

## [MC-NBFS]:

# .NET Binary Format: SOAP Data Structure

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## Revision Summary

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7/2/2009	0.5.1	Editorial	Changed language and formatting in the technical content.
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8/8/2013	3.0	None	No changes to the meaning, language, or formatting of the technical content.
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# 1 Introduction

This specification defines the .NET Binary Format: SOAP Data Structure, which is a new format built by extending the format described in the .NET Binary Format: **XML** Data Structure, as specified in [\[MC-NBFX\]](#). While the SOAP data structure is structurally identical to the XML data structure, should not be used where an XML data structure document is expected.

The XML Data Structure specifies a binary XML format to efficiently encode the structures that are common to any XML document. The SOAP protocol specifies an XML document with specific structures that are common to many SOAP messages. While using XML Data Structure alone to encode SOAP messages provides efficiencies for the structures of XML, one can observe that strings common to many SOAP messages are still encoded in their entirety. Furthermore, the XML data structure does not specify how a producer and a consumer of a document agree on the strings referenced within a document.

The purpose of the SOAP data structure is to extend the XML data structure format to further reduce the cost of generating SOAP documents by defining a shortened structure of strings to which a producer and a consumer can refer.

Sections 1.7 and 2 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in [\[RFC2119\]](#). All other sections and examples in this specification are informative.

## 1.1 Glossary

The following terms are specific to this document:

**.NET Framework:** An integral Windows component that supports building and running applications and **XML** web services. The Microsoft .NET Framework has two main components: the common language runtime and the .NET Framework class library. For more information about the .NET Framework, see [\[MSDN-.NET-FRAMEWORK\]](#). The following versions of the .NET Framework are available in the following released Windows products or as supplemental software. Microsoft .NET Framework 1.0: Windows NT 4.0 operating system, Microsoft Windows 98 operating system, Windows 2000 operating system, Windows Millennium Edition operating system, Windows XP operating system, and Windows Server 2003 operating system. Microsoft .NET Framework 1.1: Windows 98, Windows 2000, Windows Millennium Edition, Windows XP, Windows Server 2003, Windows Server 2003 R2 operating system, Windows Vista operating system, and Windows Server 2008 operating system. Microsoft .NET Framework 2.0: Windows 98, Windows 2000, Windows Millennium Edition, Windows XP, Windows Server 2003, Windows Server 2003 R2, Windows Vista, Windows Server 2008, Windows 7 operating system, Windows Server 2008 R2 operating system, Windows 8 operating system, Windows Server 2012 operating system, Windows 8.1 operating system, Windows Server 2012 R2 operating system, Windows 10 operating system, and Windows Server 2016 Technical Preview operating system. Microsoft .NET Framework 3.0: Windows XP, Windows Server 2003, Windows Server 2003 R2, Windows Vista, Windows Server 2008, Windows 7, Windows Server 2008 R2, Windows 8, Windows Server 2012, Windows 8.1, Windows Server 2012 R2, Windows 10, and Windows Server 2016 Technical Preview. Microsoft .NET Framework 3.5: Windows XP, Windows Server 2003, Windows Server 2003 R2, Windows Vista, Windows Server 2008, Windows 7, Windows Server 2008 R2, Windows 8, Windows Server 2012, Windows 8.1, Windows Server 2012 R2, Windows 10, and Windows Server 2016 Technical Preview. Microsoft .NET Framework 4.0: Windows XP, Windows Server 2003, Windows Server 2003 R2, Windows Vista, Windows Server 2008, Windows 7, Windows Server 2008 R2, Windows 8, Windows Server 2012, Windows 8.1, Windows Server 2012 R2, Windows 10, and Windows Server 2016 Technical Preview. Microsoft .NET Framework 4.5: Windows Vista, Windows Server 2008, Windows 7, Windows Server 2008 R2, Windows 8, Windows Server 2012, Windows 8.1, Windows Server 2012 R2, and Windows 10. Microsoft .NET Framework 4.6: Windows Vista, Windows Server 2008, Windows 7, Windows

Server 2008 R2, Windows 8, Windows Server 2012, Windows 8.1, Windows Server 2012 R2, and Windows 10.

**MultiByteInt31:** A structure defined in [MC-NBFX] section 2.1.2 that encodes small integer values in fewer bytes than large integer values.

**record:** The fundamental unit of information in the .NET Binary Format: XML Data Structure encoded as a variable length series of bytes. [MC-NBFX] section 2 specifies the format for each type of **record**.

**string:** A structure that represents a set of characters ([MC-NBFX] section 2.1.3).

**XML:** The Extensible Markup Language, as described in [XML1.0].

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

## 1.2 References

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

### 1.2.1 Normative References

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

[MC-NBFSE] Microsoft Corporation, "[.NET Binary Format: SOAP Extension](#)".

[MC-NBFX] Microsoft Corporation, "[.NET Binary Format: XML Data Structure](#)".

[MC-NMF] Microsoft Corporation, "[.NET Message Framing Protocol](#)".

[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>

[SOAP1.2-1/2007] Gudgin, M., Hadley, M., Mendelsohn, N., et al., "SOAP Version 1.2 Part 1: Messaging Framework (Second Edition)", W3C Recommendation 27, April 2007, <http://www.w3.org/TR/2007/REC-soap12-part1-20070427/>

### 1.2.2 Informative References

None.

## 1.3 Overview

The .NET Binary Format: SOAP Data Structure is used to efficiently represent SOAP documents, as specified in [\[SOAP1.2-1/2007\]](#).

## 1.4 Relationship to Protocols and Other Structures

The .NET Binary Format: SOAP Data Structure extends the .NET Binary Format: XML Data Structure, as specified in [\[MC-NBFX\]](#). The .NET Binary Format: SOAP Extension, as specified in [\[MC-NBFSE\]](#), and

the .NET Message Framing Protocol, as specified in [\[MC-NMF\]](#), both use the .NET Binary Format: SOAP Data Structure.

## **1.5 Applicability Statement**

The .NET Binary Format: SOAP Data Structure is a general-purpose way to represent an XML document and is applied as specified in [\[MC-NBFX\]](#) section 1.3. Additionally, the format is particularly well-suited for SOAP documents as specified in [\[SOAP1.2-1/2007\]](#) because it defines a fixed set of s from the SOAP vocabulary that a producer and a consumer of documents in this format may reference and results in smaller documents.

This specification extends the format described by [\[MC-NBFX\]](#), which describes an efficient encoding for general XML documents. This specification describes efficient encoding for strings that are specific to SOAP messages and does not supersede any of the structures defined in [\[MC-NBFX\]](#).

## **1.6 Versioning and Localization**

For information on versioning and localization, see [\[MC-NBFX\]](#) section 1.3.

## **1.7 Vendor-Extensible Fields**

The .NET Binary Format: SOAP Data Structure has no vendor-extensible fields.

## 2 Structures

The structures in the .NET Binary Format: SOAP Data Structure are identical to those specified in [\[MC-NBFX\]](#), except that the DictionaryString structure, as defined in [\[MC-NBFX\]](#) section 1.3, has an additional meaning, described in the following section.

### 2.1 DictionaryString

The DictionaryString structure describes a reference to a set of characters. This specification lists a static set of characters that both producer and consumer can map via the DictionaryString structure.

The DictionaryString structure MUST be an even integer value. This restriction exists such that another specification, namely [\[MC-NBFSE\]](#), may define the odd integers to reference another list of sets of characters.

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
Value (variable)																															

**Value (variable):** An even integer value encoded by using **MultiByteInt31**. The value MUST be one of the values shown in the first column of the following table. The characters represented by this data structure MUST correspond to the characters—exactly as they are shown—in the second column of the following table. Even values not appearing in the following table have no character representation and are reserved.

Value	Characters
0x00	mustUnderstand
0x02	Envelope
0x04	<a href="http://www.w3.org/2003/05/soap-envelope">http://www.w3.org/2003/05/soap-envelope</a>
0x06	<a href="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing</a>
0x08	Header
0x0A	Action
0x0C	To
0x0E	Body
0x10	Algorithm
0x12	RelatesTo
0x14	<a href="http://www.w3.org/2005/08/addressing/anonymous">http://www.w3.org/2005/08/addressing/anonymous</a>
0x16	URI
0x18	Reference
0x1A	MessageID
0x1C	Id
0x1E	Identifier



<b>Value</b>	<b>Characters</b>
0x20	<a href="http://schemas.xmlsoap.org/ws/2005/02/rm">http://schemas.xmlsoap.org/ws/2005/02/rm</a>
0x22	Transforms
0x24	Transform
0x26	DigestMethod
0x28	DigestValue
0x2A	Address
0x2C	ReplyTo
0x2E	SequenceAcknowledgement
0x30	AcknowledgementRange
0x32	Upper
0x34	Lower
0x36	BufferRemaining
0x38	<a href="http://schemas.microsoft.com/ws/2006/05/rm">http://schemas.microsoft.com/ws/2006/05/rm</a>
0x3A	<a href="http://schemas.xmlsoap.org/ws/2005/02/rm/SequenceAcknowledgement">http://schemas.xmlsoap.org/ws/2005/02/rm/SequenceAcknowledgement</a>
0x3C	SecurityTokenReference
0x3E	Sequence
0x40	MessageNumber
0x42	<a href="http://www.w3.org/2000/09/xmlsig#">http://www.w3.org/2000/09/xmlsig#</a>
0x44	<a href="http://www.w3.org/2000/09/xmlsig#enveloped-signature">http://www.w3.org/2000/09/xmlsig#enveloped-signature</a>
0x46	KeyInfo
0x48	<a href="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd">http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd</a>
0x4A	<a href="http://www.w3.org/2001/04/xmlenc#">http://www.w3.org/2001/04/xmlenc#</a>
0x4C	<a href="http://schemas.xmlsoap.org/ws/2005/02/sc">http://schemas.xmlsoap.org/ws/2005/02/sc</a>
0x4E	DerivedKeyToken
0x50	Nonce
0x52	Signature
0x54	SignedInfo
0x56	CanonicalizationMethod
0x58	SignatureMethod
0x5A	SignatureValue
0x5C	DataReference
0x5E	EncryptedData

<b>Value</b>	<b>Characters</b>
0x60	EncryptionMethod
0x62	CipherData
0x64	CipherValue
0x66	<a href="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd">http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd</a>
0x68	Security
0x6A	Timestamp
0x6C	Created
0x6E	Expires
0x70	Length
0x72	ReferenceList
0x74	ValueType
0x76	Type
0x78	EncryptedHeader
0x7A	<a href="http://docs.oasis-open.org/wss/oasis-wss-wssecurity-secext-1.1.xsd">http://docs.oasis-open.org/wss/oasis-wss-wssecurity-secext-1.1.xsd</a>
0x7C	RequestSecurityTokenResponseCollection
0x7E	<a href="http://schemas.xmlsoap.org/ws/2005/02/trust">http://schemas.xmlsoap.org/ws/2005/02/trust</a>
0x80	<a href="http://schemas.xmlsoap.org/ws/2005/02/trust#BinarySecret">http://schemas.xmlsoap.org/ws/2005/02/trust#BinarySecret</a>
0x82	<a href="http://schemas.microsoft.com/ws/2006/02/transactions">http://schemas.microsoft.com/ws/2006/02/transactions</a>
0x84	s
0x86	Fault
0x88	MustUnderstand
0x8A	role
0x8C	relay
0x8E	Code
0x90	Reason
0x92	Text
0x94	Node
0x96	Role
0x98	Detail
0x9A	Value
0x9C	Subcode
0x9E	NotUnderstood

Value	Characters
0xA0	qname
0xA2	
0xA4	From
0xA6	FaultTo
0xA8	EndpointReference
0xAA	PortType
0xAC	ServiceName
0xAE	PortName
0xB0	ReferenceProperties
0xB2	RelationshipType
0xB4	Reply
0xB6	a
0xB8	<a href="http://schemas.xmlsoap.org/ws/2006/02/addressingidentity">http://schemas.xmlsoap.org/ws/2006/02/addressingidentity</a>
0xBA	Identity
0xBC	Spn
0xBE	Upn
0xC0	Rsa
0xC2	Dns
0xC4	X509v3Certificate
0xC6	<a href="http://www.w3.org/2005/08/addressing/fault">http://www.w3.org/2005/08/addressing/fault</a>
0xC8	ReferenceParameters
0xCA	IsReferenceParameter
0xCC	<a href="http://www.w3.org/2005/08/addressing/reply">http://www.w3.org/2005/08/addressing/reply</a>
0xCE	<a href="http://www.w3.org/2005/08/addressing/none">http://www.w3.org/2005/08/addressing/none</a>
0xD0	Metadata
0xD2	<a href="http://schemas.xmlsoap.org/ws/2004/08/addressing">http://schemas.xmlsoap.org/ws/2004/08/addressing</a>
0xD4	<a href="http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous">http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</a>
0xD6	<a href="http://schemas.xmlsoap.org/ws/2004/08/addressing/fault">http://schemas.xmlsoap.org/ws/2004/08/addressing/fault</a>
0xD8	<a href="http://schemas.xmlsoap.org/ws/2004/06/addressingex">http://schemas.xmlsoap.org/ws/2004/06/addressingex</a>
0xDA	RedirectTo
0xDC	Via
0xDE	<a href="http://www.w3.org/2001/10/xml-exc-c14n#">http://www.w3.org/2001/10/xml-exc-c14n#</a>

<b>Value</b>	<b>Characters</b>
0xE0	PrefixList
0xE2	InclusiveNamespaces
0xE4	ec
0xE6	SecurityContextToken
0xE8	Generation
0xEA	Label
0xEC	Offset
0xEE	Properties
0xF0	Cookie
0xF2	wsc
0xF4	<a href="http://schemas.xmlsoap.org/ws/2004/04/sc">http://schemas.xmlsoap.org/ws/2004/04/sc</a>
0xF6	<a href="http://schemas.xmlsoap.org/ws/2004/04/security/sc/dk">http://schemas.xmlsoap.org/ws/2004/04/security/sc/dk</a>
0xF8	<a href="http://schemas.xmlsoap.org/ws/2004/04/security/sc/sct">http://schemas.xmlsoap.org/ws/2004/04/security/sc/sct</a>
0xFA	<a href="http://schemas.xmlsoap.org/ws/2004/04/security/trust/RST/SCT">http://schemas.xmlsoap.org/ws/2004/04/security/trust/RST/SCT</a>
0xFC	<a href="http://schemas.xmlsoap.org/ws/2004/04/security/trust/RSTR/SCT">http://schemas.xmlsoap.org/ws/2004/04/security/trust/RSTR/SCT</a>
0xFE	RenewNeeded
0x100	BadContextToken
0x102	c
0x104	<a href="http://schemas.xmlsoap.org/ws/2005/02/sc/dk">http://schemas.xmlsoap.org/ws/2005/02/sc/dk</a>
0x106	<a href="http://schemas.xmlsoap.org/ws/2005/02/sc/sct">http://schemas.xmlsoap.org/ws/2005/02/sc/sct</a>
0x108	<a href="http://schemas.xmlsoap.org/ws/2005/02/trust/RST/SCT">http://schemas.xmlsoap.org/ws/2005/02/trust/RST/SCT</a>
0x10A	<a href="http://schemas.xmlsoap.org/ws/2005/02/trust/RSTR/SCT">http://schemas.xmlsoap.org/ws/2005/02/trust/RSTR/SCT</a>
0x10C	<a href="http://schemas.xmlsoap.org/ws/2005/02/trust/RST/SCT/Renew">http://schemas.xmlsoap.org/ws/2005/02/trust/RST/SCT/Renew</a>
0x10E	<a href="http://schemas.xmlsoap.org/ws/2005/02/trust/RSTR/SCT/Renew">http://schemas.xmlsoap.org/ws/2005/02/trust/RSTR/SCT/Renew</a>
0x110	<a href="http://schemas.xmlsoap.org/ws/2005/02/trust/RST/SCT/Cancel">http://schemas.xmlsoap.org/ws/2005/02/trust/RST/SCT/Cancel</a>
0x112	<a href="http://schemas.xmlsoap.org/ws/2005/02/trust/RSTR/SCT/Cancel">http://schemas.xmlsoap.org/ws/2005/02/trust/RSTR/SCT/Cancel</a>
0x114	<a href="http://www.w3.org/2001/04/xmlenc#aes128-cbc">http://www.w3.org/2001/04/xmlenc#aes128-cbc</a>
0x116	<a href="http://www.w3.org/2001/04/xmlenc#kw-aes128">http://www.w3.org/2001/04/xmlenc#kw-aes128</a>
0x118	<a href="http://www.w3.org/2001/04/xmlenc#aes192-cbc">http://www.w3.org/2001/04/xmlenc#aes192-cbc</a>
0x11A	<a href="http://www.w3.org/2001/04/xmlenc#kw-aes192">http://www.w3.org/2001/04/xmlenc#kw-aes192</a>
0x11C	<a href="http://www.w3.org/2001/04/xmlenc#aes256-cbc">http://www.w3.org/2001/04/xmlenc#aes256-cbc</a>
0x11E	<a href="http://www.w3.org/2001/04/xmlenc#kw-aes256">http://www.w3.org/2001/04/xmlenc#kw-aes256</a>

Value	Characters
0x120	<a href="http://www.w3.org/2001/04/xmlenc#des-cbc">http://www.w3.org/2001/04/xmlenc#des-cbc</a>
0x122	<a href="http://www.w3.org/2000/09/xmldsig#dsa-sha1">http://www.w3.org/2000/09/xmldsig#dsa-sha1</a>
0x124	<a href="http://www.w3.org/2001/10/xml-exc-c14n#WithComments">http://www.w3.org/2001/10/xml-exc-c14n#WithComments</a>
0x126	<a href="http://www.w3.org/2000/09/xmldsig#hmac-sha1">http://www.w3.org/2000/09/xmldsig#hmac-sha1</a>
0x128	<a href="http://www.w3.org/2001/04/xmldsig-more#hmac-sha256">http://www.w3.org/2001/04/xmldsig-more#hmac-sha256</a>
0x12A	<a href="http://schemas.xmlsoap.org/ws/2005/02/sc/dk/p_sha1">http://schemas.xmlsoap.org/ws/2005/02/sc/dk/p_sha1</a>
0x12C	<a href="http://www.w3.org/2001/04/xmlenc#ripemd160">http://www.w3.org/2001/04/xmlenc#ripemd160</a>
0x12E	<a href="http://www.w3.org/2001/04/xmlenc#rsa-oaep-mgf1p">http://www.w3.org/2001/04/xmlenc#rsa-oaep-mgf1p</a>
0x130	<a href="http://www.w3.org/2000/09/xmldsig#rsa-sha1">http://www.w3.org/2000/09/xmldsig#rsa-sha1</a>
0x132	<a href="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256">http://www.w3.org/2001/04/xmldsig-more#rsa-sha256</a>
0x134	<a href="http://www.w3.org/2001/04/xmlenc#rsa-1_5">http://www.w3.org/2001/04/xmlenc#rsa-1_5</a>
0x136	<a href="http://www.w3.org/2000/09/xmldsig#sha1">http://www.w3.org/2000/09/xmldsig#sha1</a>
0x138	<a href="http://www.w3.org/2001/04/xmlenc#sha256">http://www.w3.org/2001/04/xmlenc#sha256</a>
0x13A	<a href="http://www.w3.org/2001/04/xmlenc#sha512">http://www.w3.org/2001/04/xmlenc#sha512</a>
0x13C	<a href="http://www.w3.org/2001/04/xmlenc#tripleDES-cbc">http://www.w3.org/2001/04/xmlenc#tripleDES-cbc</a>
0x13E	<a href="http://www.w3.org/2001/04/xmlenc#kw-tripleDES">http://www.w3.org/2001/04/xmlenc#kw-tripleDES</a>
0x140	<a href="http://schemas.xmlsoap.org/2005/02/trust/tlsnego#TLS_Wrap">http://schemas.xmlsoap.org/2005/02/trust/tlsnego#TLS_Wrap</a>
0x142	<a href="http://schemas.xmlsoap.org/2005/02/trust/spnego#GSS_Wrap">http://schemas.xmlsoap.org/2005/02/trust/spnego#GSS_Wrap</a>
0x144	<a href="http://schemas.microsoft.com/ws/2006/05/security">http://schemas.microsoft.com/ws/2006/05/security</a>
0x146	dnse
0x148	o
0x14A	Password
0x14C	PasswordText
0x14E	Username
0x150	UsernameToken
0x152	BinarySecurityToken
0x154	EncodingType
0x156	KeyIdentifier
0x158	<a href="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0#Base64Binary">http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0#Base64Binary</a>
0x15A	<a href="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0#HexBinary">http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0#HexBinary</a>
0x15C	<a href="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0#Text">http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0#Text</a>

Value	Characters
0x15E	<a href="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-x509-token-profile-1.0#X509SubjectKeyIdentifier">http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-x509-token-profile-1.0#X509SubjectKeyIdentifier</a>
0x160	<a href="http://docs.oasis-open.org/wss/oasis-wss-kerberos-token-profile-1.1#GSS_Kerberosv5_AP_REQ">http://docs.oasis-open.org/wss/oasis-wss-kerberos-token-profile-1.1#GSS_Kerberosv5_AP_REQ</a>
0x162	<a href="http://docs.oasis-open.org/wss/oasis-wss-kerberos-token-profile-1.1#GSS_Kerberosv5_AP_REQ1510">http://docs.oasis-open.org/wss/oasis-wss-kerberos-token-profile-1.1#GSS_Kerberosv5_AP_REQ1510</a>
0x164	<a href="http://docs.oasis-open.org/wss/oasis-wss-saml-token-profile-1.0#SAMLAssertionID">http://docs.oasis-open.org/wss/oasis-wss-saml-token-profile-1.0#SAMLAssertionID</a>
0x166	Assertion
0x168	urn:oasis:names:tc:SAML:1.0:assertion
0x16A	<a href="http://docs.oasis-open.org/wss/oasis-wss-rel-token-profile-1.0.pdf#license">http://docs.oasis-open.org/wss/oasis-wss-rel-token-profile-1.0.pdf#license</a>
0x16C	FailedAuthentication
0x16E	InvalidSecurityToken
0x170	InvalidSecurity
0x172	k
0x174	SignatureConfirmation
0x176	TokenType
0x178	<a href="http://docs.oasis-open.org/wss/oasis-wss-soap-message-security-1.1#ThumbprintSHA1">http://docs.oasis-open.org/wss/oasis-wss-soap-message-security-1.1#ThumbprintSHA1</a>
0x17A	<a href="http://docs.oasis-open.org/wss/oasis-wss-soap-message-security-1.1#EncryptedKey">http://docs.oasis-open.org/wss/oasis-wss-soap-message-security-1.1#EncryptedKey</a>
0x17C	<a href="http://docs.oasis-open.org/wss/oasis-wss-soap-message-security-1.1#EncryptedKeySHA1">http://docs.oasis-open.org/wss/oasis-wss-soap-message-security-1.1#EncryptedKeySHA1</a>
0x17E	<a href="http://docs.oasis-open.org/wss/oasis-wss-saml-token-profile-1.1#SAMLV1.1">http://docs.oasis-open.org/wss/oasis-wss-saml-token-profile-1.1#SAMLV1.1</a>
0x180	<a href="http://docs.oasis-open.org/wss/oasis-wss-saml-token-profile-1.1#SAMLV2.0">http://docs.oasis-open.org/wss/oasis-wss-saml-token-profile-1.1#SAMLV2.0</a>
0x182	<a href="http://docs.oasis-open.org/wss/oasis-wss-saml-token-profile-1.1#SAMLID">http://docs.oasis-open.org/wss/oasis-wss-saml-token-profile-1.1#SAMLID</a>
0x184	AUTH-HASH
0x186	RequestSecurityTokenResponse
0x188	KeySize
0x18A	RequestedTokenReference
0x18C	AppliesTo
0x18E	Authenticator
0x190	CombinedHash
0x192	BinaryExchange
0x194	Lifetime
0x196	RequestedSecurityToken
0x198	Entropy
0x19A	RequestedProofToken

<b>Value</b>	<b>Characters</b>
0x19C	ComputedKey
0x19E	RequestSecurityToken
0x1A0	RequestType
0x1A2	Context
0x1A4	BinarySecret
0x1A6	http://schemas.xmlsoap.org/ws/2005/02/trust/spnego
0x1A8	http://schemas.xmlsoap.org/ws/2005/02/trust/tlsnego
0x1AA	wst
0x1AC	http://schemas.xmlsoap.org/ws/2004/04/trust
0x1AE	http://schemas.xmlsoap.org/ws/2004/04/security/trust/RST/Issue
0x1B0	http://schemas.xmlsoap.org/ws/2004/04/security/trust/RSTR/Issue
0x1B2	http://schemas.xmlsoap.org/ws/2004/04/security/trust/Issue
0x1B4	http://schemas.xmlsoap.org/ws/2004/04/security/trust/CK/PSHA1
0x1B6	http://schemas.xmlsoap.org/ws/2004/04/security/trust/SymmetricKey
0x1B8	http://schemas.xmlsoap.org/ws/2004/04/security/trust/Nonce
0x1BA	KeyType
0x1BC	http://schemas.xmlsoap.org/ws/2004/04/trust/SymmetricKey
0x1BE	http://schemas.xmlsoap.org/ws/2004/04/trust/PublicKey
0x1C0	Claims
0x1C2	InvalidRequest
0x1C4	RequestFailed
0x1C6	SignWith
0x1C8	EncryptWith
0x1CA	EncryptionAlgorithm
0x1CC	CanonicalizationAlgorithm
0x1CE	ComputedKeyAlgorithm
0x1D0	UseKey
0x1D2	http://schemas.microsoft.com/net/2004/07/secext/WS-SPNegot
0x1D4	http://schemas.microsoft.com/net/2004/07/secext/TLSNegot
0x1D6	t
0x1D8	http://schemas.xmlsoap.org/ws/2005/02/trust/RST/Issue
0x1DA	http://schemas.xmlsoap.org/ws/2005/02/trust/RSTR/Issue

<b>Value</b>	<b>Characters</b>
0x1DC	http://schemas.xmlsoap.org/ws/2005/02/trust/Issue
0x1DE	http://schemas.xmlsoap.org/ws/2005/02/trust/SymmetricKey
0x1E0	http://schemas.xmlsoap.org/ws/2005/02/trust/CK/PSHA1
0x1E2	http://schemas.xmlsoap.org/ws/2005/02/trust/Nonce
0x1E4	RenewTarget
0x1E6	CancelTarget
0x1E8	RequestedTokenCancelled
0x1EA	RequestedAttachedReference
0x1EC	RequestedUnattachedReference
0x1EE	IssuedTokens
0x1F0	http://schemas.xmlsoap.org/ws/2005/02/trust/Renew
0x1F2	http://schemas.xmlsoap.org/ws/2005/02/trust/Cancel
0x1F4	http://schemas.xmlsoap.org/ws/2005/02/trust/PublicKey
0x1F6	Access
0x1F8	AccessDecision
0x1FA	Advice
0x1FC	AssertionID
0x1FE	AssertionIDReference
0x200	Attribute
0x202	AttributeName
0x204	AttributeNamespace
0x206	AttributeStatement
0x208	AttributeValue
0x20A	Audience
0x20C	AudienceRestrictionCondition
0x20E	AuthenticationInstant
0x210	AuthenticationMethod
0x212	AuthenticationStatement
0x214	AuthorityBinding
0x216	AuthorityKind
0x218	AuthorizationDecisionStatement
0x21A	Binding



<b>Value</b>	<b>Characters</b>
0x21C	Condition
0x21E	Conditions
0x220	Decision
0x222	DoNotCacheCondition
0x224	Evidence
0x226	IssueInstant
0x228	Issuer
0x22A	Location
0x22C	MajorVersion
0x22E	MinorVersion
0x230	NameIdentifier
0x232	Format
0x234	NameQualifier
0x236	Namespace
0x238	NotBefore
0x23A	NotOnOrAfter
0x23C	saml
0x23E	Statement
0x240	Subject
0x242	SubjectConfirmation
0x244	SubjectConfirmationData
0x246	ConfirmationMethod
0x248	urn:oasis:names:tc:SAML:1.0:cm:holder-of-key
0x24A	urn:oasis:names:tc:SAML:1.0:cm:sender-vouches
0x24C	SubjectLocality
0x24E	DNSAddress
0x250	IPAddress
0x252	SubjectStatement
0x254	urn:oasis:names:tc:SAML:1.0:am:unspecified
0x256	xmlns
0x258	Resource
0x25A	UserName

<b>Value</b>	<b>Characters</b>
0x25C	urn:oasis:names:tc:SAML:1.1:nameid-format:WindowsDomainQualifiedName
0x25E	EmailName
0x260	urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress
0x262	u
0x264	ChannelInstance
0x266	http://schemas.microsoft.com/ws/2005/02/duplex
0x268	Encoding
0x26A	MimeType
0x26C	CarriedKeyName
0x26E	Recipient
0x270	EncryptedKey
0x272	KeyReference
0x274	e
0x276	http://www.w3.org/2001/04/xmlenc#Element
0x278	http://www.w3.org/2001/04/xmlenc#Content
0x27A	KeyName
0x27C	MgmtData
0x27E	KeyValue
0x280	RSAKeyValue
0x282	Modulus
0x284	Exponent
0x286	X509Data
0x288	X509IssuerSerial
0x28A	X509IssuerName
0x28C	X509SerialNumber
0x28E	X509Certificate
0x290	AckRequested
0x292	http://schemas.xmlsoap.org/ws/2005/02/rm/AckRequested
0x294	AcksTo
0x296	Accept
0x298	CreateSequence
0x29A	http://schemas.xmlsoap.org/ws/2005/02/rm/CreateSequence

<b>Value</b>	<b>Characters</b>
0x29C	CreateSequenceRefused
0x29E	CreateSequenceResponse
0x2A0	http://schemas.xmlsoap.org/ws/2005/02/rm/CreateSequenceResponse
0x2A2	FaultCode
0x2A4	InvalidAcknowledgement
0x2A6	LastMessage
0x2A8	http://schemas.xmlsoap.org/ws/2005/02/rm/LastMessage
0x2AA	LastMessageNumberExceeded
0x2AC	MessageNumberRollover
0x2AE	Nack
0x2B0	netrm
0x2B2	Offer
0x2B4	r
0x2B6	SequenceFault
0x2B8	SequenceTerminated
0x2BA	TerminateSequence
0x2BC	http://schemas.xmlsoap.org/ws/2005/02/rm/TerminateSequence
0x2BE	UnknownSequence
0x2C0	http://schemas.microsoft.com/ws/2006/02/tx/oletx
0x2C2	oletx
0x2C4	OleTxTransaction
0x2C6	PropagationToken
0x2C8	http://schemas.xmlsoap.org/ws/2004/10/wscoor
0x2CA	wscoor
0x2CC	CreateCoordinationContext
0x2CE	CreateCoordinationContextResponse
0x2D0	CoordinationContext
0x2D2	CurrentContext
0x2D4	CoordinationType
0x2D6	RegistrationService
0x2D8	Register
0x2DA	RegisterResponse

<b>Value</b>	<b>Characters</b>
0x2DC	ProtocolIdentifier
0x2DE	CoordinatorProtocolService
0x2E0	ParticipantProtocolService
0x2E2	http://schemas.xmlsoap.org/ws/2004/10/wscoor/CreateCoordinationContext
0x2E4	http://schemas.xmlsoap.org/ws/2004/10/wscoor/CreateCoordinationContextResponse
0x2E6	http://schemas.xmlsoap.org/ws/2004/10/wscoor/Register
0x2E8	http://schemas.xmlsoap.org/ws/2004/10/wscoor/RegisterResponse
0x2EA	http://schemas.xmlsoap.org/ws/2004/10/wscoor/fault
0x2EC	ActivationCoordinatorPortType
0x2EE	RegistrationCoordinatorPortType
0x2F0	InvalidState
0x2F2	InvalidProtocol
0x2F4	InvalidParameters
0x2F6	NoActivity
0x2F8	ContextRefused
0x2FA	AlreadyRegistered
0x2FC	http://schemas.xmlsoap.org/ws/2004/10/wsat
0x2FE	wsat
0x300	http://schemas.xmlsoap.org/ws/2004/10/wsat/Completion
0x302	http://schemas.xmlsoap.org/ws/2004/10/wsat/Durable2PC
0x304	http://schemas.xmlsoap.org/ws/2004/10/wsat/Volatile2PC
0x306	Prepare
0x308	Prepared
0x30A	ReadOnly
0x30C	Commit
0x30E	Rollback
0x310	Committed
0x312	Aborted
0x314	Replay
0x316	http://schemas.xmlsoap.org/ws/2004/10/wsat/Commit
0x318	http://schemas.xmlsoap.org/ws/2004/10/wsat/Rollback
0x31A	http://schemas.xmlsoap.org/ws/2004/10/wsat/Committed

<b>Value</b>	<b>Characters</b>
0x31C	<a href="http://schemas.xmlsoap.org/ws/2004/10/wsat/Aborted">http://schemas.xmlsoap.org/ws/2004/10/wsat/Aborted</a>
0x31E	<a href="http://schemas.xmlsoap.org/ws/2004/10/wsat/Prepare">http://schemas.xmlsoap.org/ws/2004/10/wsat/Prepare</a>
0x320	<a href="http://schemas.xmlsoap.org/ws/2004/10/wsat/Prepared">http://schemas.xmlsoap.org/ws/2004/10/wsat/Prepared</a>
0x322	<a href="http://schemas.xmlsoap.org/ws/2004/10/wsat/ReadOnly">http://schemas.xmlsoap.org/ws/2004/10/wsat/ReadOnly</a>
0x324	<a href="http://schemas.xmlsoap.org/ws/2004/10/wsat/Replay">http://schemas.xmlsoap.org/ws/2004/10/wsat/Replay</a>
0x326	<a href="http://schemas.xmlsoap.org/ws/2004/10/wsat/fault">http://schemas.xmlsoap.org/ws/2004/10/wsat/fault</a>
0x328	CompletionCoordinatorPortType
0x32A	CompletionParticipantPortType
0x32C	CoordinatorPortType
0x32E	ParticipantPortType
0x330	InconsistentInternalState
0x332	mstx
0x334	Enlistment
0x336	protocol
0x338	LocalTransactionId
0x33A	IsolationLevel
0x33C	IsolationFlags
0x33E	Description
0x340	Loopback
0x342	RegisterInfo
0x344	ContextId
0x346	TokenId
0x348	AccessDenied
0x34A	InvalidPolicy
0x34C	CoordinatorRegistrationFailed
0x34E	TooManyEnlistments
0x350	Disabled
0x352	ActivityId
0x354	<a href="http://schemas.microsoft.com/2004/09/ServiceModel/Diagnostics">http://schemas.microsoft.com/2004/09/ServiceModel/Diagnostics</a>
0x356	<a href="http://docs.oasis-open.org/wss/oasis-wss-kerberos-token-profile-1.1#Kerberosv5APREQSHA1">http://docs.oasis-open.org/wss/oasis-wss-kerberos-token-profile-1.1#Kerberosv5APREQSHA1</a>
0x358	<a href="http://schemas.xmlsoap.org/ws/2002/12/policy">http://schemas.xmlsoap.org/ws/2002/12/policy</a>
0x35A	FloodMessage

<b>Value</b>	<b>Characters</b>
0x35C	LinkUtility
0x35E	Hops
0x360	http://schemas.microsoft.com/net/2006/05/peer/HopCount
0x362	PeerVia
0x364	http://schemas.microsoft.com/net/2006/05/peer
0x366	PeerFlooder
0x368	PeerTo
0x36A	http://schemas.microsoft.com/ws/2005/05/routing
0x36C	PacketRoutable
0x36E	http://schemas.microsoft.com/ws/2005/05/addressing/none
0x370	http://schemas.microsoft.com/ws/2005/05/envelope/none
0x372	http://www.w3.org/2001/XMLSchema-instance
0x374	http://www.w3.org/2001/XMLSchema
0x376	nil
0x378	type
0x37A	char
0x37C	boolean
0x37E	byte
0x380	unsignedByte
0x382	short
0x384	unsignedShort
0x386	int
0x388	unsignedInt
0x38A	long
0x38C	unsignedLong
0x38E	float
0x390	double
0x392	decimal
0x394	dateTime
0x396	string
0x398	base64Binary
0x39A	anyType

<b>Value</b>	<b>Characters</b>
0x39C	duration
0x39E	guid
0x3A0	anyURI
0x3A2	QName
0x3A4	time
0x3A6	date
0x3A8	hexBinary
0x3AA	gYearMonth
0x3AC	gYear
0x3AE	gMonthDay
0x3B0	gDay
0x3B2	gMonth
0x3B4	integer
0x3B6	positiveInteger
0x3B8	negativeInteger
0x3BA	nonPositiveInteger
0x3BC	nonNegativeInteger
0x3BE	normalizedString
0x3C0	ConnectionLimitReached
0x3C2	<a href="http://schemas.xmlsoap.org/soap/envelope/">http://schemas.xmlsoap.org/soap/envelope/</a>
0x3C4	actor
0x3C6	faultcode
0x3C8	faultstring
0x3CA	faultactor
0x3CC	detail

### 3 Structure Examples

Following is an example of how to encode a SOAP document in the SOAP data structure format by using the **strings** specified in section 2. White space (such as spaces, tab characters, and carriage returns) improves readability, but is not part of the encoded version of the document.

```
<s:Envelope xmlns:a="http://www.w3.org/2005/08/addressing"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  <s:Header>
    <a:Action s:mustUnderstand="1">action</a:Action>
  </s:Header>
  <s:Body>
    <Inventory>0</Inventory>
  </s:Body>
</s:Envelope>
```

The following table divides the same SOAP document into **records**. Each row in the table represents one record. The first column identifies the text, or record content. The second column identifies the type of SOAP record. The third column shows the record in its encoded form. For information on the structure of each record, see [\[MC-NBFX\]](#).

String to encode	Record type	Encoded bytes (hex)
<s:Envelope	PrefixDictionaryElementS	56 <b>02</b>
xmlns:a="http://www.w3.org/2005/08/addressing"	DictionaryXmlnsAttribute	0B 01 61 <b>06</b>
xmlns:s="http://www.w3.org/2003/05/soap-envelope">	DictionaryXmlnsAttribute	0B 01 73 <b>04</b>
<s:Header>	PrefixDictionaryElementS	56 <b>08</b>
<a:Action	PrefixDictionaryElementA	44 <b>0A</b>
s:mustUnderstand="1">	PrefixDictionaryAttributeS	1E <b>00</b> 82
action</a:Action>	Chars8TextWithEndElement	99 06 61 63 74 69 6F 6E
</s:Header>	EndElement	01
<s:Body>	PrefixDictionaryElementS	56 <b>0E</b>
<Inventory>	ShortElement	40 09 49 6E 76 65 6E 74 6F 72 79
0</Inventory>	ZeroTextWithEndElement	81
</s:Body>	EndElement	01
</s:Envelope>	EndElement	01

Several of the records contain [DictionaryString](#) entries, as specified in section 2. The bytes that map to DictionaryString entries are highlighted in **bold** in records 1 through 6, and in record 9.

Finally, the following diagram shows the SOAP document as a byte stream.

```
56 02 0B 01 61 06 0B 01 73 04 56 08 44 0A 1E 00
82 99 06 61 63 74 69 6F 6E 01 56 0E 40 09 49 6E
76 65 6E 74 6F 72 79 81 01 01
```



## 4 Security Considerations

For information on security considerations, see [\[MC-NBFX\]](#) section 1.3.

## 5 Appendix A: Product Behavior

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

This document specifies version-specific details in the Microsoft .NET Framework. The following versions of .NET Framework are available in the following released Windows product or as supplemental software, see **.NET Framework**.

- Microsoft .NET Framework 3.0
- Microsoft .NET Framework 3.5
- Microsoft .NET Framework 4.0
- Microsoft .NET Framework 4.5
- Microsoft .NET Framework 4.6

Exceptions, if any, are noted below. If a service pack or Quick Fix Engineering (QFE) number appears with the product version, behavior changed in that service pack or QFE. The new behavior also applies to subsequent service packs of the product 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.

## 6 Change Tracking

This section identifies changes that were made to this document since the last release. Changes are classified as New, Major, Minor, Editorial, or No change.

The revision class **New** means that a new document is being released.

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

- A document revision that incorporates changes to interoperability requirements or functionality.
- The removal of a document from the documentation set.

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

The revision class **Editorial** means that the formatting in the technical content was changed. Editorial changes apply to grammatical, formatting, and style issues.

The revision class **No change** means that no new technical changes were introduced. Minor editorial and formatting changes may have been made, but the technical content of the document is identical to the last released version.

Major and minor changes can be described further using the following change types:

- New content added.
- Content updated.
- Content removed.
- New product behavior note added.
- Product behavior note updated.
- Product behavior note removed.
- New protocol syntax added.
- Protocol syntax updated.
- Protocol syntax removed.
- New content added due to protocol revision.
- Content updated due to protocol revision.
- Content removed due to protocol revision.
- New protocol syntax added due to protocol revision.
- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- Obsolete document removed.

Editorial changes are always classified with the change type **Editorially updated**.

Some important terms used in the change type descriptions are defined as follows:

- **Protocol syntax** refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.
- **Protocol revision** refers to changes made to a protocol that affect the bits that are sent over the wire.

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

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
<a href="#">5</a> Appendix A: Product Behavior	Added .NET Framework 4.6 to the applicability list.	Y	Content update.

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