

[MC-NBFSE]: .NET Binary Format: SOAP Extension

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Revision Summary

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09/28/2007	0.2	Minor	Updated the technical content.
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1 Introduction

This specification defines the .NET Binary Format: SOAP Extension, which is a new format built by extending the format specified in [MC-NBFS]. The .NET Binary Format: SOAP Extension is designed to work within the .NET Message Framing Protocol, as specified in [MC-NMF], to provide a context under which [strings](#) may be transmitted once and referred to by subsequent documents in order to reduce the overall size of the documents.

1.1 Glossary

The following terms are defined in [\[MS-GLOS\]](#):

XML

The following terms are defined in [\[MC-NBFX\]](#):

DictionaryString
MultiByteInt31
Record
String

The following terms are specific to this document:

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

1.2 References

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site, <http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624>, as an additional source.

[MC-NBFS] Microsoft Corporation, "[.NET Binary Format: SOAP Data Structure](#)", July 2007.

[MC-NBFX] Microsoft Corporation, "[.NET Binary Format: XML Data Structure](#)", July 2007.

[MC-NMF] Microsoft Corporation, "[.NET Message Framing Protocol Specification](#)", October 2007.

[MS-GLOS] Microsoft Corporation, "[Windows Protocols Master Glossary](#)", March 2007.

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

[SOAP1.2/1] Gudgin, M., Hadley, M., Mendelsohn, N., Moreau, J., and Nielsen, H.F., "SOAP Version 1.2 Part 1: Messaging Framework", W3C Recommendation, June 2003, <http://www.w3.org/TR/2003/REC-soap12-part1-20030624>

1.2.2 Informative References

This structure has no informative references.

1.3 Structure Overview (Synopsis)

This .NET Binary Format: SOAP Extension is used to efficiently represent SOAP documents, as specified in [\[SOAP1.2/1\]](#). When multiple documents are being processed, this format may be more efficient than the .NET Binary Format: SOAP Data Structure, as specified in [MC-NBFS].

1.4 Relationship to Protocols and Other Structures

The .NET Binary Format: SOAP Extension uses the .NET Binary Format: SOAP Data Structure, as specified in [MC-NBFS].

The .NET Message Framing Protocol, as specified in [\[MC-NMF\]](#), uses the .NET Binary Format: SOAP Extension.

1.5 Applicability Statement

The .NET Binary Format: SOAP Extension is a general purpose way to process a series of SOAP documents, and is applied in the same way as specified in [MC-NBFS] section 1.5. Additionally, the format is particularly well-suited for environments where a series of SOAP documents that share a common or repetitive vocabulary are processed.

1.6 Versioning and Localization

For information on versioning and localization, see [MC-NBFS] section 1.6.

1.7 Vendor-Extensible Fields

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

2 Structures

The structures in the .NET Binary Format: SOAP Extension are identical to those specified in [MC-NBFS], except for the addition of one new structure and a further extension of the [DictionaryString](#) structure, as specified in [MC-NBFS] section 2.1.

The format is identical to the .NET Binary Format: SOAP Data Structure, as specified in [MC-NBFS], except that the document MUST be preceded by a **StringTable** structure, as specified in section [2.1](#).

2.1 StringTable

The StringTable structure describes a set of new **strings** that subsequent **records** can refer to.

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
Size (variable)																															
...																															
Strings (variable)																															
...																															

Size (variable): An integer value that is encoded by using the [MultiByteInt31](#) structure that indicates the overall size in bytes of the [strings](#) structures that follow.

Strings (variable): A series of strings. The **Strings** MUST fit exactly within the **Size** specified. Each **String** MUST be unique and MUST NOT have been present in a prior StringTable.

The first **String** of the first StringTable is assigned an ID of 1, and each subsequent **String** is assigned the next higher odd number. A consumer of this format MUST maintain this mapping until there are no further documents to process. Subsequent records and documents will refer to this **String** by this ID, as specified in section [2.2](#).

2.2 DictionaryString

The DictionaryString structure describes a reference to a set 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 integer value that is encoded by using the [MultiByteInt31](#) structure. If this value is even, then it MUST be interpreted as specified in [MC-NBFS] section 2. If this value is

odd, then it MUST refer to a **String** from a [StringTable](#) structure that has been processed and MUST be interpreted as the set of characters identified by that **String**.

3 Structure Examples

The following example is of a SOAP document that uses the .NET Binary Format: SOAP Extension format.

Note that the document is the same document that is encoded in [MC-NBFS] section 3.

```
<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>
```

Because the content "action" in the <Action> element is not present in the [string](#) structure as described in [MC-NBFS] section 2, the string was written out fully.

Bytes (hex)	Records	Characters Represented
99 06 61 63 74 69 6F 6E	Chars8TextWithEndElement	action</a:Action>

Similarly, because the Inventory string was also not present, the <Inventory> element was written out verbosely.

Bytes (hex)	Records	Characters Represented
40 09 49 6E 76 65 6E 74 6F 72 79	ShortElement	<Inventory>

If this document, or a similar document, is processed repeatedly, then it is advantageous not have to repeat these bytes.

Using the .NET Binary Format: SOAP Extension, a [StringTable \(section 2.1\)](#) would be used first to describe the two strings.

- action
- Inventory

According to the StringTable structure, these strings MUST be encoded as shown in the following table. The Bytes column contains the bytes of the structure shown in hex, while the Chars column contains the same bytes shown as characters.

Bytes (hex)	Chars (hex)
11 06 61 63 74 69 6F 6E 09 49 6E 76 65 6E 74 6F 72 79	..action.Inventory

The bolded items in the table above are the size (0x11) of the overall structure encoded using **MultiByteInt31** and the start of the two strings (0x06, 0x09) encoded using MultiByteInt31 as well. The string "action" is assigned a value of 1 and Inventory is assigned a value of 3, as specified in section [2](#).

Now, the two preceding [records](#) can be encoded more compactly, as shown in the following tables.

Bytes (hex)	Records	Characters Represented
AB 01	DictionaryTextWithEndElement	action</a:Action>

Bytes (hex)	Records	Characters Represented
42 03	ShortDictionaryElement	<Inventory>

The references to the string from the StringTable are in bold.

4 Security Considerations

The .NET Binary Format: SOAP Extension has the same security considerations as the .NET Binary Format: SOAP Data Structure, as specified in [MC-NBFS] section 4, and the .NET Binary Format: **XML** Data Structure, as specified in [MC-NBFX] section 4.

Consumers of this format SHOULD consider limiting the size of [StringTables \(section 2.1\)](#) processed. In addition to requiring the consumer to allocate memory to store the information, StringTables also represent a way to refer to a potentially large piece of information by using a small piece of information. Without any limits, it might be possible for a malicious producer to leverage this behavior and devise a document that causes an unsuspecting consumer to use significantly more memory than it might otherwise expect.

5 Appendix A: Windows Behavior

The information in this specification is applicable to the following versions of Windows:

- Windows Vista
- Windows XP
- Windows Server 2003
- Windows 2000
- Windows NT 4.0

Exceptions, if any, are noted below. Unless otherwise specified, any statement of optional behavior in this specification prescribed using the terms SHOULD or SHOULD NOT implies Windows behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that Windows does not follow the prescription.

This structure has no Windows-specific behaviors.

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