – schema asm.v2  
   [dependencyTypeType](#) 37  
   [fileNameStringType](#) ([section 2.1.2.4.2](#) 21, [section 2.2.2.4.4](#) 38)  
   [fourPartVersionType](#) ([section 2.1.2.4.1](#) 21, [section 2.2.2.4.5](#) 38)  
   [OneByteVersion](#) 37  
   [publicKeyTokenType](#) 21  
   [TwoByteVersion](#) 37  
   [TwoByteVersionType](#) 38  
 Simple types – schema asm.v3  
   [asmv3Type](#) 40  
   [requestedExecutionLevelType](#) 40  
   [requestedPrivilegesType](#) 39  
 Simple types - schema vsto.v4  
   [keyStringType](#) 48  
   [loadBehaviorType](#) 48  
 Simple types - schema xmldsig#  
   [CryptoBinary](#) 58  
   [DigestValueType](#) 58  
   [Software publisher certificate processing algorithm](#) 79  
   [Software publisher identity verification algorithm](#) 78  
   [Strong name signature](#) 49  
 Structures  
   [algorithms](#) 76  
   [application manifest](#) 24  
   [deployment manifest](#) 13  
   [overview](#) 13  
   [strong name signature](#) 49  
 Structures – schema asm.v1  
   [assembly element](#) 13  
 Structures – schema asm.v1  
   [global attributes](#) 13  
**T**

[Timestamp processing algorithm](#) 79  
[Tracking changes](#) 101

## U

URN 01-REL-R-NS  
[global attributes](#) 60  
[Grant complex type](#) 60  
[Issuer complex type](#) 61  
[License complex type](#) 60  
[license element](#) 60  
[Right complex type](#) 61  
[simple types](#) 62

## V

[Vendor-extensible fields](#) 12  
[Verification of strong name signature algorithm](#) 76  
[Versioning](#) 12

## X

XML schema files  
[application manifest xml schemas](#) 92  
[deployment manifest xml schemas](#) 89  
http  
  
[//schemas.microsoft.com/windows/pki/2005/AutHenticode](http://schemas.microsoft.com/windows/pki/2005/AutHenticode) 99  
Xmlldsig#  
[CanonicalizationMethod element](#) 65  
[CanonicalizationMethodType complex type](#) 70  
[CryptoBinary simple type](#) 75  
[DigestMethod element](#) 66  
[DigestMethodType complex type](#) 72  
[DigestValue element](#) 66  
[DigestValueType simple type](#) 75  
[global attributes](#) 68  
[KeyInfo element](#) 67  
[KeyInfoType complex type](#) 73  
[KeyValue element](#) 67  
[KeyValueComplexType complex type](#) 74  
[Object element](#) 67  
[ObjectType complex type](#) 72  
[Reference element](#) 65  
[ReferenceType complex type](#) 70  
[RSAKeyValue element](#) 68  
[RSAKeyValueComplexType complex type](#) 75  
[Signature element](#) 64  
[SignatureMethod element](#) 65  
[SignatureMethodType complex type](#) 70  
SignatureType complex type ([section 2.4.3.3.1](#) 68,  
[section 2.4.3.3.2](#) 69)  
[SignatureValue element](#) 64  
[SignedInfo element](#) 65  
[SignedInfoType complex type](#) 69  
[Transform element](#) 66  
[Transforms element](#) 66  
[TransformsType complex type](#) 71  
[TransformType complex type](#) 71  
[X509Data element](#) 67  
[X509DataType complex type](#) 74