

# ASN1C

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ASN.1 Compiler  
Version 7.0  
C# BER/DER/PER/XER/XML  
Reference Manual



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# Chapter 1

## Class Documentation

### 1.1 Asn1BerDecodeBuffer Class Reference

Inherited by [Asn1BerInputStream](#), and [Asn1DerDecodeBuffer](#).

#### Public Member Functions

- [Asn1BerDecodeBuffer](#) (System.IO.Stream istream)
- [Asn1BerDecodeBuffer](#) (byte[] msgdata)
- int [DecodeEnumValue](#) (Asn1Tag tag, bool explicitTagging, int implicitLength)
- int [DecodeEnumValue](#) (bool explicitTagging, int implicitLength)
- virtual int [DecodeLength](#) ()
- virtual byte[] [DecodeOpenType](#) (bool saveData)
- virtual byte[] [DecodeOpenType](#) ()
- virtual void [DecodeTag](#) (Asn1Tag tag)
- virtual int [DecodeTagAndLength](#) (Asn1Tag tag)
- virtual bool [MatchTag](#) (Asn1Tag tag)
- virtual bool [MatchTag](#) (Asn1Tag tag, Asn1Tag parsedTag, IntHolder parsedLen)
- virtual bool [MatchTag](#) (short tagClass, short tagForm, int tagIDCode, Asn1Tag parsedTag, IntHolder parsedLen)
- virtual void [Parse](#) ([Asn1TaggedEventHandler](#) handler)
- virtual Asn1Tag [PeekTag](#) ()
- virtual void [PeekTag](#) (Asn1Tag parsedTag)
- override int [ReadByte](#) ()

#### Static Public Member Functions

- static int [CalcIndefLen](#) (byte[] data, int offset, int len)

#### Protected Member Functions

- internal void [MovePastEOC](#) (bool saveData)

#### Properties

- virtual Asn1Tag [LastTag](#) [get]

### 1.1.1 Detailed Description

This class handles the decoding of ASN.1 messages as specified in the Basic Encoding Rules (BER) as documented in the ITU-T X.690 standard.

### 1.1.2 Constructor & Destructor Documentation

#### 1.1.2.1 Asn1BerDecodeBuffer (byte[] *msgdata*)

This constructor creates a BER Decode buffer object that references an encoded ASN.1 message.

##### Parameters

*msgdata* Byte array containing an encoded ASN.1 message.

#### 1.1.2.2 Asn1BerDecodeBuffer (System.IO.Stream *istream*)

This constructor creates a BER Decode buffer object that references an encoded ASN.1 message. In this case, the message is passed in using an System.IO.Stream object.

##### Parameters

*istream* Input stream containing an encoded ASN.1 message.

### 1.1.3 Member Function Documentation

#### 1.1.3.1 static int CalcIndefLen (byte[] *data*, int *offset*, int *len*) [static]

This function calculates the actual length of an indefinite length message component.

##### Parameters

*data* Buffer with the indefinite length message component.

*offset* The start offset in the array

*len* Length of the buffer (beginning from the offset)

##### Returns

calculated length

#### 1.1.3.2 int DecodeEnumValue (Asn1Tag *tag*, bool *explicitTagging*, int *implicitLength*)

This method decodes an enumerated value from the buffer.

##### Parameters

*tag* An Asn1Tag value for enumerated values that are tagged other than UNIVERSAL 10.

*explicitTagging* A flag that indicates the element is explicitly tagged.

*implicitLength* The length of the contents if implicitly tagged.

##### Returns

The decoded integer value.

### 1.1.3.3 int DecodeEnumValue (bool *explicitTagging*, int *implicitLength*)

This method decodes an enumerated value from the buffer.

#### Parameters

*explicitTagging* A flag that indicates the element is explicitly tagged.

*implicitLength* The length of the contents if implicitly tagged.

#### Returns

The decoded integer value.

### 1.1.3.4 virtual int DecodeLength () [virtual]

This method decodes a length value.

#### Returns

Decoded length value

### 1.1.3.5 virtual byte [] DecodeOpenType (bool *saveData*) [virtual]

This method decodes an ASN.1 BER open type value. This is a fully encoded message component of any type. This version of the method allows the option of saving or discarding the open type data.

#### Parameters

*saveData* True if data should be captured and returned

#### Returns

Reference to byte array containing component.

### 1.1.3.6 virtual byte [] DecodeOpenType () [virtual]

This method decodes an ASN.1 BER open type value. This is a fully encoded message component of any type. The component is captured in the Decode capture buffer and a reference to a byte array is returned containing the component.

#### Returns

Reference to byte array containing component.

### 1.1.3.7 virtual void DecodeTag (Asn1Tag *tag*) [virtual]

This method decodes a tag value.

#### Parameters

*tag* Tag object to receive decoded tag fields.

#### Returns

status value (see Asn1Status.java)

### 1.1.3.8 virtual int DecodeTagAndLength (Asn1Tag *tag*) [virtual]

This method decodes a tag and length value.

#### Parameters

*tag* Tag object to receive decoded tag fields.

#### Returns

Decoded length value.

### 1.1.3.9 virtual bool MatchTag (Asn1Tag *tag*) [virtual]

This overloaded version of MatchTag will just test for a match and not return parsed tag and length values

#### Parameters

*tag* Tag value to be matched.

#### Returns

True if given tag matches tag at Decode cursor

### 1.1.3.10 virtual bool MatchTag (Asn1Tag *tag*, Asn1Tag *parsedTag*, IntHolder *parsedLen*) [virtual]

This overloaded version of MatchTag allows the tag value to be matched to be passed using an Asn1Tag object.

#### Parameters

*tag* Tag value to be matched.

*parsedTag* Holder object to receive parsed tag value

*parsedLen* Holder object to receive parsed length value

#### Returns

True if given tag matches tag at Decode cursor

### 1.1.3.11 virtual bool MatchTag (short *tagClass*, short *tagForm*, int *tagIDCode*, Asn1Tag *parsedTag*, IntHolder *parsedLen*) [virtual]

This method decodes the next tag value and checks for a match with the given tag value. If the match is successful, the Decode cursor will be positioned at the contents field; otherwise, it will be reset to point to the start of the tag field.

#### Parameters

*tagClass* Class value of tag to match

*tagForm* Form value of tag to match

*tagIDCode* ID code of tag to match

*parsedTag* Holder object to receive parsed tag value

*parsedLen* Holder object to receive parsed length value

#### Returns

True if given tag matches tag at Decode cursor



#### 1.1.3.12 internal void MovePastEOC (bool *saveData*) [protected]

This method skips or saves the data/bytes of the current tag in this DecodeBuffer. If current tag has indefinite length, than index will moved to end of the indifinite length. If tag has definite length, than that many bytes are moved.

##### Parameters

*saveData* True if data should be captured

#### 1.1.3.13 virtual void Parse (Asn1TaggedEventHandler *handler*) [virtual]

This method parses the complete message and invokes the event handler callback methods as various items are encountered.

##### Parameters

*handler* Object implementing the Asn1EventHandler interface.

##### Returns

Status value

#### 1.1.3.14 virtual Asn1Tag PeekTag () [virtual]

This overloaded version of the PeekTag method will return a reference to a newly created tag object.

##### Returns

Parsed tag object value reference

#### 1.1.3.15 virtual void PeekTag (Asn1Tag *parsedTag*) [virtual]

This method will Parse and return the next tag in the Decode stream without advancing the Decode cursor.

##### Parameters

*parsedTag* Holder object to receive parsed tag value

#### 1.1.3.16 override int ReadByte ()

This method returns the next available 8-bit value from the input stream. It is implemented differently for BER/DER and PER to take into account odd alignments in PER.

##### Returns

Next 8-bit byte value from input stream

### 1.1.4 Property Documentation

#### 1.1.4.1 virtual Asn1Tag LastTag [get]

Gets the last tag parsed within this decode buffer object.

**Value:** Last parsed tag object reference

## 1.2 Asn1BerDecodeContext Class Reference

### Public Member Functions

- [Asn1BerDecodeContext](#) ([Asn1BerDecodeBuffer](#) decodeBuffer, int elemLength)
- virtual bool [Expired](#) ()
- virtual bool [MatchElemTag](#) ([Asn1Tag](#) tag, [IntHolder](#) parsedLen, bool advance)
- virtual bool [MatchElemTag](#) (short tagClass, short tagForm, int tagIDCode, [IntHolder](#) parsedLen, bool advance)

### Protected Attributes

- internal int [mDecBufByteCount](#)
- internal [Asn1BerDecodeBuffer](#) [mDecodeBuffer](#)
- internal int [mElemLength](#)
- internal bool [mExplicitTagging](#)
- internal [Asn1Tag](#) [mTagHolder](#)

### 1.2.1 Detailed Description

This class is mainly for internal use by the compiler to keep track of where nested constructed elements (SEQUENCE, SET, CHOICE, etc.) begin and end.

### 1.2.2 Constructor & Destructor Documentation

#### 1.2.2.1 [Asn1BerDecodeContext](#) ([Asn1BerDecodeBuffer](#) *decodeBuffer*, int *elemLength*)

The constructor initializes all internal working variables.

#### Parameters

*decodeBuffer* Reference to current Decode buffer method.

*elemLength* Length of the element being tracked.

### 1.2.3 Member Function Documentation

#### 1.2.3.1 virtual bool [Expired](#) () [virtual]

This method will determine if a decoding context is expired. A context is defined to be the wrapper in which a set of elements or a primitive data type resides..

#### Returns

True if at the end of the context block

#### 1.2.3.2 virtual bool [MatchElemTag](#) ([Asn1Tag](#) *tag*, [IntHolder](#) *parsedLen*, bool *advance*) [virtual]

This method will attempt to match the next element tag in a constructed type with the expected value. It will check to see if the context is expired and, if not, will match the given tag with the expected tag. The Decode cursor is advanced if the boolean advance argument is true.

## Parameters

*tag* Tag object representing tag to be matched.  
*parsedLen* Holder object to receive parsed length value  
*advance* True if Decode cursor to be advanced.

## Returns

True, if the tag is matched

### 1.2.3.3 virtual bool MatchElemTag (short *tagClass*, short *tagForm*, int *tagIDCode*, IntHolder *parsedLen*, bool *advance*) [virtual]

This method will attempt to match the next element tag in a constructed type with the expected value. It will check to see if the context is expired and, if not, will match the given tag with the expected tag. The Decode cursor is advanced if the boolean advance argument is true.

## Parameters

*tagClass* Class value of tag to match  
*tagForm* Form value of tag to match  
*tagIDCode* ID code of tag to match  
*parsedLen* Holder object to receive parsed length value  
*advance* True if Decode cursor to be advanced.

## Returns

True, if the tag is matched

## 1.2.4 Member Data Documentation

### 1.2.4.1 internal int mDecBufByteCount [protected]

This variable is used to keep track of the current byte count in the Decode buffer.

### 1.2.4.2 internal Asn1BerDecodeBuffer mDecodeBuffer [protected]

This variable holds a reference to the BER Decode buffer object that is being used to Decode the entire message component.

### 1.2.4.3 internal int mElemLength [protected]

This variable holds the constructed element length for the context component.

### 1.2.4.4 internal bool mExplicitTagging [protected]

This boolean flag variable indicates if explicit tagging is in effect for this element.

### 1.2.4.5 internal Asn1Tag mTagHolder [protected]

This variable holds the current parsed tag for matching operations.

## 1.3 Asn1BerEncodeBuffer Class Reference

Inherited by [Asn1DerEncodeBuffer](#).

### Public Member Functions

- [Asn1BerEncodeBuffer](#) (int sizeIncrement)
- [Asn1BerEncodeBuffer](#) ()
- virtual void [BinDump](#) ()
- override void [BinDump](#) (System.IO.StreamWriter outs, System.String varName)
- virtual void [Copy](#) (System.String data)
- virtual void [Copy](#) (byte[] data, int startOffset, int length)
- override void [Copy](#) (byte[] data)
- override void [Copy](#) (byte data)
- virtual int [EncodeIdentifier](#) (int ident)
- virtual int [EncodeIntValue](#) (long ivalue)
- virtual int [EncodeLength](#) (int len)
- virtual int [EncodeTag](#) (Asn1Tag tag)
- virtual int [EncodeTagAndLength](#) (short tagClass, short tagForm, int tagIDCode, int len)
- virtual int [EncodeTagAndLength](#) (Asn1Tag tag, int len)
- virtual int [EncodeUnsignedBinaryNumber](#) (long ivalue)
- override System.IO.Stream [GetInputStream](#) ()
- override void [Reset](#) ()
- override System.String [ToString](#) ()
- virtual int [TrimBitString](#) (Asn1BitString bitstr)
- override void [Write](#) (System.IO.Stream outs)

### Protected Member Functions

- internal override void [CheckSize](#) (int bytesRequired)

### Properties

- virtual System.IO.MemoryStream [ByteArrayInputStream](#) [get]
- override byte[] [MsgCopy](#) [get]
- override int [MsgLength](#) [get]

#### 1.3.1 Detailed Description

This class handles the encoding of ASN.1 messages as specified in the Basic Encoding Rules (BER) as specified in the ITU-T X.690 standard. A reference to an object of this type is passed to each of the ASN.1 type encode methods involved in encoding a particular message type.

#### 1.3.2 Constructor & Destructor Documentation

##### 1.3.2.1 Asn1BerEncodeBuffer ()

This constructor creates a BER encode buffer object with the default size increment. Whenever the buffer becomes full, the buffer will be expanded by the sizeIncrement size.

### 1.3.2.2 Asn1BerEncodeBuffer (int sizeIncrement)

This constructor creates a BER encode buffer object with the given size increment. Whenever the buffer becomes full, the buffer will be expanded by the sizeIncrement size. This size should be large enough to prevent resizing in normal operation.

#### Parameters

*sizeIncrement* The initial size in bytes of an encode buffer. If the buffer becomes full, it will be expanded by the amount.

## 1.3.3 Member Function Documentation

### 1.3.3.1 virtual void BinDump () [virtual]

This method invokes an overloaded version of BinDump to dump the encoded message to standard output.

### 1.3.3.2 override void BinDump (System.IO.StreamWriter outs, System.String varName)

This method dumps the encoded message in a human-readable format showing tags and contents to the given output stream.

#### Parameters

*outs* StreamWriter where dump will be printed

*varName* Name of the Decoded ASN1 Type

### 1.3.3.3 internal override void CheckSize (int bytesRequired) [protected]

This method determines if the encode buffer can hold the requested number of bytes. If not, the buffer is expanded.

#### Parameters

*bytesRequired* Number of required bytes.

### 1.3.3.4 virtual void Copy (System.String data) [virtual]

This method copies a character string into the encode buffer

#### Parameters

*data* String to copy to the encode buffer

### 1.3.3.5 virtual void Copy (byte[] data, int startOffset, int length) [virtual]

This method copies multiple bytes to the encode buffer

#### Parameters

*data* Array of bytes to copy to the encode buffer

*startOffset* The byte offset in array at which to begin copy.

*length* Number of bytes to copy

### 1.3.3.6 **override void Copy (byte[] data)**

This method copies multiple bytes to the encode buffer

#### **Parameters**

*data* Array of bytes to copy to the encode buffer

### 1.3.3.7 **override void Copy (byte data)**

This method copies a single byte to the encode buffer.

#### **Parameters**

*data* The byte value to copy

### 1.3.3.8 **virtual int EncodeIdentifier (int ident) [virtual]**

This method encodes an ASN.1 identifier value such as the ones used in a tags or object identifiers.

#### **Parameters**

*ident* The identifier to be encoded.

#### **Returns**

Length of the encoded component in octets.

### 1.3.3.9 **virtual int EncodeIntValue (long ivalue) [virtual]**

This method encodes an ASN.1 integer value's contents according to the ASN.1 Basic Encoding Rules (BER)..

#### **Parameters**

*ivalue* Integer value to encode

#### **Returns**

Length of encoded component

### 1.3.3.10 **virtual int EncodeLength (int len) [virtual]**

This method encodes a length value.

#### **Parameters**

*len* The length to be encoded.

#### **Returns**

Length of encoded component

### 1.3.3.11 virtual int EncodeTag (Asn1Tag tag) [virtual]

This method encodes a tag value.

#### Parameters

*tag* The tag to be encoded.

#### Returns

Length of component or negative status value

### 1.3.3.12 virtual int EncodeTagAndLength (short tagClass, short tagForm, int tagIDCode, int len) [virtual]

This overloaded version of encodeTagAndLength allows tag value components to be specified instead of an Asn1Tag object

#### Parameters

*tagClass* The class of the tag to be encoded.

*tagForm* The form of the tag to be encoded.

*tagIDCode* The ID code of the tag to be encoded.

*len* The length to be encoded.

#### Returns

status value (see Asn1Status.java)

### 1.3.3.13 virtual int EncodeTagAndLength (Asn1Tag tag, int len) [virtual]

This method encodes both a tag and length value.

#### Parameters

*tag* The tag to be encoded.

*len* The length to be encoded.

#### Returns

Length of encoded component

### 1.3.3.14 virtual int EncodeUnsignedBinaryNumber (long ivalue) [virtual]

This method encodes an integer value as unsigned binary number according to the ASN.1 Basic Encoding Rules (BER)..

#### Parameters

*ivalue* Integer value to encode

#### Returns

Length of encoded component

### 1.3.3.15 override System.IO.Stream GetInputStream ()

This method returns an input stream representing the encoded message. This is a method defined as abstract in the base class that must be implemented by all derived classes. In this case, a byte array input stream is returned.

#### Returns

Input stream containing encoded message

### 1.3.3.16 override void Reset ()

This method resets the buffer to allow a new record to be encoded into it. Any previously encoded data is lost.

### 1.3.3.17 override System.String ToString ()

This method will return a string representation of the data in the encode buffer. The format is hex characters.

#### Returns

Stringified representation of the value

### 1.3.3.18 virtual int TrimBitString (Asn1BitString *bitstr*) [virtual]

This method will trim a BIT STRING for DER encoding by removing all zero trailing bits. The default implementation in [Asn1BerEncodeBuffer](#) does nothing. The overridden version in [Asn1DerEncodeBuffer](#) will trim the string.

<param name="bitstr"> ASN.1 BIT STRING object <return> Adjusted bit count </return>

Reimplemented in [Asn1DerEncodeBuffer](#).

### 1.3.3.19 override void Write (System.IO.Stream *outs*)

This method writes the encoded record to the given output stream.

#### Parameters

*outs* Output stream to which record is to be written

## 1.3.4 Property Documentation

### 1.3.4.1 virtual System.IO.MemoryStream ByteArrayInputStream [get]

This method returns a reference to a byte array input stream representing the encoded message. This is the preferred way to access the contents of the encoded message as it is the most efficient.

#### Returns

byte array input stream containing encoded message



#### **1.3.4.2 override byte [] MsgCopy [get]**

This method returns the encoded message in a byte array. This is less efficient than the `ByteArrayInputStream` property because the message contents must be copied to a newly created byte array.

#### **Returns**

byte array containing encoded message

#### **1.3.4.3 override int MsgLength [get]**

This method returns the length of the encoded message component.

#### **Returns**

length of encoded message component

## 1.4 Asn1BerInputStream Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1BerDecodeBuffer](#).

Inherited by [Asn1CerInputStream](#).

### Public Member Functions

- [Asn1BerInputStream](#) (System.IO.Stream istream)
- virtual int [Available](#) ()
- virtual void [Close](#) ()
- override void [Mark](#) ()
- virtual bool [MarkSupported](#) ()
- override void [Reset](#) ()
- override long [Skip](#) (long nbytes)

### 1.4.1 Detailed Description

This class handles the input stream for the decoding of ASN.1 messages as specified in the Basic Encoding Rules (BER) as documented in the ITU-T X.690 standard.

### 1.4.2 Constructor & Destructor Documentation

#### 1.4.2.1 Asn1BerInputStream (System.IO.Stream *istream*)

This constructor creates a BER input stream object that references an encoded ASN.1 message.

#### Parameters

*istream* Input stream containing an encoded ASN.1 message.

### 1.4.3 Member Function Documentation

#### 1.4.3.1 virtual int Available () [virtual]

Returns the number of bytes that can be read (or skipped over) from this input stream without blocking by the next caller of a method for this input stream. The next caller might be the same thread or or another thread.

#### Returns

the number of bytes that can be read from this input stream without blocking.

#### Exceptions

*System.SystemException* if an I/O error occurs.

#### 1.4.3.2 virtual void Close () [virtual]

Closes this input stream and releases any system resources associated with the stream.

#### Exceptions

*System.SystemException* if an I/O error occurs.

#### 1.4.3.3 override void Mark ()

This method is used to mark the current position in the input stream for retry processing or resetting the input stream position to current position.

#### 1.4.3.4 virtual bool MarkSupported () [virtual]

Tests if this input stream supports the seeking. This method is equivalent to C# `CanSeek` method of `System.IO.Stream`.

#### Returns

`true` if input stream supports seeking; Otherwise `false`.

#### 1.4.3.5 override void Reset ()

This method is used to reset the current position in the input stream back to the location of the last 'mark' call. It is equivalent to calling 'Stream.Position' to marked location.

#### 1.4.3.6 override long Skip (long nbytes)

This method will skip over the requested number of bytes in the input stream.

#### Parameters

*nbytes* Number of bytes to skip

#### Exceptions

*System.SystemException* if an I/O error occurs.

#### Returns

Skipped number of bytes

## 1.5 Asn1BerMessageDumpHandler Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1TaggedEventHandler](#).

### Public Member Functions

- [Asn1BerMessageDumpHandler](#) (System.IO.StreamWriter outs)
- [Asn1BerMessageDumpHandler](#) ()
- virtual void [Contents](#) (byte[ ] data)
- virtual void [EndElement](#) (Asn1Tag tag)
- virtual void [StartElement](#) (Asn1Tag tag, int len, byte[ ] tagLenBytes)

### 1.5.1 Detailed Description

This class implements the [Asn1EventHandler](#) interface to provide a formatted dump of a BER message to the given print output stream. An object of this type is used in conjunction with the [Asn1BerDecodeBuffer](#) *Parse* method to generically parse a BER message.

### 1.5.2 Constructor & Destructor Documentation

#### 1.5.2.1 Asn1BerMessageDumpHandler ()

The constructor will print the dump result on the standard output stream.

#### 1.5.2.2 Asn1BerMessageDumpHandler (System.IO.StreamWriter outs)

The constructor sets the StreamWriter object to which the formatted output should be written.

#### Parameters

*outs* Output stream for formatted data

### 1.5.3 Member Function Documentation

#### 1.5.3.1 virtual void Contents (byte[ ] data) [virtual]

This method is invoked after each contents field is parsed. It formats and prints the contents in a hex/ascii format.

#### Parameters

*data* Array containing the encoded contents bytes

Implements [Asn1TaggedEventHandler](#).

#### 1.5.3.2 virtual void EndElement (Asn1Tag tag) [virtual]

This method is invoked after parsing is complete on each tag/length/value (TLV) in the message.

## Parameters

*tag* Array containing the encoded contents bytes

Implements [Asn1TaggedEventHandler](#).

### 1.5.3.3 virtual void StartElement (Asn1Tag tag, int len, byte[] tagLenBytes) [virtual]

This method is invoked after each tag/length value is parsed in the message being dumped. It formats and prints the tag/length values.

## Parameters

*tag* Parsed tag value

*len* Parsed length value

*tagLenBytes* Array containing the encoded tag/length bytes

Implements [Asn1TaggedEventHandler](#).

## 1.6 Asn1BerOutputStream Class Reference

Inherited by [Asn1CerOutputStream](#).

### Public Member Functions

- [Asn1BerOutputStream](#) (System.IO.Stream os, int bufSize)
- [Asn1BerOutputStream](#) (System.IO.Stream os)
- virtual void [Encode](#) (Asn1Type type, bool explicitTagging)
- virtual void [EncodeBitString](#) (byte[] data, int numbits, bool explicitTagging, Asn1Tag tag)
- virtual void [EncodeBMPString](#) (System.String data, bool explicitTagging, Asn1Tag tag)
- virtual void [EncodeCharString](#) (System.String data, bool explicitTagging, Asn1Tag tag)
- virtual void [EncodeEOC](#) ()
- virtual void [EncodeIdentifier](#) (long ident)
- virtual void [EncodeIntValue](#) (long data, bool encodeLen)
- virtual void [EncodeLength](#) (int len)
- virtual void [EncodeOctetString](#) (byte[] data, bool explicitTagging, Asn1Tag tag)
- virtual void [EncodeTag](#) (short tagClass, short tagForm, int tagIDCode)
- virtual void [EncodeTag](#) (Asn1Tag tag)
- virtual void [EncodeTagAndIndefLen](#) (short tagClass, short tagForm, int tagIDCode)
- virtual void [EncodeTagAndIndefLen](#) (Asn1Tag tag)
- virtual void [EncodeTagAndLength](#) (Asn1Tag tag, int len)
- virtual void [EncodeUnivString](#) (int[] data, bool explicitTagging, Asn1Tag tag)
- virtual void [EncodeUnsignedBinaryNumber](#) (long data)

### 1.6.1 Detailed Description

This class implements the output stream to encode ASN.1 messages as specified in the Basic Encoding Rules (BER) as specified in the ITU-T X.690 standard. A reference to an object of this type is passed to each of the ASN.1 type encode methods involved in encoding a particular message type.

### 1.6.2 Constructor & Destructor Documentation

#### 1.6.2.1 Asn1BerOutputStream (System.IO.Stream os)

This constructor creates a buffered BER output stream object with default size of buffer. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

*os* The underlying System.IO.Stream object.

#### 1.6.2.2 Asn1BerOutputStream (System.IO.Stream os, int bufSize)

This constructor creates a buffered BER output stream object. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

*os* The underlying System.IO.Stream object.

*bufSize* The buffer size. If it is 0 then the output stream is used as unbuffered one.

## 1.6.3 Member Function Documentation

### 1.6.3.1 virtual void Encode (Asn1Type type, bool explicitTagging) [virtual]

This method encodes and writes to the stream ASN.1 types. The UNIVERSAL tag value and length is also encoded if explicit tagging is specified (the universal identifier must be provided by the caller).

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*type* The object to be written

*explicitTagging* Flag indicating explicit tagging should be done

Reimplemented in [Asn1CerOutputStream](#).

### 1.6.3.2 virtual void EncodeBitString (byte[] data, int numbits, bool explicitTagging, Asn1Tag tag) [virtual]

This method writes the given array of bytes as bit string value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*data* Byte array containing data to encode.

*numbits* Number of bits to encode

*explicitTagging* Flag indicating explicit tagging should be done

*tag* Universal tag to apply

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Reimplemented in [Asn1CerOutputStream](#).

### 1.6.3.3 virtual void EncodeBMPString (System.String data, bool explicitTagging, Asn1Tag tag) [virtual]

This method writes the given string as BMP string value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*data* String containing data to encode.

*explicitTagging* Flag indicating explicit tagging should be done

*tag* Universal tag to apply

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Reimplemented in [Asn1CerOutputStream](#).

#### **1.6.3.4 virtual void EncodeCharString (System.String *data*, bool *explicitTagging*, Asn1Tag *tag*) [virtual]**

This method encodes and writes to the stream an ASN.1 8-bit character string types including IA5String, PrintableString, NumericString, etc. The UNIVERSAL tag value and length is also encoded if explicit tagging is specified (the universal identifier must be provided by the caller).

Throws, exception thrown by the underlying System.IO.Stream object.

##### **Parameters**

*data* The string object to be written

*explicitTagging* Flag indicating explicit tagging should be done

*tag* Universal tag to apply

##### **Exceptions**

*Asn1Exception* Thrown, if operation is failed.

Reimplemented in [Asn1CerOutputStream](#).

#### **1.6.3.5 virtual void EncodeEOC () [virtual]**

This method encodes and writes an End-Of-Contents marker to the stream.

Throws, exception thrown by the underlying System.IO.Stream object.

#### **1.6.3.6 virtual void EncodeIdentifier (long *ident*) [virtual]**

This method encodes and writes to the stream an ASN.1 identifier value such as the ones used in a tags or object identifiers.

Throws, exception thrown by the underlying System.IO.Stream.

##### **Parameters**

*ident* The identifier to be encoded.

#### **1.6.3.7 virtual void EncodeIntValue (long *data*, bool *encodeLen*) [virtual]**

This method encodes and writes to the stream an ASN.1 integer value's contents according to the ASN.1 Basic Encoding Rules (BER).

Throws, exception thrown by the underlying System.IO.Stream object.

##### **Parameters**

*data* Integer value to encode.

*encodeLen* Flag indicating length determinant should be encoded before encoding integer value.



### 1.6.3.8 virtual void EncodeLength (int *len*) [virtual]

This method encodes and writes a length value to the stream.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*len* The length to be encoded.

### 1.6.3.9 virtual void EncodeOctetString (byte[] *data*, bool *explicitTagging*, Asn1Tag *tag*) [virtual]

This method writes the given array of bytes as octet string value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*data* Byte array containing data to encode.

*explicitTagging* Flag indicating explicit tagging should be done

*tag* Universal tag to apply

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Reimplemented in [Asn1CerOutputStream](#).

### 1.6.3.10 virtual void EncodeTag (short *tagClass*, short *tagForm*, int *tagIDCode*) [virtual]

This method encodes and writes a tag value to the stream.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*tagClass* The class of the tag to be encoded.

*tagForm* The form of the tag to be encoded.

*tagIDCode* The ID code of the tag to be encoded.

### 1.6.3.11 virtual void EncodeTag (Asn1Tag *tag*) [virtual]

This method encodes and writes a tag value to the stream.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*tag* The tag to be encoded.

### 1.6.3.12 virtual void EncodeTagAndIndefLen (short *tagClass*, short *tagForm*, int *tagIDCode*) [virtual]

This overloaded version of EncodeTagAndIndefLen allows tag value components to be specified instead of an Asn1Tag object.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*tagClass* The class of the tag to be encoded.

*tagForm* The form of the tag to be encoded.

*tagIDCode* The ID code of the tag to be encoded.

### 1.6.3.13 virtual void EncodeTagAndIndefLen (Asn1Tag *tag*) [virtual]

This method encodes and writes both a tag and an indefinite length indicator to the stream.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*tag* The tag to be encoded.

### 1.6.3.14 virtual void EncodeTagAndLength (Asn1Tag *tag*, int *len*) [virtual]

This method encodes and writes both a tag and length value to the stream.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*tag* The tag to be encoded.

*len* The length to be encoded.

### 1.6.3.15 virtual void EncodeUnivString (int[] *data*, bool *explicitTagging*, Asn1Tag *tag*) [virtual]

This method writes the given array of integers as UniversalString value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*data* Array containing data to encode.

*explicitTagging* Flag indicating explicit tagging should be done

*tag* Universal tag to apply

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Reimplemented in [Asn1CerOutputStream](#).

#### **1.6.3.16 virtual void EncodeUnsignedBinaryNumber (long *data*) [virtual]**

This method encodes an integer value as unsigned binary number according to the ASN.1 Basic Encoding Rules (BER).. and writes to the stream

Throws, exception thrown by the underlying System.IO.Stream object.

#### **Parameters**

*data* Integer value to encode.

## 1.7 Asn1CerInputStream Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1BerInputStream](#).

### Public Member Functions

- [Asn1CerInputStream](#) (System.IO.Stream *istream*)

### 1.7.1 Detailed Description

This class handles the input stream for the decoding of ASN.1 messages as specified in the Canonical Encoding Rules (CER) as documented in the ITU-T X.690 standard.

### 1.7.2 Constructor & Destructor Documentation

#### 1.7.2.1 Asn1CerInputStream (System.IO.Stream *istream*)

This constructor creates a CER input stream object that references an encoded ASN.1 message.

#### Parameters

*istream* Input stream containing an encoded ASN.1 message.

## 1.8 Asn1CerOutputStream Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1BerOutputStream](#).

### Public Member Functions

- [Asn1CerOutputStream](#) (System.IO.Stream os, int bufSize)
- [Asn1CerOutputStream](#) (System.IO.Stream os)
- override void [Encode](#) (Asn1Type type, bool explicitTagging)
- override void [EncodeBitString](#) (byte[] value, int numbits, bool explicitTagging, Asn1Tag tag)
- override void [EncodeBMPString](#) (System.String value, bool explicitTagging, Asn1Tag tag)
- override void [EncodeCharString](#) (System.String value, bool explicitTagging, Asn1Tag tag)
- override void [EncodeOctetString](#) (byte[] value, bool explicitTagging, Asn1Tag tag)
- virtual void [EncodeStringTag](#) (int nbytes, short tagClass, short tagForm, int tagIDCode)
- virtual void [EncodeStringTag](#) (int nbytes, Asn1Tag tag)
- override void [EncodeUnivString](#) (int[] value, bool explicitTagging, Asn1Tag tag)

### 1.8.1 Detailed Description

This class implements the output stream to encode ASN.1 messages as specified in the Canonical Encoding Rules (CER) as specified in the ITU-T X.690 standard. A reference to an object of this type is passed to each of the ASN.1 type encode methods involved in encoding a particular message type.

### 1.8.2 Constructor & Destructor Documentation

#### 1.8.2.1 Asn1CerOutputStream (System.IO.Stream os)

This constructor creates a buffered CER output stream object with default size of buffer. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

*os* The underlying System.IO.Stream object.

#### 1.8.2.2 Asn1CerOutputStream (System.IO.Stream os, int bufSize)

This constructor creates a buffered CER output stream object. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

*os* The underlying System.IO.Stream object.

*bufSize* The buffer size. If it is 0 then the output stream is used as unbuffered one.

## 1.8.3 Member Function Documentation

### 1.8.3.1 override void Encode (Asn1Type *type*, bool *explicitTagging*) [virtual]

This method encodes and writes to the stream ASN.1 types. The UNIVERSAL tag value and length is also encoded if explicit tagging is specified (the universal identifier must be provided by the caller).

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*type* The object to be written

*explicitTagging* Flag indicating explicit tagging should be done

Reimplemented from [Asn1BerOutputStream](#).

### 1.8.3.2 override void EncodeBitString (byte[] *value*, int *numbits*, bool *explicitTagging*, Asn1Tag *tag*) [virtual]

This method writes the given array of bytes as bit string value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*value* Byte array containing data to encode.

*numbits* Number of bits to encode

*explicitTagging* Flag indicating explicit tagging should be done

*tag* Universal tag to apply

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Reimplemented from [Asn1BerOutputStream](#).

### 1.8.3.3 override void EncodeBMPString (System.String *value*, bool *explicitTagging*, Asn1Tag *tag*) [virtual]

This method writes the given string as BMP string value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*value* String containing data to encode.

*explicitTagging* Flag indicating explicit tagging should be done

*tag* Universal tag to apply

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Reimplemented from [Asn1BerOutputStream](#).

#### 1.8.3.4 override void EncodeCharString (System.String value, bool explicitTagging, Asn1Tag tag) [virtual]

This method encodes and writes to the stream an ASN.1 8-bit character string types including IA5String, PrintableString, NumericString, etc. The UNIVERSAL tag value and length is also encoded if explicit tagging is specified (the universal identifier must be provided by the caller).

Throws, exception thrown by the underlying System.IO.Stream object.

##### Parameters

- value* The string object to be written
- explicitTagging* Flag indicating explicit tagging should be done
- tag* Universal tag to apply

##### Exceptions

- Asn1Exception* Thrown, if operation is failed.

Reimplemented from [Asn1BerOutputStream](#).

#### 1.8.3.5 override void EncodeOctetString (byte[] value, bool explicitTagging, Asn1Tag tag) [virtual]

This method writes the given array of bytes as octet string value.

Throws, exception thrown by the underlying System.IO.Stream object.

##### Parameters

- value* Byte array containing data to encode.
- explicitTagging* Flag indicating explicit tagging should be done
- tag* Universal tag to apply

##### Exceptions

- Asn1Exception* Thrown, if operation is failed.

Reimplemented from [Asn1BerOutputStream](#).

#### 1.8.3.6 virtual void EncodeStringTag (int nbytes, short tagClass, short tagForm, int tagIDCode) [virtual]

This method encodes and writes both a tag and length value to the stream.

Throws, exception thrown by the underlying System.IO.Stream object.

##### Parameters

- nbytes* The number of bytes in string to be encoded.
- tagClass* The class of the tag to be encoded.
- tagForm* The form of the tag to be encoded.
- tagIDCode* The ID code of the tag to be encoded.

### 1.8.3.7 virtual void EncodeStringTag (int *nbytes*, Asn1Tag *tag*) [virtual]

This method encodes and writes both a tag and length value to the stream.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*nbytes* The number of bytes in string to be encoded.

*tag* The tag to be encoded.

### 1.8.3.8 override void EncodeUnivString (int[] *value*, bool *explicitTagging*, Asn1Tag *tag*) [virtual]

This method writes the given array of integers as UniversalString value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*value* Array containing data to encode.

*explicitTagging* Flag indicating explicit tagging should be done

*tag* Universal tag to apply

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Reimplemented from [Asn1BerOutputStream](#).



## 1.9 Asn1DerDecodeBuffer Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1BerDecodeBuffer](#).

Inherited by [Asn1DerInputStream](#).

### Public Member Functions

- [Asn1DerDecodeBuffer](#) (System.IO.Stream *istream*)
- [Asn1DerDecodeBuffer](#) (byte[] *msgdata*)

### 1.9.1 Detailed Description

This class handles the decoding of ASN.1 messages as specified in the Distinguished Encoding Rules (DER) as documented in the ITU-T X.690 standard.

### 1.9.2 Constructor & Destructor Documentation

#### 1.9.2.1 Asn1DerDecodeBuffer (byte[] *msgdata*)

This constructor creates a DER Decode buffer object that references an encoded ASN.1 message.

#### Parameters

*msgdata* Byte array containing an encoded ASN.1 message.

#### 1.9.2.2 Asn1DerDecodeBuffer (System.IO.Stream *istream*)

This constructor creates a DER Decode buffer object that references an encoded ASN.1 message. In this case, the message is passed in using an System.IO.Stream object.

#### Parameters

*istream* Input stream containing an encoded ASN.1 message.

## 1.10 Asn1DerEncodeBuffer Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1BerEncodeBuffer](#).

### Public Member Functions

- [Asn1DerEncodeBuffer](#) (int *sizeIncrement*)
- [Asn1DerEncodeBuffer](#) ()
- override int [TrimBitString](#) (Asn1BitString *bitstr*)

#### 1.10.1 Detailed Description

This class handles the encoding of ASN.1 messages as specified in the Distinguished Encoding Rules (DER) as specified in the ITU-T X.690 standard.

#### 1.10.2 Constructor & Destructor Documentation

##### 1.10.2.1 Asn1DerEncodeBuffer ()

This constructor creates a DER encode buffer object with the default size increment. Whenever the buffer becomes full, the buffer will be expanded by the *sizeIncrement* size.

##### 1.10.2.2 Asn1DerEncodeBuffer (int *sizeIncrement*)

This constructor creates a DER encode buffer object with the given size increment. Whenever the buffer becomes full, the buffer will be expanded by the *sizeIncrement* size. This size should be large enough to prevent resizing in normal operation.

#### Parameters

*sizeIncrement* The initial size in bytes of an encode buffer. If the buffer becomes full, it will be expanded by this amount.

#### 1.10.3 Member Function Documentation

##### 1.10.3.1 override int TrimBitString (Asn1BitString *bitstr*) [virtual]

This method will trim a BIT STRING for DER encoding by removing all zero trailing bits.

<param name="bitstr"> ASN.1 BIT STRING object <return> Adjusted bit count </return>

Reimplemented from [Asn1BerEncodeBuffer](#).

## 1.11 Asn1DerInputStream Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1DerDecodeBuffer](#).

### Public Member Functions

- [Asn1DerInputStream](#) (System.IO.Stream istream)
- virtual int [Available](#) ()
- virtual void [Close](#) ()
- override void [Mark](#) ()
- virtual bool [MarkSupported](#) ()
- override void [Reset](#) ()
- override long [Skip](#) (long nbytes)

#### 1.11.1 Detailed Description

This class handles the input stream for the decoding of ASN.1 messages as specified in the Distinguished Encoding Rules (DER) as documented in the ITU-T X.690 standard.

#### 1.11.2 Constructor & Destructor Documentation

##### 1.11.2.1 [Asn1DerInputStream](#) (System.IO.Stream *istream*)

This constructor creates a DER decode buffer object that references an encoded ASN.1 message. In this case, the message is passed in using an System.IO.Stream object.

#### Parameters

*istream* Input stream containing an encoded ASN.1 message.

#### 1.11.3 Member Function Documentation

##### 1.11.3.1 virtual int [Available](#) () [**virtual**]

Returns the number of bytes that can be read (or skipped over) from this input stream without blocking by the next caller of a method for this input stream. The next caller might be the same thread or or another thread.

Throws, Exception thrown by C# System.IO.Stream for I/O error

#### Returns

the number of bytes that can be read from this input stream without blocking.

##### 1.11.3.2 virtual void [Close](#) () [**virtual**]

Closes this input stream and releases any system resources associated with the stream.

Throws, Exception thrown by C# System.IO.Stream for I/O error

### 1.11.3.3 **override void Mark ()**

This method is used to mark the current position in the input stream for retry processing or resetting the input stream position to current position.

### 1.11.3.4 **virtual bool MarkSupported () [virtual]**

Tests if this input stream supports the seeking. This method is equivalent to C# `CanSeek` method of `System.IO.Stream`.

#### **Returns**

`true` if input stream supports seeking; Otherwise `false`.

### 1.11.3.5 **override void Reset ()**

This method is used to reset the current position in the input stream back to the location of the last 'mark' call. It is equivalent to calling 'Stream.Position' to marked location.

### 1.11.3.6 **override long Skip (long *nbytes*)**

This method will skip over the requested number of bytes in the input stream.

#### **Parameters**

*nbytes* Number of bytes to skip

#### **Returns**

Skipped number of bytes

## 1.12 Asn1NotInSetException Class Reference

### Public Member Functions

- [Asn1NotInSetException](#) ([Asn1BerDecodeBuffer](#) buffer, [Asn1Tag](#) tag)

#### 1.12.1 Detailed Description

This class defines the 'ASN.1 element not in set' exception that is thrown from BER/DER methods when an element is parsed within the context of a SET that does not belong to the set.

#### 1.12.2 Constructor & Destructor Documentation

##### 1.12.2.1 Asn1NotInSetException ([Asn1BerDecodeBuffer](#) *buffer*, [Asn1Tag](#) *tag*)

This constructor creates an exception object with a textual message describing the tag of the duplicate element.

#### Parameters

*buffer* BER decode buffer object reference

*tag* Tag value of element that is not in the set

## 1.13 Asn1PerBitField Class Reference

### Public Member Functions

- [Asn1PerBitField](#) (System.String name, int bitOffset, int bitCount)
- virtual void [SetBitCountAndOffset](#) (int count, int offset)

### Properties

- virtual int [BitCount](#) [get, set]
- virtual int [BitOffset](#) [get, set]
- virtual System.String [Name](#) [get]

### 1.13.1 Detailed Description

This class is used to store information on an individual bit field within a PER message. The information can be used to print a bit trace of the components of a message. It is used in conjunction with the [Asn1PerBitFieldList](#) class to map all bits in a message.

### 1.13.2 Constructor & Destructor Documentation

#### 1.13.2.1 Asn1PerBitField (System.String name, int bitOffset, int bitCount)

This constructor initializes all of the variables used to track the bit fields.

#### Parameters

- name* Name of the bit field.
- bitOffset* Offset within buffer to the bit field
- bitCount* Number of bits in the bit field

### 1.13.3 Member Function Documentation

#### 1.13.3.1 virtual void SetBitCountAndOffset (int count, int offset) [virtual]

This method sets the count of bits in the bit field and the offset to the bit field in the message buffer.

#### Parameters

- count* Number of bits in the bit field
- offset* Offset within buffer to the bit field

### 1.13.4 Property Documentation

#### 1.13.4.1 virtual int BitCount [get, set]

Gets and Sets the number of bits in the bit field.

**Value:** Number of bits.

#### **1.13.4.2 virtual int BitOffset [get, set]**

Gets and Sets the offset to the bit field in the message buffer.

**Value:** Offset of the bitfield

#### **1.13.4.3 virtual System.String Name [get]**

This method returns the name assigned to the bit field.

**Value:** Bitfield name

## 1.14 Asn1PerBitFieldList Class Reference

### Public Member Functions

- virtual void [AddElemName](#) (System.String name, int arrayx)
- virtual System.Collections.IEnumerator [Iterator](#) ()
- virtual [Asn1PerBitField NewBitField](#) (System.String nameSuffix, int bitOffset, int bitCount)
- virtual void [RemoveLastElemName](#) ()
- virtual void [Reset](#) ()

### Properties

- virtual int [BitOffset](#) [set]
- virtual [Asn1PerBitField CurrBitField](#) [get]

#### 1.14.1 Detailed Description

This class is used to map all of the bit fields in a PER message. After encoding or decoding is complete, this object can be used to provide a formatted printout of all of the message fields.

#### 1.14.2 Member Function Documentation

##### 1.14.2.1 virtual void AddElemName (System.String name, int arrayx) [virtual]

This method adds an element name to the current fully qualified name. The fully qualified name is a string of name components separated by dots (ex. a.b.c).

##### Parameters

*name* Name component to append to string

*arrayx* Array index if named item is an element in an array (set to -1 otherwise)

##### 1.14.2.2 virtual System.Collections.IEnumerator Iterator () [virtual]

This method returns an iterator to the encapsulated bit field linked list object.

##### Returns

System.Collections.IEnumerator value of this list

##### 1.14.2.3 virtual Asn1PerBitField NewBitField (System.String nameSuffix, int bitOffset, int bitCount) [virtual]

This method creates a new bit field object with the given properties and appends it to the bit field list. Also sets as current bit field.

##### Parameters

*nameSuffix* Suffix to add to fully qualified name for this field (for example, 'length')



*bitOffset* Offset to the start of this field in bits from the beginning of the encode buffer.

*bitCount* Number of bits in the field.

## Returns

Created bit field

### 1.14.2.4 virtual void RemoveLastElemName () [virtual]

This method removes the last element name in the current fully qualified name string. For example, if the current string is 'a.b.c', it will be 'a.b' after calling this method.

### 1.14.2.5 virtual void Reset () [virtual]

This method resets the object.

## 1.14.3 Property Documentation

### 1.14.3.1 virtual int BitOffset [set]

Set the current bit offset in the bit field.

**Value:** The bit offset

### 1.14.3.2 virtual Asn1PerBitField CurrBitField [get]

Gets a reference to the current bit field object (i.e. the one that was last created).

**Value:** Current bit field

## 1.15 Asn1PerBitFieldPrinter Class Reference

### Public Member Functions

- [Asn1PerBitFieldPrinter](#) ([Asn1PerMessageBuffer](#) perMessageBuffer, System.IO.Stream encodedMessage)
- virtual void [Print](#) (System.IO.StreamWriter outs, System.String varName)

### Protected Attributes

- internal int [mBitMask](#)
- internal int [mByteIndex](#)
- internal int [mCurrOctet](#)
- internal System.IO.Stream [mEncodedMessage](#)
- internal int [mFmtBitCharIdx](#)
- internal System.Text.StringBuilder [mFormatBuffer](#)
- internal [Asn1PerMessageBuffer](#) [mPerMessageBuffer](#)

#### 1.15.1 Detailed Description

This class is used to obtain a formatted printout of the bit fields that make up a PER encoded message.

#### 1.15.2 Constructor & Destructor Documentation

##### 1.15.2.1 [Asn1PerBitFieldPrinter](#) ([Asn1PerMessageBuffer](#) *perMessageBuffer*, System.IO.Stream *encodedMessage*)

Constructor

##### Parameters

*perMessageBuffer* PER encode or decode message buffer  
*encodedMessage* Input stream of encoded message

#### 1.15.3 Member Function Documentation

##### 1.15.3.1 virtual void [Print](#) (System.IO.StreamWriter *outs*, System.String *varName*) [**virtual**]

This method iterates through and prints all of the bit fields in a PER encoded message. Bit tracing needs to have been enabled in the buffer via the 'perTraceEnable' method prior to encoding or decoding the message.

##### Parameters

*outs* Print stream  
*varName* Variable name. This will be printed before all fields (for example, <varName> .field1, etc.)

#### 1.15.4 Member Data Documentation

##### 1.15.4.1 internal int [mBitMask](#) [**protected**]

This variable holds the mask for current bit

**1.15.4.2 internal int mByteIndex [protected]**

This variable holds the byte index

**1.15.4.3 internal int mCurrOctet [protected]**

This variable holds the current byte

**1.15.4.4 internal System.IO.Stream mEncodedMessage [protected]**

This variable holds the input stream

**1.15.4.5 internal int mFmtBitCharIdx [protected]**

This variable holds the index for formatted information

**1.15.4.6 internal System.Text.StringBuilder mFormatBuffer [protected]**

**Initial value:**

```
new System.Text.StringBuilder()
```

This variable holds the formatted information of current byte

**1.15.4.7 internal Asn1PerMessageBuffer mPerMessageBuffer [protected]**

This variable holds the PER encode or decode message buffer

## 1.16 Asn1PerDecodeBuffer Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1PerMessageBuffer](#).

Inherited by [Asn1PerInputStream](#).

### Public Member Functions

- [Asn1PerDecodeBuffer](#) (System.IO.Stream istream, bool aligned)
- [Asn1PerDecodeBuffer](#) (byte[ ] msgdata, bool aligned)
- virtual void [BinDump](#) (System.IO.StreamWriter outs, System.String varName)
- virtual void [BinDump](#) (System.String varName)
- virtual void [ByteAlign](#) ()
- virtual bool [DecodeBit](#) ()
- virtual bool [DecodeBit](#) (System.String ident)
- virtual int [DecodeBitsToInt](#) (int nbits)
- virtual int [DecodeBitsToInt](#) (int nbits, System.String ident)
- virtual long [DecodeBitsToLong](#) (int nbits)
- virtual long [DecodeBitsToLong](#) (int nbits, System.String ident)
- virtual void [DecodeBitsToOctetArray](#) (byte[ ] data, int offset, int nbits)
- virtual void [DecodeBitsToOctetArray](#) (byte[ ] data, int offset, int bitOffset, int nbits, System.String ident)
- virtual void [DecodeBitsToOctetArray](#) (byte[ ] data, int offset, int nbits, System.String ident)
- virtual void [DecodeCharString](#) (int nchars, int abpc, int ubpc, Asn1CharSet charSet, System.Text.StringBuilder sbuf)
- virtual long [DecodeConsWholeNumber](#) (long rangeValue)
- virtual long [DecodeConsWholeNumber](#) (long rangeValue, System.String ident)
- virtual long [DecodeExtLength](#) ()
- virtual long [DecodeInt](#) (int nocts, bool signExtend)
- virtual long [DecodeInt](#) (int nocts, bool signExtend, System.String ident)
- virtual long [DecodeLength](#) (long lower, long upper)
- virtual long [DecodeLength](#) ()
- virtual int [DecodeSmallLength](#) ()
- virtual int [DecodeSmallNonNegWholeNumber](#) ()
- virtual long [DecodeUnconsLength](#) ()
- virtual bool [IsAligned](#) ()
- virtual void [MoveBitCursor](#) (long offset)
- override int [ReadByte](#) ()
- virtual void [SetAligned](#) (bool data)
- override void [SetInputStream](#) (byte[ ] msgdata, int offset, int length)
- void [SetSizeConstraint](#) (long lower, long upper)
- void [SetSizeConstraintExt](#) (long lower, long upper, long extLower, long extUpper)

### Static Public Member Functions

- static [Asn1PerDecodeBuffer SetBuffer](#) ([Asn1PerDecodeBuffer](#) buffer, byte[ ] msgdata, bool aligned)

### Protected Attributes

- internal [Asn1PerTraceHandler mTraceHandler](#)

## Properties

- virtual long [BitOffset](#) [get]
- virtual int [MsgBitCnt](#) [get]
- virtual [Asn1PerTraceHandler](#) [TraceHandler](#) [get]

### 1.16.1 Detailed Description

This class handles the decoding of ASN.1 messages as specified in the Packed Encoding Rules (PER) ITU-T X.691 standard.

### 1.16.2 Constructor & Destructor Documentation

#### 1.16.2.1 [Asn1PerDecodeBuffer](#) ([byte\[\] msgdata](#), [bool aligned](#))

This constructor creates a PER Decode buffer object that references an encoded ASN.1 message.

##### Parameters

*msgdata* Byte array containing an encoded ASN.1 message.

*aligned* `true` for specifying PER aligned; otherwise `false` for unaligned encoding.

#### 1.16.2.2 [Asn1PerDecodeBuffer](#) ([System.IO.Stream istream](#), [bool aligned](#))

This constructor creates a PER Decode buffer object that references an encoded ASN.1 message. In this case, the message is passed in using an [System.IO.Stream](#) object.

##### Parameters

*istream* Input stream containing an encoded ASN.1 message.

*aligned* Boolean specifying PER aligned or unaligned encoding.

### 1.16.3 Member Function Documentation

#### 1.16.3.1 [virtual void BinDump](#) ([System.IO.StreamWriter outs](#), [System.String varName](#)) [[virtual](#)]

This method dumps the encoded message in a human-readable format showing a bit trace of all fields to the given output stream.

##### Parameters

*outs* StreamWriter object to which output should be written

*varName* Name of top-level message object variable

#### 1.16.3.2 [virtual void BinDump](#) ([System.String varName](#)) [[virtual](#)]

This method invokes an overloaded version of [BinDump](#) to dump the encoded message to standard output.

##### Parameters

*varName* Name of top-level message object variable

### 1.16.3.3 virtual void ByteAlign () [virtual]

This methods byte-aligns the buffer.

Implements [Asn1PerMessageBuffer](#).

### 1.16.3.4 virtual bool DecodeBit () [virtual]

This method decodes a single bit value. The `ident` argument which is used for tracing is defaulted to 'value'.

#### Returns

Boolean value of bit that was decoded.

### 1.16.3.5 virtual bool DecodeBit (System.String *ident*) [virtual]

This method decodes a single bit value.

#### Parameters

*ident* Bit field identifier name for tracing.

#### Returns

Boolean value of bit that was decoded.

### 1.16.3.6 virtual int DecodeBitsToInt (int *nbits*) [virtual]

This method decodes bits from the input stream into a standard integer value. Up to 32 bits can be decoded. The bits are placed in the least-significant bytes of the integer. The `ident` argument which is used for tracing is defaulted to 'value'.

#### Returns

Integer value containing decoded bits

#### Parameters

*nbits* Number of bits to Decode

### 1.16.3.7 virtual int DecodeBitsToInt (int *nbits*, System.String *ident*) [virtual]

This method decodes bits from the input stream into a standard integer value. Up to 32 bits can be decoded. The bits are placed in the least-significant bytes of the integer.

#### Parameters

*nbits* Number of bits to Decode

*ident* Bit field identifier name for tracing.

#### Returns

Integer value containing decoded bits

### 1.16.3.8 virtual long DecodeBitsToLong (int *nbits*) [virtual]

This method decodes bits from the input stream into a long integer value. Up to 64 bits can be decoded. The bits are placed in the least-significant bytes of the long integer. The `ident` argument which is used for tracing is defaulted to 'value'.

#### Parameters

*nbits* Number of bits to Decode

#### Returns

Long integer value containing decoded bits

### 1.16.3.9 virtual long DecodeBitsToLong (int *nbits*, System.String *ident*) [virtual]

This method decodes bits from the input stream into a long integer value. Up to 64 bits can be decoded. The bits are placed in the least-significant bytes of the long integer.

#### Returns

Long integer value containing decoded bits

#### Parameters

*nbits* Number of bits to Decode

*ident* Bit field identifier name for tracing.

### 1.16.3.10 virtual void DecodeBitsToOctetArray (byte[] *data*, int *offset*, int *nbits*) [virtual]

This method decodes bits from the input stream into an array of octets. The user is expected to have provided an array large enough to hold the number of bits requested to be decoded. The `ident` argument which is used for tracing is defaulted to 'value'.

#### Parameters

*data* Octet array for decoded data

*offset* Starting byte offset into array

*nbits* Number of bits to Decode

### 1.16.3.11 virtual void DecodeBitsToOctetArray (byte[] *data*, int *offset*, int *bitOffset*, int *nbits*, System.String *ident*) [virtual]

This method decodes bits from the input stream into an array of octets. The user is expected to have provided an array large enough to hold the number of bits requested to be decoded.

The first bit is decoded into the given offset byte at the MSB if `bitOffset == 0`, and at the LSB if `bitOffset == 7`.

#### Parameters

*data* Octet array for decoded data

*offset* Starting byte offset into array

*bitOffset* Where in first byte the first bit goes

*nbits* Number of bits to Decode

*ident* Bit field identifier name for tracing.

**1.16.3.12 virtual void DecodeBitsToOctetArray (byte[] data, int offset, int nbits, System.String ident) [virtual]**

This method decodes bits from the input stream into an array of octets. The user is expected to have provided an array large enough to hold the number of bits requested to be decoded.

**Parameters**

*data* Octet array for decoded data

*offset* Starting byte offset into array

*nbits* Number of bits to Decode

*ident* Bit field identifier name for tracing.

**1.16.3.13 virtual void DecodeCharString (int nchars, int abpc, int ubpc, Asn1CharSet charSet, System.Text.StringBuilder sbuf) [virtual]**

This method decodes the contents of a known-multiplier character string. This version of the method assumes a permitted alphabet constraint is in place.

**Parameters**

*nchars* Number of characters

*abpc* Number of bits per character (aligned)

*ubpc* Number of bits per character (unaligned)

*charSet* Object representing the permitted alphabet constraint character set (optional)

*sbuf* String buffer to receive decoded result

**1.16.3.14 virtual long DecodeConsWholeNumber (long rangeValue) [virtual]**

This method implements the rules to Decode a constrained whole number as specified in section 10.5 of the X.691 standard. The *ident* argument which is used for tracing is defaulted to 'value'.

**Parameters**

*rangeValue* lower - upper + 1

**Returns**

Decoded adjusted value = value - lower range endpoint value



### 1.16.3.15 virtual long DecodeConsWholeNumber (long *rangeValue*, System.String *ident*) [virtual]

This method implements the rules to Decode a constrained whole number as specified in section 10.5 of the X.691 standard.

#### Parameters

*rangeValue* upper - lower + 1. Treated as unsigned, with 0 representing  $2^{64}$ .

*ident* Tracing identifier

#### Returns

Decoded adjusted value = value - lower range endpoint value

### 1.16.3.16 virtual long DecodeExtLength () [virtual]

This method decodes an extension length value. Note that the decoded length is not what is returned. The bit offset to the start of the next element within the Decode buffer is returned.

#### Returns

Bit offset to next element in buffer

### 1.16.3.17 virtual long DecodeInt (int *nocts*, bool *signExtend*) [virtual]

This method implements the rules to Decode an unconstrained integer value. The *ident* argument which is used for tracing is defaulted to 'value'.

#### Returns

Decoded long integer value

#### Parameters

*nocts* Number of octets to Decode

*signExtend* Sign extend resulting value

### 1.16.3.18 virtual long DecodeInt (int *nocts*, bool *signExtend*, System.String *ident*) [virtual]

This method implements the rules to Decode an unconstrained integer value.

#### Returns

Decoded long integer value

#### Parameters

*nocts* Number of octets to Decode

*signExtend* Sign extend resulting value

*ident* Tracing identifier

### **1.16.3.19 virtual long DecodeLength (long *lower*, long *upper*) [virtual]**

This method decodes a constrained length determinant value.

#### **Parameters**

*lower* Lower bound (inclusive) of length value range

*upper* Upper bound (inclusive) of length value range

#### **Returns**

Decoded length value

### **1.16.3.20 virtual long DecodeLength () [virtual]**

This method decodes either a constrained or unconstrained length depending on whether a size constraint object is set in this object.

#### **Returns**

Decoded length value.

### **1.16.3.21 virtual int DecodeSmallLength () [virtual]**

This method implements the rules to Decode a normally small length as specified in section 11.9 of the X.691 standard.

#### **Returns**

Decoded int value

### **1.16.3.22 virtual int DecodeSmallNonNegWholeNumber () [virtual]**

This method implements the rules to Decode a small non-negative whole number as specified in section 10.6 of the X.691 standard.

#### **Returns**

Decoded int value

### **1.16.3.23 virtual long DecodeUnconsLength () [virtual]**

This method decodes a general (unconstrained) length determinant value as described in section 11.9 of the 2008 X.691 standard. The maximum value that will be returned is 64K which is the largest length fragment size defined for PER. If a value of 16K or larger is returned, the user must repeat this call to fully Decode the fragmented contents.

#### **Returns**

Decoded length value. If the returned value is  $\geq 16k$ , this indicates a fragmented length was decoded. The user must call this method again after the data fragment is decoded to get the next fragment length.

#### 1.16.3.24 virtual bool IsAligned () [virtual]

This method tests if PER alignment is turned on or off.

##### Returns

`true` for PER aligned encoding or `false` for unaligned encoding.

Implements [Asn1PerMessageBuffer](#).

#### 1.16.3.25 virtual void MoveBitCursor (long offset) [virtual]

This method moves the bit cursor to the given offset.

##### Parameters

*offset* Absolute bit offset value

#### 1.16.3.26 override int ReadByte ()

This method returns the next available 8-bit value from the input stream. It is implemented differently for BER/DER and PER to take into account odd alignments in PER.

##### Returns

Next 8-bit byte value from input stream

#### 1.16.3.27 virtual void SetAligned (bool data) [virtual]

This method is used to turn PER aligned encoding on or off.

##### Parameters

*data* `true` for PER aligned encoding or `false` for unaligned encoding.

#### 1.16.3.28 static Asn1PerDecodeBuffer SetBuffer (Asn1PerDecodeBuffer buffer, byte[] msgdata, bool aligned) [static]

This method will create or reinitialize a PER Decode message buffer object to read data from the given byte array. If the existing buffer reference is null, a new buffer will be created; otherwise, the existing buffer will be reused.

##### Parameters

*buffer* Existing message buffer object

*msgdata* Byte array containing message data

*aligned* `true` specifying PER aligned or `false` for unaligned encoding.

##### Returns

[Asn1PerDecodeBuffer](#) to read data from the given byte array

### 1.16.3.29 **override void SetInputStream (byte[] msgdata, int offset, int length)**

This method will set the input stream from which data is read. This version of the method allows a byte array containing encoded data to be specified.

#### **Parameters**

*msgdata* Byte array containing encoded message data

*offset* Starting offset of data in the byte array

*length* Length (in bytes) of the encoded data

### 1.16.3.30 **void SetSizeConstraint (long lower, long upper)**

This method is used to set a size constraint within the buffer object. The constraint will only be set if an existing constraint is not already in place (i.e. if the existing reference is not null). This is used for length decoding of SEQUENCE OF objects to pass constraints applied to referenced objects to the base object.

### 1.16.3.31 **void SetSizeConstraintExt (long lower, long upper, long extLower, long extUpper)**

This method is used to set an extensible size constraint in the buffer object. The constraint will only be set if an existing constraint is not already in place (i.e. if the existing reference is not null). This is used for length encoding of SEQUENCE OF objects to pass constraints applied to referenced objects to the base object.

## 1.16.4 **Member Data Documentation**

### 1.16.4.1 **internal Asn1PerTraceHandler mTraceHandler [protected]**

Variable holds the PER message trace handler

## 1.16.5 **Property Documentation**

### 1.16.5.1 **virtual long BitOffset [get]**

Gets the absolute offset to the current bit in the Decode buffer.

**Value:** offset to current bit in Decode buffer

### 1.16.5.2 **virtual int MsgBitCnt [get]**

Gets the number of bits in the encoded PER message.

**Value:** count of bits in encoded message

Implements [Asn1PerMessageBuffer](#).

### 1.16.5.3 **virtual Asn1PerTraceHandler TraceHandler [get]**

Gets a reference to the internal trace handler object used to trace the bit fields within a PER message.

**Value:** [Asn1PerTraceHandler](#) object

Implements [Asn1PerMessageBuffer](#).

## 1.17 Asn1PerDecodeTraceHandler Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1PerTraceHandler](#).

### Public Member Functions

- [Asn1PerDecodeTraceHandler](#) ([Asn1PerDecodeBuffer](#) messageBuffer)
- override void [Enable](#) ()
- override void [Print](#) (System.IO.StreamWriter outs, System.String varName)
- override void [Reset](#) ()

#### 1.17.1 Detailed Description

This is a utility class for handling the collection and printing of PER bit field trace information. An object of the class is present within both the [Asn1PerEncodeBuffer](#) and [Asn1PerDecodeBuffer](#) classes. It is accessed using the 'TraceHandler' property from within objects of these classes.

#### 1.17.2 Constructor & Destructor Documentation

##### 1.17.2.1 Asn1PerDecodeTraceHandler ([Asn1PerDecodeBuffer](#) *messageBuffer*)

This constructor initializes the internal trace handler member variables.

##### Parameters

*messageBuffer* PER decode message buffer object reference

#### 1.17.3 Member Function Documentation

##### 1.17.3.1 override void [Enable](#) () [virtual]

This method is used to turn PER bit tracing on

Implements [Asn1PerTraceHandler](#).

##### 1.17.3.2 override void [Print](#) (System.IO.StreamWriter *outs*, System.String *varName*) [virtual]

This method prints the trace to the given output stream in a default format.

##### Parameters

*outs* Print stream to which output is to be written.

*varName* Name of the object variable being printed.

Implements [Asn1PerTraceHandler](#).

##### 1.17.3.3 override void [Reset](#) () [virtual]

This method resets the trace bit field list.

Implements [Asn1PerTraceHandler](#).

## 1.18 Asn1PerEncodeBuffer Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1PerMessageBuffer](#).

### Public Member Functions

- [Asn1PerEncodeBuffer](#) (bool aligned, int sizeIncrement)
- [Asn1PerEncodeBuffer](#) (bool aligned)
- override void [BinDump](#) (System.IO.StreamWriter outs, System.String varName)
- virtual void [ByteAlign](#) ()
- override void [Copy](#) (byte[] value)
- override void [Copy](#) (byte value)
- virtual void [EncodeBit](#) (bool value)
- virtual void [EncodeBit](#) (bool value, System.String ident)
- virtual void [EncodeBits](#) (byte[] value, int offset, int nbits)
- virtual void [EncodeBits](#) (byte[] value, int offset, int bitOffset, int nbits, System.String ident)
- virtual void [EncodeBits](#) (byte[] value, int offset, int nbits, System.String ident)
- virtual void [EncodeBits](#) (byte value, int nbits)
- virtual void [EncodeCharString](#) (System.String value, int nchars, int offset, int abpc, int ubpc, Asn1CharSet charSet)
- virtual void [EncodeConsWholeNumber](#) (long adjustedValue, long rangeValue)
- virtual void [EncodeConsWholeNumber](#) (long adjustedValue, long rangeValue, System.String ident)
- virtual void [EncodeInt](#) (long value, bool encodeLen, bool signExtend)
- virtual void [EncodeInt](#) (long value, bool encodeLen, bool signExtend, System.String ident)
- virtual void [EncodeInt](#) (long value, int nbits)
- virtual void [EncodeInt](#) (long value, int nbits, System.String ident)
- virtual void [EncodeLength](#) (long value, long lower, long upper)
- virtual long [EncodeLength](#) (long value)
- virtual void [EncodeLengthEOM](#) (long value)
- virtual void [EncodeOctetString](#) (byte[] value, int offset, int nbytes)
- virtual void [EncodeOIDLengthAndValue](#) (int[] value)
- virtual void [EncodeOpenType](#) ([Asn1PerEncodeBuffer](#) buffer, System.String elemName)
- virtual void [EncodeOpenType](#) (byte[] value, int offset, int nbytes)
- virtual void [EncodeRelOIDLengthAndValue](#) (int[] value)
- virtual void [EncodeSmallLength](#) (int value)
- virtual void [EncodeSmallNonNegWholeNumber](#) (int value)
- virtual long [EncodeUnconsLength](#) (long value)
- override System.IO.Stream [GetInputStream](#) ()
- override void [HexDump](#) ()
- virtual bool [IsAligned](#) ()
- override void [Reset](#) ()
- virtual void [ReverseBytes](#) (int offset, int nbytes)
- virtual void [SetAligned](#) (bool value)
- void [SetSizeConstraint](#) (long lower, long upper)
- void [SetSizeConstraintExt](#) (long lower, long upper, long extLower, long extUpper)
- override System.String [ToString](#) ()
- override void [Write](#) (System.IO.Stream outs)

## Protected Member Functions

- internal override void [CheckSize](#) (int bytesRequired)

## Protected Attributes

- internal [Asn1PerTraceHandler](#) [mTraceHandler](#)

## Properties

- virtual byte[] [Buffer](#) [get]
- virtual System.IO.MemoryStream [ByteArrayInputStream](#) [get]
- virtual int [ByteIndex](#) [get]
- virtual int [MsgBitCnt](#) [get]
- virtual int [MsgByteCnt](#) [get]
- override byte[] [MsgCopy](#) [get]
- override int [MsgLength](#) [get]
- virtual [Asn1PerTraceHandler](#) [TraceHandler](#) [get]

### 1.18.1 Detailed Description

This class handles the encoding of ASN.1 messages as specified in the Packed Encoding Rules (PER) ITU-T X.691 standard.

### 1.18.2 Constructor & Destructor Documentation

#### 1.18.2.1 [Asn1PerEncodeBuffer](#) (bool *aligned*)

This constructor creates a PER encode buffer object with the default size increment. Whenever the buffer becomes full, the buffer will be expanded by the `sizeIncrement` size.

#### Parameters

*aligned* `true` for PER aligned or `false` for PER unaligned encoding.

#### 1.18.2.2 [Asn1PerEncodeBuffer](#) (bool *aligned*, int *sizeIncrement*)

This constructor creates a PER encode buffer object with the given size increment. Whenever the buffer becomes full, the buffer will be expanded by the `sizeIncrement` size. This size should be large enough to prevent resizing in normal operation.

#### Parameters

*aligned* `true` for PER aligned or `false` for PER unaligned encoding.

*sizeIncrement* The initial size in bytes of an encode buffer. If the buffer becomes full, it will be expanded by the amount.

### 1.18.3 Member Function Documentation

#### 1.18.3.1 override void BinDump (System.IO.StreamWriter *outs*, System.String *varName*)

This method dumps the encoded message in a human-readable format showing a bit trace of all fields to the given print output stream.

##### Parameters

*outs* StreamWriter object to which output should be written  
*varName* Name of top-level message object variable

#### 1.18.3.2 virtual void ByteAlign () [virtual]

This methods byte-aligns the buffer.

Implements [Asn1PerMessageBuffer](#).

#### 1.18.3.3 internal override void CheckSize (int *bytesRequired*) [protected]

This method determines if the encode buffer can hold the requested number of bytes. If not, the buffer is expanded.

##### Parameters

*bytesRequired* Number of required bytes.

#### 1.18.3.4 override void Copy (byte[] *value*)

This method copies multiple bytes to the encode buffer

##### Parameters

*value* Array of bytes to copy to the encode buffer

#### 1.18.3.5 override void Copy (byte *value*)

This method is used to copy a single byte to the encode buffer.

##### Parameters

*value* The byte value to copy

#### 1.18.3.6 virtual void EncodeBit (bool *value*) [virtual]

This method encodes a single bit value. The *ident* argument which is used for tracing is defaulted to 'value'.

##### Parameters

*value* Boolean value of bit to be encoded.



### 1.18.3.7 virtual void EncodeBit (bool *value*, System.String *ident*) [virtual]

This method encodes a single bit value.

#### Parameters

*value* Boolean value of bit to be encoded.

*ident* Bit field identifier name for tracing.

### 1.18.3.8 virtual void EncodeBits (byte[] *value*, int *offset*, int *nbits*) [virtual]

This method encodes bit values from an array of octets. The *ident* argument which is used for tracing is defaulted to 'value'.

#### Parameters

*value* Octet array containing bits to be encoded

*offset* Starting byte offset in value

*nbits* Number of bits to encode

### 1.18.3.9 virtual void EncodeBits (byte[] *value*, int *offset*, int *bitOffset*, int *nbits*, System.String *ident*) [virtual]

This method encodes bit values from an array of octets.

#### Parameters

*value* Octet array containing bits to be encoded

*offset* Starting byte offset in value

*bitOffset* Starting bit offset in first byte. For example, passing 0 would begin encoding with the most significant bit, while passing 7 would begin encoding with the least significant bit.

*nbits* Number of bits to encode

*ident* Bit field identifier name for tracing.

### 1.18.3.10 virtual void EncodeBits (byte[] *value*, int *offset*, int *nbits*, System.String *ident*) [virtual]

This method encodes bit values from an array of octets.

#### Parameters

*value* Octet array containing bits to be encoded

*offset* Starting byte offset in value

*nbits* Number of bits to encode

*ident* Bit field identifier name for tracing.

### 1.18.3.11 virtual void EncodeBits (byte *value*, int *nbits*) [virtual]

This method encodes bit values from an octet. The most significant bits from the octet are encoded.

#### Parameters

*value* Octet containing bits to be encoded

*nbits* Number of bits to encode

### 1.18.3.12 virtual void EncodeCharString (System.String *value*, int *nchars*, int *offset*, int *abpc*, int *ubpc*, Asn1CharSet *charSet*) [virtual]

This method encodes the contents of a known-multiplier character string type. This version assumes a permitted alphabet constraint was specified.

#### Parameters

*value* String containing characters to encode

*nchars* Number of characters from string to encode

*offset* Offset to first char in string to encode

*abpc* Number of bits per character (aligned)

*ubpc* Number of bits per character (unaligned)

*charSet* Object representing permitted alphabet constraint character set (optional)

### 1.18.3.13 virtual void EncodeConsWholeNumber (long *adjustedValue*, long *rangeValue*) [virtual]

This method implements the rules to encode a constrained whole number as specified in section 10.5 of the X.691 standard. The *ident* argument which is used for tracing is defaulted to 'value'.

#### Parameters

*adjustedValue* Adjusted value to be encoded = value - lower range endpoint value

*rangeValue* lower - upper + 1

### 1.18.3.14 virtual void EncodeConsWholeNumber (long *adjustedValue*, long *rangeValue*, System.String *ident*) [virtual]

This method implements the rules to encode a constrained whole number as specified in section 10.5 of the X.691 standard.

#### Parameters

*adjustedValue* Adjusted value to be encoded = value - lower range endpoint value

*rangeValue* lower - upper + 1

*ident* Tracing identifier

### 1.18.3.15 virtual void EncodeInt (long value, bool encodeLen, bool signExtend) [virtual]

This method implements the rules to encode either a non-negative binary integer as specified in section 10.3 or a two's complement binary integer as specified in section 10.4 of the X.691 standard. The `ident` argument which is used for tracing is defaulted to 'value'.

#### Parameters

*value* Integer value to be encoded

*encodeLen* Flag indicating length determinant should be encoded before encoding integer value.

*signExtend* Flag indicating if sign extension should be performed.

### 1.18.3.16 virtual void EncodeInt (long value, bool encodeLen, bool signExtend, System.String ident) [virtual]

This method implements the rules to encode either a non-negative binary integer as specified in section 10.3 or a two's complement binary integer as specified in section 10.4 of the X.691 standard.

#### Parameters

*value* Integer value to be encoded

*encodeLen* Flag indicating length determinant should be encoded before encoding integer value.

*signExtend* Flag indicating if sign extension should be performed.

*ident* Tracing identifier

### 1.18.3.17 virtual void EncodeInt (long value, int nbits) [virtual]

This method encodes bit values from an integer value. The least significant bits from the integer are encoded. The `ident` argument which is used for tracing is defaulted to 'value'.

#### Parameters

*value* Integer containing bits to be encoded

*nbits* Number of bits to encode

### 1.18.3.18 virtual void EncodeInt (long value, int nbits, System.String ident) [virtual]

This method encodes bit values from an integer value. The least significant bits from the integer are encoded.

#### Parameters

*value* Integer containing bits to be encoded

*nbits* Number of bits to encode

*ident* Tracing identifier

### 1.18.3.19 virtual void EncodeLength (long value, long lower, long upper) [virtual]

This method encodes a constrained length determinant value.

#### Parameters

- value* Length value to be encoded
- lower* Lower bound (inclusive) of length value range
- upper* Upper bound (inclusive) of length value range

### 1.18.3.20 virtual long EncodeLength (long value) [virtual]

This method encodes either a constrained or unconstrained length depending on whether a size constraint object is set in this object.

#### Parameters

- value* Length value to be encoded

#### Returns

Value that was actually encoded. This may be less than the value that was passed in if fragmentation was done (i.e the value was  $\geq 16k$ ).

### 1.18.3.21 virtual void EncodeLengthEOM (long value) [virtual]

This method checks to see if a zero byte needs to be added after a fragmented length has been encoded. It will add it to the byte stream if necessary.

#### Parameters

- value* Original length value that was encoded.

### 1.18.3.22 virtual void EncodeOctetString (byte[] value, int offset, int nbytes) [virtual]

This method encodes the given array of bytes as an unconstrained octet string value.

#### Parameters

- value* Byte array containing data to encode. This is assumed to contain a previously encoded PER component.
- offset* Starting offset in byte array value
- nbytes* Number of bytes to encode

### 1.18.3.23 virtual void EncodeOIDLengthAndValue (int[] value) [virtual]

This method encodes the length and contents of an object identifier value.

#### Parameters

- value* Integer array containing arcs to encode

**1.18.3.24 virtual void EncodeOpenType (Asn1PerEncodeBuffer *buffer*, System.String *elemName*) [virtual]**

This overloaded version of encodeOpenType will encode the component in the given PER encode buffer into this PER encode buffer.

**Parameters**

*buffer* PER encode buffer containing encoded message component.

*elemName* Name of element being encoded.

**1.18.3.25 virtual void EncodeOpenType (byte[] *value*, int *offset*, int *nbytes*) [virtual]**

This method encodes the given array of bytes as an open type.

**Parameters**

*value* Byte array containing data to encode. This is assumed to contain a previously encoded PER component.

*offset* Starting offset in byte array value

*nbytes* Number of bytes to encode

**1.18.3.26 virtual void EncodeRelOIDLengthAndValue (int[] *value*) [virtual]**

This method encodes the length and contents of a relative object identifier value.

**Parameters**

*value* Integer array containing arcs to encode

**1.18.3.27 virtual void EncodeSmallLength (int *value*) [virtual]**

This method implements the rules to encode a normally small length as specified in section 11.9 of the X.691 standard.

**Parameters**

*value* Value to be encoded

**1.18.3.28 virtual void EncodeSmallNonNegWholeNumber (int *value*) [virtual]**

This method implements the rules to encode a small non-negative whole number as specified in section 10.6 of the X.691 standard.

**Parameters**

*value* Value to be encoded

### 1.18.3.29 virtual long EncodeUnconsLength (long *value*) [virtual]

This method encodes a general (unconstrained) length determinant value as described in section 10.9 or the X.691 standard.

#### Parameters

*value* Length value to be encoded

#### Returns

Value that was actually encoded. This may be less than the value that was passed in if fragmentation was done (i.e the value was  $\geq 16k$ ).

### 1.18.3.30 override System.IO.Stream GetInputStream ()

This method returns an input stream representing the encoded message. This method is defined as abstract in the base class and must be implemented by all derived classes. In this case, a byte array input stream is returned.

#### Returns

Input stream containing encoded message

Implements [Asn1PerMessageBuffer](#).

### 1.18.3.31 override void HexDump ()

This method dumps the encoded message in hex/ascii format to the standard output stream.

### 1.18.3.32 virtual bool IsAligned () [virtual]

This method is used to test if PER aligned encoding has been specified.

#### Returns

`true` for PER aligned encoding or `false` for unaligned encoding.

Implements [Asn1PerMessageBuffer](#).

### 1.18.3.33 override void Reset ()

This method resets the buffer object so that it can be reused to encode another PER message. Any previously encoded data is lost.

### 1.18.3.34 virtual void ReverseBytes (int *offset*, int *nbytes*) [virtual]

This method reverses a series of bytes at a given offset within the encode buffer.

#### Parameters

*offset* Starting byte offset within the buffer

*nbytes* Number of bytes to reverse

### 1.18.3.35 virtual void SetAligned (bool *value*) [virtual]

This method is used to turn PER aligned encoding on or off

#### Parameters

*value* true for PER aligned encoding or false for unaligned encoding.

### 1.18.3.36 void SetSizeConstraint (long *lower*, long *upper*)

This method is used to set a size constraint within the buffer object. The constraint will only be set if an existing constraint is not already in place (i.e. if the existing reference is not null). This is used for length decoding of SEQUENCE OF objects to pass constraints applied to referenced objects to the base object.

### 1.18.3.37 void SetSizeConstraintExt (long *lower*, long *upper*, long *extLower*, long *extUpper*)

This method is used to set an extensible size constraint in the buffer object. The constraint will only be set if an existing constraint is not already in place (i.e. if the existing reference is not null). This is used for length encoding of SEQUENCE OF objects to pass constraints applied to referenced objects to the base object.

### 1.18.3.38 override System.String ToString ()

This method will return a string representation of the data in the encode buffer. The format is hex characters.

#### Returns

Stringified representation of the value

### 1.18.3.39 override void Write (System.IO.Stream *outs*)

This method writes the encoded record to the given output stream.

#### Parameters

*outs* Output stream to which record is to be written

## 1.18.4 Member Data Documentation

### 1.18.4.1 internal Asn1PerTraceHandler mTraceHandler [protected]

Variable holds the PER message trace handler

## 1.18.5 Property Documentation

### 1.18.5.1 virtual byte [] Buffer [get]

Gets a reference to the byte buffer used to hold the encoded message.

**Value:** Byte buffer reference

#### **1.18.5.2 virtual System.IO.MemoryStream ByteArrayInputStream [get]**

Gets a reference to a byte array input stream representing the encoded message. This is the preferred way to access the contents of the encoded message as it is the most efficient.

**Value:** byte array input stream containing encoded message

#### **1.18.5.3 virtual int ByteIndex [get]**

Gets the current byte index into the encode buffer.

**Value:** Byte index value

#### **1.18.5.4 virtual int MsgBitCnt [get]**

Gets the number of bits in the encoded PER message.

**Value:** Count of bits in encoded message

Implements [Asn1PerMessageBuffer](#).

#### **1.18.5.5 virtual int MsgByteCnt [get]**

Gets the number of bytes in the encoded PER message. The number is rounded up to include the last byte if one or more bits have been set in that byte.

**Value:** Count of bytes in encoded message

#### **1.18.5.6 override byte [] MsgCopy [get]**

Gets the encoded message in a byte array. This is less efficient than the `ByteArrayInputStream` property because the message contents must be copied to a newly created byte array.

**Value:** byte array containing encoded message

#### **1.18.5.7 override int MsgLength [get]**

Gets the length (in bytes) of the encoded message component.

**Value:** length of encoded message component

#### **1.18.5.8 virtual Asn1PerTraceHandler TraceHandler [get]**

Gets a reference to the internal trace handler object used to trace the bit fields within a PER message.

**Value:** [Asn1PerTraceHandler](#) object

Implements [Asn1PerMessageBuffer](#).



## 1.19 Asn1PerEncodeTraceHandler Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1PerTraceHandler](#).

### Public Member Functions

- [Asn1PerEncodeTraceHandler](#) ([Asn1PerEncodeBuffer](#) messageBuffer)
- override void [Enable](#) ()
- override void [Print](#) (System.IO.StreamWriter outs, System.String varName)
- override void [Reset](#) ()

### 1.19.1 Detailed Description

This is a utility class for handling the collection and printing of PER bit field trace information. An object of the class is present within both the [Asn1PerEncodeBuffer](#) and [Asn1PerDecodeBuffer](#) classes. It is accessed using the 'TraceHandler' property from objects of these classes.

### 1.19.2 Constructor & Destructor Documentation

#### 1.19.2.1 Asn1PerEncodeTraceHandler ([Asn1PerEncodeBuffer](#) *messageBuffer*)

This constructor initializes internal trace handler member variables.

#### Parameters

*messageBuffer* PER encode message buffer object reference

### 1.19.3 Member Function Documentation

#### 1.19.3.1 override void [Enable](#) () [virtual]

This method is used to turn PER bit tracing on

Implements [Asn1PerTraceHandler](#).

#### 1.19.3.2 override void [Print](#) (System.IO.StreamWriter *outs*, System.String *varName*) [virtual]

This method prints the trace to the given output stream in a default format.

#### Parameters

*outs* Print stream to which output is to be written.

*varName* Name of the object variable being printed.

Implements [Asn1PerTraceHandler](#).

#### 1.19.3.3 override void [Reset](#) () [virtual]

This method resets the trace bit field list.

Implements [Asn1PerTraceHandler](#).

## 1.20 Asn1PerInputStream Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1PerDecodeBuffer](#).

### Public Member Functions

- [Asn1PerInputStream](#) (System.IO.Stream istream, bool aligned)
- virtual int [Available](#) ()
- virtual void [Close](#) ()
- override void [Mark](#) ()
- virtual bool [MarkSupported](#) ()
- override void [Reset](#) ()
- override long [Skip](#) (long nbytes)

### 1.20.1 Detailed Description

This class handles the input stream for decoding of ASN.1 messages as specified in the Packed Encoding Rules (PER) ITU-T X.691 standard.

### 1.20.2 Constructor & Destructor Documentation

#### 1.20.2.1 Asn1PerInputStream (System.IO.Stream *istream*, bool *aligned*)

This constructor creates a PER input stream object that references an encoded ASN.1 message. In this case, the message is passed in using an System.IO.Stream object.

#### Parameters

*istream* Input stream containing an encoded ASN.1 message.

*aligned* Boolean specifying PER aligned or unaligned encoding.

### 1.20.3 Member Function Documentation

#### 1.20.3.1 virtual int Available () [virtual]

Returns the number of bytes that can be read (or skipped over) from this input stream without blocking by the next caller of a method for this input stream. The next caller might be the same thread or another thread.

#### Returns

the number of bytes that can be read from this input stream without blocking.

#### Exceptions

*System.SystemException* if an I/O error occurs.

### 1.20.3.2 virtual void Close () [virtual]

Closes this input stream and releases any system resources associated with the stream.

#### Exceptions

*System.SystemException* if an I/O error occurs.

### 1.20.3.3 override void Mark ()

This method is used to mark the current position in the input stream for retry processing or resetting the input stream position to current position.

### 1.20.3.4 virtual bool MarkSupported () [virtual]

Tests if this input stream supports the seeking. This method is equivalent to C# `CanSeek` method of `System.IO.Stream`.

#### Returns

`true` if input stream supports seeking; Otherwise `false`.

### 1.20.3.5 override void Reset ()

This method is used to reset the current position in the input stream back to the location of the last 'mark' call. It is equivalent to calling 'Stream.Position' to marked location.

### 1.20.3.6 override long Skip (long nbytes)

This method will skip over the requested number of bytes in the input stream.

#### Parameters

*nbytes* Number of bytes to skip

#### Exceptions

*System.SystemException* if an I/O error occurs.

#### Returns

Skipped number of bytes

## 1.21 Asn1PerMessageBuffer Interface Reference

Inherited by [Asn1PerDecodeBuffer](#), and [Asn1PerEncodeBuffer](#).

### Public Member Functions

- void [ByteAlign](#) ()
- System.IO.Stream [GetInputStream](#) ()
- bool [IsAligned](#) ()

### Properties

- int [MsgBitCnt](#) [get]
- [Asn1PerTraceHandler](#) [TraceHandler](#) [get]

#### 1.21.1 Detailed Description

This interface defines constants and methods specific to encoding and decoding PER messages. All of the PER message buffer classes implement this interface.

#### 1.21.2 Member Function Documentation

##### 1.21.2.1 void [ByteAlign](#) ()

This method handles byte-alignment for aligned PER encoding or decoding.

Implemented in [Asn1PerDecodeBuffer](#), and [Asn1PerEncodeBuffer](#).

##### 1.21.2.2 System.IO.Stream [GetInputStream](#) ()

This method returns an input stream object that represents the message being encoded or decoded.

##### Returns

Stream containing message

Implemented in [Asn1PerEncodeBuffer](#).

##### 1.21.2.3 bool [IsAligned](#) ()

This method returns a flag indicating if PER aligned encoding is currently enabled (if false, unaligned is in effect).

##### Returns

true is aligned; otherwise false

Implemented in [Asn1PerDecodeBuffer](#), and [Asn1PerEncodeBuffer](#).

### 1.21.3 Property Documentation

#### 1.21.3.1 `int MsgBitCnt` [`get`]

Gets the number of bits in the PER message.

**Value:** Count of bits in message

Implemented in [Asn1PerDecodeBuffer](#), and [Asn1PerEncodeBuffer](#).

#### 1.21.3.2 `Asn1PerTraceHandler TraceHandler` [`get`]

Gets a reference to the internal trace handler object used to trace the bit fields within a PER message.

**Value:** [Asn1PerTraceHandler](#) object

Implemented in [Asn1PerDecodeBuffer](#), and [Asn1PerEncodeBuffer](#).

## 1.22 Asn1PerOutputStream Class Reference

### Public Member Functions

- virtual void [AddCaptureBuffer](#) (System.IO.MemoryStream buffer)
- [Asn1PerOutputStream](#) (System.IO.Stream os, int bufSize, bool aligned)
- [Asn1PerOutputStream](#) (System.IO.Stream os, bool aligned)
- virtual void [BinDump](#) (System.IO.StreamWriter outs, System.String varName)
- virtual void [BinDump](#) (System.String varName)
- virtual void [ByteAlign](#) ()
- override void [Close](#) ()
- virtual void [EncodeBit](#) (bool value, System.String ident)
- virtual void [EncodeBit](#) (bool value)
- virtual void [EncodeBits](#) (byte[] value, int offset, int nbits, System.String ident)
- virtual void [EncodeBits](#) (byte[] value, int offset, int nbits)
- virtual void [EncodeBits](#) (byte value, int nbits)
- virtual void [EncodeCharString](#) (System.String value, int nchars, int offset, int abpc, int ubpc, Asn1CharSet charSet)
- virtual void [EncodeConsWholeNumber](#) (long adjustedValue, long rangeValue)
- virtual void [EncodeConsWholeNumber](#) (long adjustedValue, long rangeValue, System.String ident)
- virtual void [EncodeInt](#) (long value, bool encodeLen, bool signExtend)
- virtual void [EncodeInt](#) (long value, bool encodeLen, bool signExtend, System.String ident)
- virtual void [EncodeInt](#) (long value, int nbits)
- virtual void [EncodeInt](#) (long value, int nbits, System.String ident)
- virtual void [EncodeLength](#) (long value, long lower, long upper)
- virtual long [EncodeLength](#) (long value)
- virtual void [EncodeLengthEOM](#) (long value)
- virtual void [EncodeOctetString](#) (byte[] value, int offset, int nbytes)
- virtual void [EncodeOIDLengthAndValue](#) (int[] value)
- virtual void [EncodeOpenType](#) (byte[] value, int offset, int nbytes)
- virtual void [EncodeRelOIDLengthAndValue](#) (int[] value)
- virtual void [EncodeSmallLength](#) (int value)
- virtual void [EncodeSmallNonNegWholeNumber](#) (int value)
- override void [Flush](#) ()
- virtual void [RemoveCaptureBuffer](#) (System.IO.MemoryStream buffer)
- override void [Write](#) (System.Byte[] b, int off, int len)
- override void [Write](#) (byte[] b)
- override void [WriteByte](#) (byte b)
- override void [WriteByte](#) (int b)

### Protected Attributes

- internal [Asn1PerOutputStreamTraceHandler mTraceHandler](#)

### Properties

- virtual bool [Aligned](#) [get]
- virtual [Asn1PerTraceHandler TraceHandler](#) [get]

## 1.22.1 Detailed Description

This class handles the output stream for encoding of ASN.1 messages as specified in the Packed Encoding Rules (PER) ITU-T X.691 standard.

## 1.22.2 Constructor & Destructor Documentation

### 1.22.2.1 `Asn1PerOutputStream` (`System.IO.Stream os`, `bool aligned`)

This constructor creates a buffered PER output stream object with the default size of buffer. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

*os* The underlying `System.IO.Stream` object.

*aligned* Indicates whether PER aligned or unaligned encoding should be done.

### 1.22.2.2 `Asn1PerOutputStream` (`System.IO.Stream os`, `int bufSize`, `bool aligned`)

This constructor creates a buffered PER output stream object with the specified size of buffer. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

*os* The underlying `System.IO.Stream` object.

*bufSize* The buffer size.

*aligned* `true` for PER aligned or `false` for PER unaligned encoding.

## 1.22.3 Member Function Documentation

### 1.22.3.1 `virtual void AddCaptureBuffer` (`System.IO.MemoryStream buffer`) [`virtual`]

This method is used to add a capture buffer to the internal capture buffer list. A capture buffer is used to capture all bytes read from this position forward from the input stream.

#### Parameters

*buffer* Buffer into which captured bytes are to be stored

### 1.22.3.2 `virtual void BinDump` (`System.IO.StreamWriter outs`, `System.String varName`) [`virtual`]

This method dumps the encoded message in a human-readable format showing a bit trace of all fields to the given print output stream.

#### Parameters

*outs* `StreamWriter` object to which output should be written

*varName* Name of top-level message object variable

### 1.22.3.3 virtual void BinDump (System.String varName) [virtual]

This method invokes an overloaded version of BinDump to dump the encoded message to standard output.

#### Parameters

*varName* Name of top-level message object variable

### 1.22.3.4 virtual void ByteAlign () [virtual]

This methods byte-aligns the buffer.

### 1.22.3.5 override void Close ()

Close the stream. Writes all bytes (even unfinished) before closing. Throws, exception thrown by the underlying System.IO.Stream object.

### 1.22.3.6 virtual void EncodeBit (bool value, System.String ident) [virtual]

This method encodes a single bit value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*value* Boolean value of bit to be encoded.

*ident* Bit field identifier name for tracing.

#### Exceptions

*Asn1Exception* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.7 virtual void EncodeBit (bool value) [virtual]

This method encodes a single bit value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*value* Boolean value of bit to be encoded.

#### Exceptions

*Asn1Exception* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.8 virtual void EncodeBits (byte[] value, int offset, int nbits, System.String ident) [virtual]

This method encodes bit values from an array of octets.

Throws, exception thrown by the underlying System.IO.Stream object.



## Parameters

*value* Octet array containing bits to be encoded  
*offset* Starting byte offset in value  
*nbits* Number of bits to encode  
*ident* Bit field identifier name for tracing.

## Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.9 virtual void EncodeBits (byte[] value, int offset, int nbits) [virtual]

This method encodes bit values from an array of octets.

Throws, exception thrown by the underlying System.IO.Stream object.

## Parameters

*value* Octet array containing bits to be encoded  
*offset* Starting byte offset in value  
*nbits* Number of bits to encode

## Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.10 virtual void EncodeBits (byte value, int nbits) [virtual]

This method encodes bit values from an octet. The most significant bits from the octet are encoded.

Throws, exception thrown by the underlying System.IO.Stream object.

## Parameters

*value* Octet containing bits to be encoded  
*nbits* Number of bits to encode

## Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.11 virtual void EncodeCharString (System.String value, int nchars, int offset, int abpc, int ubpc, Asn1CharSet charSet) [virtual]

This method encodes the contents of a known-multiplier character string type. This version assumes a permitted alphabet constraint was specified.

Throws, exception thrown by the underlying System.IO.Stream object.

## Parameters

*value* String containing characters to encode

*nchars* Number of characters from string to encode  
*offset* Offset to first char in string to encode  
*abpc* Number of bits per character (aligned)  
*ubpc* Number of bits per character (unaligned)  
*charSet* Object representing permitted alphabet constraint character set (optional)

### Exceptions

*Asn1Exception* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.12 virtual void EncodeConsWholeNumber (long *adjustedValue*, long *rangeValue*) [virtual]

This method implements the rules to encode a constrained whole number as specified in section 10.5 of the X.691 standard.

Throws, exception thrown by the underlying System.IO.Stream object.

### Parameters

*adjustedValue* Adjusted value to be encoded = value - lower range endpoint value  
*rangeValue* lower - upper + 1

### Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.13 virtual void EncodeConsWholeNumber (long *adjustedValue*, long *rangeValue*, System.String *ident*) [virtual]

This method implements the rules to encode a constrained whole number as specified in section 10.5 of the X.691 standard.

Throws, exception thrown by the underlying System.IO.Stream object.

### Parameters

*adjustedValue* Adjusted value to be encoded = value - lower range endpoint value  
*rangeValue* lower - upper + 1  
*ident* Bit field identifier name for tracing.

### Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.14 virtual void EncodeInt (long *value*, bool *encodeLen*, bool *signExtend*) [virtual]

This method implements the rules to encode either a non-negative binary integer as specified in section 10.3 or a two's complement binary integer as specified in section 10.4 of the X.691 standard.

Throws, exception thrown by the underlying System.IO.Stream object.

## Parameters

*value* Integer value to be encoded

*encodeLen* Flag indicating length determinant should be encoded before encoding integer value.

*signExtend* Flag indicating if sign extension should be performed.

## Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.15 virtual void EncodeInt (long value, bool encodeLen, bool signExtend, System.String ident) [virtual]

This method implements the rules to encode either a non-negative binary integer as specified in section 10.3 or a two's complement binary integer as specified in section 10.4 of the X.691 standard.

Throws, exception thrown by the underlying System.IO.Stream object.

## Parameters

*value* Integer value to be encoded

*encodeLen* Flag indicating length determinant should be encoded before encoding integer value.

*signExtend* Flag indicating if sign extension should be performed.

*ident* Bit field identifier name for tracing.

## Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.16 virtual void EncodeInt (long value, int nbits) [virtual]

This method encodes bit values from an integer value. The least significant bits from the integer are encoded.

Throws, exception thrown by the underlying System.IO.Stream object.

## Parameters

*value* Integer containing bits to be encoded

*nbits* Number of bits to encode

## Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.17 virtual void EncodeInt (long value, int nbits, System.String ident) [virtual]

This method encodes bit values from an integer value. The least significant bits from the integer are encoded.

Throws, exception thrown by the underlying System.IO.Stream object.

## Parameters

*value* Integer containing bits to be encoded

*nbits* Number of bits to encode  
*ident* Bit field identifier name for tracing.

### Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.18 virtual void EncodeLength (long value, long lower, long upper) [virtual]

This method encodes a constrained length determinant value.

Throws, exception thrown by the underlying System.IO.Stream object.

### Parameters

*value* Length value to be encoded  
*lower* Lower bound (inclusive) of length value range  
*upper* Upper bound (inclusive) of length value range

### Exceptions

*Asn1Exception* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.19 virtual long EncodeLength (long value) [virtual]

This method encodes a general (unconstrained) length determinant value as described in section 10.9 or the X.691 standard.

Throws, exception thrown by the underlying System.IO.Stream object.

### Parameters

*value* Length value to be encoded

### Returns

Value that was actually encoded. This may be less than the value that was passed in if fragmentation was done (i.e the value was  $\geq 16k$ ).

### Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.20 virtual void EncodeLengthEOM (long value) [virtual]

This method checks to see if a zero byte needs to be added after a fragmented length has been encoded. It will add it to the byte stream if necessary.

Throws, exception thrown by the underlying System.IO.Stream object.

### Parameters

*value* Original length value that was encoded.

### Exceptions

*Asn1Exception* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.21 virtual void EncodeOctetString (byte[] value, int offset, int nbytes) [virtual]

This method encodes the given array of bytes as an unconstrained octet string value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*value* Byte array containing data to encode. This is assumed to contain a previously encoded PER component.

*offset* Starting offset in byte array value

*nbytes* Number of bytes to encode

#### Exceptions

*Asn1Exception* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.22 virtual void EncodeOIDLengthAndValue (int[] value) [virtual]

This method encodes the length and contents of an object identifier value.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*value* Integer array containing arcs to encode

#### Exceptions

*Asn1Exception* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.23 virtual void EncodeOpenType (byte[] value, int offset, int nbytes) [virtual]

This method encodes the given array of bytes as an open type.

Throws, exception thrown by the underlying System.IO.Stream object.

#### Parameters

*value* Byte array containing data to encode. This is assumed to contain a previously encoded PER component.

*offset* Starting offset in byte array value

*nbytes* Number of bytes to encode

#### Exceptions

*Asn1Exception* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

### 1.22.3.24 virtual void EncodeRelOIDLengthAndValue (int[] value) [virtual]

This method encodes the length and contents of a relative object identifier value.

Throws, exception thrown by the underlying System.IO.Stream object.

### Parameters

*value* Integer array containing arcs to encode

### Exceptions

*Asn1Exception* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

#### 1.22.3.25 virtual void EncodeSmallLength (int *value*) [virtual]

This method implements the rules to encode a normally small length as specified in section 11.9 of the X.691 standard.

Throws, exception thrown by the underlying System.IO.Stream object.

### Parameters

*value* Value to be encoded

### Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

#### 1.22.3.26 virtual void EncodeSmallNonNegWholeNumber (int *value*) [virtual]

This method implements the rules to encode a small non-negative whole number as specified in section 10.6 of the X.691 standard.

Throws, exception thrown by the underlying System.IO.Stream object.

### Parameters

*value* Value to be encoded

### Exceptions

*Asn1InvalidArgException* Any exception thrown by the underlying [Asn1PerEncodeBuffer](#).

#### 1.22.3.27 override void Flush ()

Flush the buffer to the stream. It writes whole bytes only. Throws, exception thrown by the underlying System.IO.Stream object.

#### 1.22.3.28 virtual void RemoveCaptureBuffer (System.IO.MemoryStream *buffer*) [virtual]

This method is used to remove a capture buffer from the internal capture buffer list. The add and remove methods can be used to get a set of raw bytes from the input stream for further processing.

### Parameters

*buffer* Buffer in which captured bytes stored

### 1.22.3.29 override void Write (System.Byte[] *b*, int *off*, int *len*)

Writes *len* bytes from the specified byte array to this output stream.

#### Parameters

- b* the data.
- off* The offset in array at which to begin write.
- len* The number of bytes to write.

#### Exceptions

*System.SystemException* if an I/O error occurs. In particular, write call after the the output stream is closed.

### 1.22.3.30 override void Write (byte[] *b*)

Writes *b.length* bytes from the specified byte array to this output stream. The general contract for `write(b)` is that it should have exactly the same effect as the call `Write(b, 0, b.length)`.

#### Parameters

- b* the binary data.

#### Exceptions

*System.SystemException* if an I/O error occurs.

### 1.22.3.31 override void WriteByte (byte *b*)

Writes the specified byte to this output stream.

#### Parameters

- b* the byte.

#### Exceptions

*System.SystemException* if an I/O error occurs. In particular, an write call after the output stream has been closed.

### 1.22.3.32 override void WriteByte (int *b*)

Writes the specified byte to this output stream.

#### Parameters

- b* the byte.

#### Exceptions

*System.SystemException* if an I/O error occurs. In particular, an write call after the output stream has been closed.

## 1.22.4 Member Data Documentation

### 1.22.4.1 internal Asn1PerOutputStreamTraceHandler mTraceHandler [protected]

Variable holds the PER message trace handler

## 1.22.5 Property Documentation

### 1.22.5.1 virtual bool Aligned [get]

Gets PER aligned encoding has been specified.

**Value:** `true` is aligned; otherwise `false`

### 1.22.5.2 virtual Asn1PerTraceHandler TraceHandler [get]

Gets a reference to the internal trace handler object used to trace the bit fields within a PER message.

**Value:** [Asn1PerTraceHandler](#) object



## 1.23 Asn1PerOutputStreamTraceHandler Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1PerTraceHandler](#).

### Public Member Functions

- [Asn1PerOutputStreamTraceHandler](#) ([Asn1PerOutputStream](#) outs)
- override void [Enable](#) ()
- override void [Print](#) (System.IO.StreamWriter outs, System.String varName)
- override void [Reset](#) ()
- virtual void [ResetTrace](#) ()

### 1.23.1 Detailed Description

This is a utility class for handling the collection and printing of PER bit field trace information for PER output stream. An object of the class is present in the [Asn1PerOutputStream](#) classes. It is accessed using the 'TraceHandler' property from objects of these classes.

### 1.23.2 Constructor & Destructor Documentation

#### 1.23.2.1 Asn1PerOutputStreamTraceHandler ([Asn1PerOutputStream](#) outs)

This constructor initializes the internal trace handler member variables.

##### Parameters

*outs* PER message stream object reference

### 1.23.3 Member Function Documentation

#### 1.23.3.1 override void [Enable](#) () [[virtual](#)]

This method is used to turn PER bit tracing on

Implements [Asn1PerTraceHandler](#).

#### 1.23.3.2 override void [Print](#) (System.IO.StreamWriter *outs*, System.String *varName*) [[virtual](#)]

This method prints the trace to the given output stream in a default format.

##### Parameters

*outs* Print stream to which output is to be written.

*varName* Name of the object variable being printed.

Implements [Asn1PerTraceHandler](#).

#### 1.23.3.3 override void [Reset](#) () [[virtual](#)]

This method does nothing here.

Implements [Asn1PerTraceHandler](#).

#### **1.23.3.4 virtual void ResetTrace () [virtual]**

This method resets the trace bit field list.

## 1.24 Asn1PerTraceHandler Class Reference

Inherited by [Asn1PerDecodeTraceHandler](#), [Asn1PerEncodeTraceHandler](#), and [Asn1PerOutputStreamTraceHandler](#).

### Public Member Functions

- virtual void [AddElemName](#) (System.String name, int arrayx)
- abstract void [Enable](#) ()
- virtual void [NewBitField](#) (System.String name, int bitCount)
- abstract void [Print](#) (System.IO.StreamWriter outs, System.String varName)
- virtual void [RemoveLastElemName](#) ()
- abstract void [Reset](#) ()
- virtual void [SetBitCount](#) ()
- virtual void [SetBitOffset](#) ()

### Protected Member Functions

- internal [Asn1PerTraceHandler](#) ([Asn1PerMessageBuffer](#) messageBuffer)

### Protected Attributes

- internal [Asn1PerBitFieldList](#) mBitFieldList

### Properties

- virtual [Asn1PerBitFieldList](#) BitFieldList [get]

#### 1.24.1 Detailed Description

This is the abstract base class for the PER encode and decode trace handler derived classes.

#### 1.24.2 Constructor & Destructor Documentation

##### 1.24.2.1 internal Asn1PerTraceHandler (Asn1PerMessageBuffer *messageBuffer*) [protected]

This constructor initializes internal trace handler member variables.

#### Parameters

*messageBuffer* PER message buffer object reference

#### 1.24.3 Member Function Documentation

##### 1.24.3.1 virtual void AddElemName (System.String *name*, int *arrayx*) [virtual]

This method adds an element name to the current fully qualified name. The fully qualified name is a string of name components separated by dots (ex. a.b.c).

## Parameters

*name* Name component to append to string

*arrayx* Array index if named item is an element in an array (set to -1 otherwise)

### 1.24.3.2 abstract void Enable () [pure virtual]

This method is used to turn PER bit tracing on or off

Implemented in [Asn1PerEncodeTraceHandler](#), [Asn1PerDecodeTraceHandler](#), and [Asn1PerOutputStreamTraceHandler](#).

### 1.24.3.3 virtual void NewBitField (System.String name, int bitCount) [virtual]

This method creates a new bit field and appends it to the bit field list.

## Parameters

*name* Name suffix to append to the current fully qualified name.

*bitCount* Number of bits in the bit field.

### 1.24.3.4 abstract void Print (System.IO.StreamWriter outs, System.String varName) [pure virtual]

This method prints the trace to the given output stream in a default format.

## Parameters

*outs* Print stream to which output is to be written.

*varName* Name of the object variable being printed.

Implemented in [Asn1PerEncodeTraceHandler](#), [Asn1PerDecodeTraceHandler](#), and [Asn1PerOutputStreamTraceHandler](#).

### 1.24.3.5 virtual void RemoveLastElemName () [virtual]

This method removes the last element name in the current fully qualified name string. For example, if the current string is 'a.b.c', it will be 'a.b' after calling this method.

### 1.24.3.6 abstract void Reset () [pure virtual]

This method resets the trace bit field list.

Implemented in [Asn1PerEncodeTraceHandler](#), [Asn1PerDecodeTraceHandler](#), and [Asn1PerOutputStreamTraceHandler](#).

### 1.24.3.7 virtual void SetBitCount () [virtual]

This method sets the bit count within the current bit field to the difference between the current bit offset and the starting bit offset currently stored in the field object.

#### **1.24.3.8 virtual void SetBitOffset () [virtual]**

This method sets the bit offset within the current bit field to the current offset within the PER message buffer.

### **1.24.4 Member Data Documentation**

#### **1.24.4.1 internal Asn1PerBitFieldList mBitFieldsList [protected]**

Variable holds the bit field list

### **1.24.5 Property Documentation**

#### **1.24.5.1 virtual Asn1PerBitFieldList BitBitFieldsList [get]**

Gets a reference to the bit field list

**Value:** bit field list

## 1.25 Asn1PerUtil Class Reference

### Static Public Member Functions

- static int [GetMsgBitCnt](#) (int byteCount, int bitOffset)

#### 1.25.1 Detailed Description

This class contains general purpose static utility functions related to PER encoding/decoding

#### 1.25.2 Member Function Documentation

##### 1.25.2.1 static int GetMsgBitCnt (int *byteCount*, int *bitOffset*) [static]

This method returns the number of bits in an encoded PER message buffer.

##### Parameters

*byteCount* Number of full bytes in message

*bitOffset* Offset to current bit in last byte ((7 - 0) or -1 if no bits used).

##### Returns

Count of bits in encoded message

## 1.26 Asn1SetDuplicateException Class Reference

### Public Member Functions

- [Asn1SetDuplicateException](#) ([Asn1BerDecodeBuffer](#) buffer, Asn1Tag tag)

### 1.26.1 Detailed Description

This class defines the 'ASN.1 set duplicate element' exception that is thrown from BER/DER methods when a SET construct is detected to more than one instance of a given tagged element..

### 1.26.2 Constructor & Destructor Documentation

#### 1.26.2.1 Asn1SetDuplicateException (Asn1BerDecodeBuffer *buffer*, Asn1Tag *tag*)

This constructor creates an exception object with a textual message describing the tag of the duplicate element..

#### Parameters

*buffer* BER decode buffer object reference

*tag* Tag value of duplicate element

## 1.27 Asn1TaggedEventHandler Interface Reference

Inherited by [Asn1BerMessageDumpHandler](#).

### Public Member Functions

- void [Contents](#) (byte[] data)
- void [EndElement](#) (Asn1Tag tag)
- void [StartElement](#) (Asn1Tag tag, int len, byte[] tagLenBytes)

### 1.27.1 Detailed Description

**This interface defines the methods that must be implemented to define**

a SAX-like event handler. These methods are invoked from within the generated C# decode logic when significant events occur during the parsing of an ASN.1 message.

**A tagged event handler differs from a named event handler in**

that it returns the tags from within a BER or DER message instead of the symbolic names. This type of handler can be used to generically parse a message without knowledge of the associated ASN.1 schema definition. It is used in conjunction with the [Asn1BerDecodeBuffer Parse](#) method.

### 1.27.2 Member Function Documentation

#### 1.27.2.1 void Contents (byte[] data)

The contents callback method is invoked when the contents of a primitive data element are parsed.

##### Parameters

*data* Array containing encoded contents bytes.

Implemented in [Asn1BerMessageDumpHandler](#).

#### 1.27.2.2 void EndElement (Asn1Tag tag)

The endElement callback method is invoked when the end of a tagged element is parsed.

##### Parameters

*tag* Parsed tag value.

Implemented in [Asn1BerMessageDumpHandler](#).

#### 1.27.2.3 void StartElement (Asn1Tag tag, int len, byte[] tagLenBytes)

The StartElement callback method is invoked when the start of any tagged element is parsed.

##### Parameters

*tag* Parsed tag value.



*len* Parsed length value

*tagLenBytes* Array containing the encoded bytes that make up the tag/length sequence.

Implemented in [Asn1BerMessageDumpHandler](#).

## 1.28 Asn1TagMatchFailedException Class Reference

### Public Member Functions

- [Asn1TagMatchFailedException](#) ([Asn1BerDecodeBuffer](#) buffer, Asn1Tag expectedTag)
- [Asn1TagMatchFailedException](#) ([Asn1BerDecodeBuffer](#) buffer, Asn1Tag expectedTag, Asn1Tag parsedTag)

### 1.28.1 Detailed Description

This class defines the 'ASN.1 tag match failed' exception that is thrown from BER/DER methods when an expected tag is not matched..

### 1.28.2 Constructor & Destructor Documentation

#### 1.28.2.1 [Asn1TagMatchFailedException](#) ([Asn1BerDecodeBuffer](#) *buffer*, [Asn1Tag](#) *expectedTag*, [Asn1Tag](#) *parsedTag*)

This constructor creates an exception object with a textual message describing the expected and parsed tag values..

#### Parameters

*buffer* BER decode buffer object reference

*expectedTag* Expected tag value

*parsedTag* Parsed tag value

#### 1.28.2.2 [Asn1TagMatchFailedException](#) ([Asn1BerDecodeBuffer](#) *buffer*, [Asn1Tag](#) *expectedTag*)

This constructor creates an exception object with a textual message describing only the expected tag value. It is used in cases where the parsed tag value cannot be determined.

#### Parameters

*buffer* BER decode buffer object reference

*expectedTag* Expected tag value

## 1.29 Asn1XerDecodeBuffer Class Reference

### Public Member Functions

- [Asn1XerDecodeBuffer](#) (System.String source)

### Protected Attributes

- internal [XmlSource mInputSource](#)

### Properties

- virtual [XmlSource InputSource](#) [get]

#### 1.29.1 Detailed Description

This class handles the decoding of ASN.1 messages as specified in the XML Encoding Rules (XER) as documented in the ITU-T X.693 standard. Note that this class is not derived from the `Asn1DecodeBuffer` class as are other decode buffer classes. Its purpose is to act as an input source for XML data to be read by a SAX parser.

#### 1.29.2 Constructor & Destructor Documentation

##### 1.29.2.1 `Asn1XerDecodeBuffer` (System.String source)

This constructor creates an XER decode buffer.

##### Parameters

*source* The source containing the XML document.

#### 1.29.3 Member Data Documentation

##### 1.29.3.1 internal `XmlSource mInputSource` [protected]

Variable holds the SAX input source object.

#### 1.29.4 Property Documentation

##### 1.29.4.1 virtual `XmlSource InputSource` [get]

Gets the SAX input source object.

**Value:** SAX input source object

## 1.30 Asn1XerElemInfo Class Reference

### Public Member Functions

- [Asn1XerElemInfo](#) (System.String[] names, bool optional, int id)
- bool [Matches](#) (System.String name)

### Properties

- virtual int [ID](#) [get]
- virtual bool [Optional](#) [get]

### 1.30.1 Detailed Description

This class holds XER element information needed to assign an identifier to an element after it is parsed from an XML message.

### 1.30.2 Constructor & Destructor Documentation

#### 1.30.2.1 Asn1XerElemInfo (System.String[] names, bool optional, int id)

This constructor creates the element object.

#### Parameters

- names* first element names
- optional* true if component having given names is optional
- id* identifier

### 1.30.3 Member Function Documentation

#### 1.30.3.1 bool Matches (System.String name)

Determines whether this object matches the given element name.

#### Parameters

- name* The element name to check for a match.

#### Returns

`true` if the given element name matches any of the names associated with this object; otherwise, `false`.

### 1.30.4 Property Documentation

#### 1.30.4.1 virtual int ID [get]

Returns the ID value for the element.

**Value:** Identifier value

#### 1.30.4.2 virtual bool Optional [get]

Determines whether the this element is optional

**Value:** true is optional; otherwise false

## 1.31 Asn1XerEncodeBuffer Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1XerEncoder](#).

### Public Member Functions

- [Asn1XerEncodeBuffer](#) (bool canonical, int sizeIncrement)
- [Asn1XerEncodeBuffer](#) (bool canonical)
- [Asn1XerEncodeBuffer](#) ()
- override void [BinDump](#) (System.IO.StreamWriter outs, System.String varName)
- virtual void [Copy](#) (System.String data)
- virtual void [Copy](#) (byte[] data, int off, int len)
- override void [Copy](#) (byte[] data)
- override void [Copy](#) (byte data)
- virtual void [DecrLevel](#) ()
- virtual void [EncodeBinStrValue](#) (byte[] bits, int nbits)
- virtual void [EncodeByte](#) (byte data)
- virtual void [EncodeData](#) (System.String data)
- virtual void [EncodeEmptyElement](#) (System.String elemName)
- virtual void [EncodeEndDocument](#) ()
- virtual void [EncodeEndElement](#) (System.String elemName)
- virtual void [EncodeHexStrValue](#) (byte[] data)
- virtual void [EncodeNamedValue](#) (System.String valueName, System.String elemName)
- virtual void [EncodeNamedValueElement](#) (System.String elemName)
- virtual void [EncodeRealValue](#) (double data, System.String elemName)
- virtual void [EncodeStartDocument](#) ()
- virtual void [EncodeStartElement](#) (System.String elemName)
- override System.IO.Stream [GetInputStream](#) ()
- virtual void [IncrLevel](#) ()
- virtual void [Indent](#) ()
- override void [Reset](#) ()
- override void [Write](#) (System.IO.Stream outs)

### Protected Member Functions

- internal override void [CheckSize](#) (int bytesRequired)

### Properties

- virtual byte[] [Buffer](#) [get]
- virtual bool [Canonical](#) [set]
- override byte[] [MsgCopy](#) [get]
- override int [MsgLength](#) [get]
- virtual int [State](#) [get, set]

#### 1.31.1 Detailed Description

This class handles the encoding of ASN.1 messages as specified in the XML Encoding Rules (XER) as specified in the ITU-T X.693 standard.

## 1.31.2 Constructor & Destructor Documentation

### 1.31.2.1 Asn1XerEncodeBuffer ()

The default constructor creates an XER encode buffer object with the default size increment and canonical set to false.

### 1.31.2.2 Asn1XerEncodeBuffer (bool *canonical*)

The parameterized constructor creates an XER encode buffer object with default size increment and canonical set to the given values.

#### Parameters

*canonical* Boolean indicating a canonical or non-canonical encoding should be produced as defined in the X.693 standard.

### 1.31.2.3 Asn1XerEncodeBuffer (bool *canonical*, int *sizeIncrement*)

The parameterized constructor creates an XER encode buffer object with size increment and canonical set to the given values.

#### Parameters

*canonical* Boolean indicating a canonical or non-canonical encoding should be produced as defined in the X.693 standard.

*sizeIncrement* The initial size in bytes of an encode buffer. If the buffer becomes full, it will be expanded by the amount. If this parameter is set to zero, the default increment will be used.

## 1.31.3 Member Function Documentation

### 1.31.3.1 override void BinDump (System.IO.StreamWriter *outs*, System.String *varName*)

This method dumps the encoded message in a human-readable format showing a bit trace of all fields to the given print output stream.

#### Parameters

*outs* Output will be written to this stream

*varName* Name of the Decoded ASN1 Type

### 1.31.3.2 internal override void CheckSize (int *bytesRequired*) [protected]

This method determines if the encode buffer can hold the requested number of bytes. If not, the buffer is expanded.

#### Parameters

*bytesRequired* Number of required bytes.

### 1.31.3.3 virtual void Copy (System.String *data*) [virtual]

This method copies a character string to the encode buffer.

#### Parameters

*data* The string value to copy

### 1.31.3.4 virtual void Copy (byte[] *data*, int *off*, int *len*) [virtual]

This method copies multiple bytes to the encode buffer. It is assumed the byte are already formatted into a valid XML encoding type (for example, UTF-8).

#### Parameters

*data* Array of bytes to copy to the encode buffer

*off* The offset in array at which to begin copy.

*len* The number of bytes to copy

### 1.31.3.5 override void Copy (byte[] *data*)

This method copies multiple bytes to the encode buffer. It is assumed the byte are already formatted into a valid XML encoding type (for example, UTF-8).

#### Parameters

*data* Array of bytes to copy to the encode buffer

### 1.31.3.6 override void Copy (byte *data*)

This method is used to copy a single byte to the encode buffer. It first converts the byte to a hex character representation and then copies it to the output buffer.

#### Parameters

*data* The byte value to copy

### 1.31.3.7 virtual void DecrLevel () [virtual]

This method decrements the element nesting level counter.

### 1.31.3.8 virtual void EncodeBinStrValue (byte[] *bits*, int *nbits*) [virtual]

This method encodes XML binary string data

#### Parameters

*bits* Bit String to encode

*nbits* Number of bits to encode



### 1.31.3.9 virtual void EncodeByte (byte *data*) [virtual]

This method is used to encode a single byte to the encode buffer. It first converts the byte to a hex character representation and then copies it to the output buffer.

#### Parameters

*data* The byte value to copy

### 1.31.3.10 virtual void EncodeData (System.String *data*) [virtual]

This method encodes XML string data

#### Parameters

*data* String value to encode

### 1.31.3.11 virtual void EncodeEmptyElement (System.String *elemName*) [virtual]

This method encodes an XML empty element tag

#### Parameters

*elemName* The name of element.

Implements [Asn1XerEncoder](#).

### 1.31.3.12 virtual void EncodeEndDocument () [virtual]

This method encodes standard trailer information at the end of the XML document.

### 1.31.3.13 virtual void EncodeEndElement (System.String *elemName*) [virtual]

This method encodes an XML end element tag

#### Parameters

*elemName* The name of element.

Implements [Asn1XerEncoder](#).

### 1.31.3.14 virtual void EncodeHexStrValue (byte[] *data*) [virtual]

This method encodes XML hexadecimal string data

#### Parameters

*data* Data to encode

**1.31.3.15 virtual void EncodeNamedValue (System.String *valueName*, System.String *elemName*) [virtual]**

This method encodes an XML named value (with start and end tags)

**Parameters**

*elemName* The name of element.

*valueName* named value.

Implements [Asn1XerEncoder](#).

**1.31.3.16 virtual void EncodeNamedValueElement (System.String *elemName*) [virtual]**

This method encodes an XML named value element tag

**Parameters**

*elemName* The name of element.

**Exceptions**

*Asn1Exception* Thrown, if operation is failed.

**1.31.3.17 virtual void EncodeRealValue (double *data*, System.String *elemName*) [virtual]**

This method encodes an XML REAL (double) value (with start and end tags).

**Parameters**

*data* The value to be encoded.

*elemName* The name of element. If null, then start and end tags won't be encoded.

**Exceptions**

*Asn1Exception* Thrown, if operation is failed.

Implements [Asn1XerEncoder](#).

**1.31.3.18 virtual void EncodeStartDocument () [virtual]**

This method encodes standard header information at the beginning of the XML document.

**1.31.3.19 virtual void EncodeStartElement (System.String *elemName*) [virtual]**

This method encodes an XML start element tag

**Parameters**

*elemName* The name of element.

Implements [Asn1XerEncoder](#).

### 1.31.3.20 **override System.IO.Stream GetInputStream ()**

This method returns an input stream object reference to the message buffer contents (i.e. the encoded data). If an output stream was selected as the output method, this method returns null.

#### **Returns**

Input stream object reference

### 1.31.3.21 **virtual void IncrLevel () [virtual]**

This method increments the element nesting level counter.

### 1.31.3.22 **virtual void Indent () [virtual]**

This methods indents by adding a new-line followed by whitespace corresponding to the current nesting level to the encode buffer.

### 1.31.3.23 **override void Reset ()**

This method resets the buffer to allow a new record to be encoded into it. Any previously encoded data is lost.

### 1.31.3.24 **override void Write (System.IO.Stream outs)**

This method writes the encoded record to the given output stream.

#### **Parameters**

*outs* Output stream to which record is to be written

## 1.31.4 **Property Documentation**

### 1.31.4.1 **virtual byte [] Buffer [get]**

Gets a reference of the byte buffer used to hold the encoded message.

**Value:** byte array containing encoded message

### 1.31.4.2 **virtual bool Canonical [set]**

Sets the canonical encoding rule.

**Value:** `true` if canonical encoding; otherwise `false`.

### 1.31.4.3 **override byte [] MsgCopy [get]**

Gets the copy of the byte buffer used to hold the encoded message.

**Value:** byte array containing encoded message

#### **1.31.4.4 override int MsgLength [get]**

Gets the length (in bytes) of the encoded message component.

**Value:** length of encoded message component

#### **1.31.4.5 virtual int State [get, set]**

Sets the state of the buffer.

**Value:** buffer stat

Implements [Asn1XerEncoder](#).

## 1.32 Asn1XerEncoder Interface Reference

Inherited by [Asn1XerEncodeBuffer](#), and [Asn1XerOutputStream](#).

### Public Member Functions

- void [EncodeEmptyElement](#) (System.String elemName)
- void [EncodeEndElement](#) (System.String elemName)
- void [EncodeNamedValue](#) (System.String valueName, System.String elemName)
- void [EncodeRealValue](#) (double valueName, System.String elemName)
- void [EncodeStartElement](#) (System.String elemName)

### Properties

- int [State](#) [get, set]

### 1.32.1 Detailed Description

This is a base interface for encoding of ASN.1 messages as specified in the XML Encoding Rules (XER) as specified in the ITU-T X.693 standard. It is implemented by both the [Asn1XerEncodeBuffer](#) and [Asn1XerOutputStream](#).

### 1.32.2 Member Function Documentation

#### 1.32.2.1 void EncodeEmptyElement (System.String *elemName*)

This method encodes an XML empty element tag.

Throws C# Exception, If I/O error occurs.

#### Parameters

*elemName* The name of element.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Implemented in [Asn1XerEncodeBuffer](#), and [Asn1XerOutputStream](#).

#### 1.32.2.2 void EncodeEndElement (System.String *elemName*)

This method encodes an XML start element and attribute tag. start tag will contain the attribute name and value

Throws C# Exception, If I/O error occurs.

#### Parameters

*elemName* The name of element.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Implemented in [Asn1XerEncodeBuffer](#), and [Asn1XerOutputStream](#).

### 1.32.2.3 void EncodeNamedValue (System.String valueName, System.String elemName)

This method encodes an XML named value (with start and end tags).

Throws C# Exception, If I/O error occurs.

#### Parameters

*valueName* The name of value.

*elemName* The name of element.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Implemented in [Asn1XerEncodeBuffer](#), and [Asn1XerOutputStream](#).

### 1.32.2.4 void EncodeRealValue (double valueName, System.String elemName)

This method encodes an XML REAL (double) value (with start and end tags).

Throws C# Exception, If I/O error occurs.

#### Parameters

*valueName* The name of value.

*elemName* The name of element. If null, then start and end tags won't be encoded.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Implemented in [Asn1XerEncodeBuffer](#), and [Asn1XerOutputStream](#).

### 1.32.2.5 void EncodeStartElement (System.String elemName)

This method encodes an XML start element tag.

Throws C# Exception, If I/O error occurs.

#### Parameters

*elemName* The name of element.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Implemented in [Asn1XerEncodeBuffer](#), and [Asn1XerOutputStream](#).

## 1.32.3 Property Documentation

### 1.32.3.1 int State [get, set]

This method gets and sets the state of the buffer.

**Value:** Buffer Stat

Implemented in [Asn1XerEncodeBuffer](#), and [Asn1XerOutputStream](#).

## 1.33 Asn1XerEncoder\_Fields Struct Reference

### Static Public Attributes

- static readonly int [XERDATA](#) = 2
- static readonly int [XEREND](#) = 3
- static readonly int [XERINDENT](#) = 3
- static readonly int [XERINIT](#) = 0
- static readonly int [XERSTART](#) = 1

### 1.33.1 Detailed Description

This class defines the constant variables for [Asn1XerEncoder](#).

### 1.33.2 Member Data Documentation

#### 1.33.2.1 readonly int XERDATA = 2 [static]

XER characters (data) state

#### 1.33.2.2 readonly int XEREND = 3 [static]

XER end element state

#### 1.33.2.3 readonly int XERINDENT = 3 [static]

Number of indent spaces required to print XER element

#### 1.33.2.4 readonly int XERINIT = 0 [static]

XER initialization state

#### 1.33.2.5 readonly int XERSTART = 1 [static]

XER start element state

## 1.34 Asn1XerOpenType Class Reference

### Public Member Functions

- [Asn1XerOpenType](#) (byte[] data, int offset, int nbytes)
- [Asn1XerOpenType](#) (byte[] data)
- [Asn1XerOpenType](#) ()

### 1.34.1 Detailed Description

This is a container class for holding the an ASN.1 open type value. This is a special version of the class that is only generated for the XER encoding rules. The data held in objects of this type should be UTF-8 encoded XML

### 1.34.2 Constructor & Destructor Documentation

#### 1.34.2.1 Asn1XerOpenType ()

This constructor creates an empty type that can be used in a Decode method call to receive an encoded value.

#### 1.34.2.2 Asn1XerOpenType (byte[] data)

This constructor initializes an open type from the given byte array. The array is assumed to contain a previously encoded message component. The data is assumed to be UTF-8 encoded XML. It should represent an XML encoding of the actual type.

#### Parameters

*data* Byte array containing a previously encoded value.

#### 1.34.2.3 Asn1XerOpenType (byte[] data, int offset, int nbytes)

This constructor initializes the open type from a portion of the given byte array. A new byte array is created starting at the given offset and consisting of the given number of bytes. The data is assumed to be UTF-8 encoded XML. It should represent an XML encoding of the actual type.

#### Parameters

*data* Byte array containing a previously encoded value.

*offset* The byte offset in array at which to begin.

*nbytes* Number of bytes to copy from offset



## 1.35 Asn1XerOutputStream Class Reference

Inherits [Com::Objsys::Asn1::Runtime::Asn1XerEncoder](#).

### Public Member Functions

- [Asn1XerOutputStream](#) (System.IO.Stream os, bool canonical, int bufSize)
- [Asn1XerOutputStream](#) (System.IO.Stream os)
- virtual void [Copy](#) (System.String data)
- virtual void [Copy](#) (byte[] data, int off, int len)
- virtual void [Copy](#) (byte[] data)
- virtual void [Copy](#) (byte data)
- virtual void [DecrLevel](#) ()
- virtual void [EncodeBinStrValue](#) (byte[] bits, int nbits)
- virtual void [EncodeByte](#) (byte data)
- virtual void [EncodeData](#) (System.String data)
- virtual void [EncodeEmptyElement](#) (System.String elemName)
- virtual void [EncodeEndDocument](#) ()
- virtual void [EncodeEndElement](#) (System.String elemName)
- virtual void [EncodeHexStrValue](#) (byte[] data)
- virtual void [EncodeNamedValue](#) (System.String valueName, System.String elemName)
- virtual void [EncodeNamedValueElement](#) (System.String elemName)
- virtual void [EncodeRealValue](#) (double data, System.String elemName)
- virtual void [EncodeStartDocument](#) ()
- virtual void [EncodeStartElement](#) (System.String elemName)
- virtual void [IncrLevel](#) ()
- virtual void [Indent](#) ()
- virtual void [Write](#) (System.String data)

### Properties

- virtual bool [Canonical](#) [set]
- virtual int [State](#) [get, set]

### 1.35.1 Detailed Description

This class implements the output stream to encode ASN.1 messages as specified in the XML Encoding Rules (XER) as specified in the ITU-T X.693 standard. A reference to an object of this type is passed to each of the ASN.1 type encode methods involved in encoding a particular message type.

### 1.35.2 Constructor & Destructor Documentation

#### 1.35.2.1 Asn1XerOutputStream (System.IO.Stream os)

This constructor creates a buffered XER output stream object with default size of buffer. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

- os* The underlying System.IO.Stream object.

### 1.35.2.2 Asn1XerOutputStream (System.IO.Stream *os*, bool *canonical*, int *bufSize*)

This constructor creates a buffered XER output stream object. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

*os* The underlying System.IO.Stream object.

*canonical* Boolean indicating a canonical or non-canonical encoding should be produced as defined in the X.693 standard.

*bufSize* The buffer size. If it is 0 then the output stream is used as unbuffered.

## 1.35.3 Member Function Documentation

### 1.35.3.1 virtual void Copy (System.String *data*) [virtual]

This method copies a character string to the output stream.

Throws, exception thrown by the underlying System.IO.Stream.

#### Parameters

*data* The string value to copy

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.35.3.2 virtual void Copy (byte[] *data*, int *off*, int *len*) [virtual]

This method copies multiple bytes to the output stream. It is assumed the byte are already formatted into a valid XML encoding type (for example, UTF-8).

Throws, exception thrown by the underlying System.IO.Stream.

#### Parameters

*data* Array of bytes to copy to the output stream

*off* The offset in array at which to begin copy.

*len* The Number of bytes to copy

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.35.3.3 virtual void Copy (byte[] *data*) [virtual]

This method copies multiple bytes to the output stream. It is assumed the byte are already formatted into a valid XML encoding type (for example, UTF-8).

Throws, exception thrown by the underlying System.IO.Stream.

## Parameters

*data* Array of bytes to copy to the output stream

## Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.35.3.4 virtual void Copy (byte *data*) [virtual]

This method is used to copy a single byte to the output stream. It first converts the byte to a hex character representation and then copies it to the output buffer.

Throws, exception thrown by the underlying System.IO.Stream.

## Parameters

*data* The byte value to copy

### 1.35.3.5 virtual void DecrLevel () [virtual]

This method decrements the element nesting level counter.

### 1.35.3.6 virtual void EncodeBinStrValue (byte[] *bits*, int *nbits*) [virtual]

This method encodes XML binary string data

Throws, exception thrown by the underlying System.IO.Stream.

## Parameters

*bits* Bit String to encode

*nbits* Number of bits to encode

## Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.35.3.7 virtual void EncodeByte (byte *data*) [virtual]

This method is used to encode a single byte to the output stream. It first converts the byte to a hex character representation and then copies it to the output buffer.

Throws, exception thrown by the underlying System.IO.Stream.

## Parameters

*data* The byte value to copy

### 1.35.3.8 virtual void EncodeData (System.String data) [virtual]

This method encodes XML string data

Throws, exception thrown by the underlying System.IO.Stream.

#### Parameters

*data* String value to encode

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.35.3.9 virtual void EncodeEmptyElement (System.String elemName) [virtual]

This method encodes an XML empty element tag.

Throws, exception thrown by the underlying System.IO.Stream.

#### Parameters

*elemName* The name of element.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Implements [Asn1XerEncoder](#).

### 1.35.3.10 virtual void EncodeEndDocument () [virtual]

This method encodes standard trailer information at the end of the XML document.

Throws, exception thrown by the underlying System.IO.Stream.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.35.3.11 virtual void EncodeEndElement (System.String elemName) [virtual]

This method encodes an XML end element tag.

Throws, exception thrown by the underlying System.IO.Stream.

#### Parameters

*elemName* The name of element.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Implements [Asn1XerEncoder](#).

### 1.35.3.12 virtual void EncodeHexStrValue (byte[] data) [virtual]

This method encodes XML hexadecimal string data

Throws, exception thrown by the underlying System.IO.Stream.

#### Parameters

*data* Data to encode

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.35.3.13 virtual void EncodeNamedValue (System.String valueName, System.String elemName) [virtual]

This method encodes an XML named value (with start and end tags).

Throws, exception thrown by the underlying System.IO.Stream.

#### Parameters

*valueName* The named value.

*elemName* The name of element.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Implements [Asn1XerEncoder](#).

### 1.35.3.14 virtual void EncodeNamedValueElement (System.String elemName) [virtual]

This method encodes an XML named value element tag.

Throws, exception thrown by the underlying System.IO.Stream.

#### Parameters

*elemName* The name of element.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.35.3.15 virtual void EncodeRealValue (double data, System.String elemName) [virtual]

This method encodes an XML REAL (double) value (with start and end tags).

Throws, exception thrown by the underlying System.IO.Stream.

#### Parameters

*data* The value to be encoded.

*elemName* The name of element. If null, then start and end tags won't be encoded.

### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Implements [Asn1XerEncoder](#).

#### 1.35.3.16 virtual void EncodeStartDocument () [virtual]

This method encodes standard header information at the beginning of the XML document.

Throws, exception thrown by the underlying System.IO.Stream.

### Exceptions

*Asn1Exception* Thrown, if operation is failed.

#### 1.35.3.17 virtual void EncodeStartElement (System.String elemName) [virtual]

This method encodes an XML start element tag.

Throws, exception thrown by the underlying System.IO.Stream.

### Parameters

*elemName* The name of element.

### Exceptions

*Asn1Exception* Thrown, if operation is failed.

Implements [Asn1XerEncoder](#).

#### 1.35.3.18 virtual void IncrLevel () [virtual]

This method increments the element nesting level counter.

#### 1.35.3.19 virtual void Indent () [virtual]

This methods indents by adding a new-line followed by whitespace corresponding to the current nesting level to the output stream.

Throws, exception thrown by the underlying System.IO.Stream.

### Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.35.3.20 virtual void Write (System.String *data*) [virtual]

This method copies a character string to the output stream.

Throws, exception thrown by the underlying System.IO.Stream.

#### Parameters

*data* The string value to copy

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

## 1.35.4 Property Documentation

### 1.35.4.1 virtual bool Canonical [set]

Sets the canonical encoding rule.

**Value:** `true` if canonical encoding; otherwise `false`.

### 1.35.4.2 virtual int State [get, set]

Sets the state of the buffer.

**Value:** buffer stat

Implements [Asn1XerEncoder](#).

## 1.36 Asn1XerSaxHandler Class Reference

Inherits [Com::Objsys::Asn1::Runtime::XmlSaxDefaultHandler](#).

### Public Member Functions

- bool [ConsumeStartElement](#) (String namespaceURI, String localName, String qName, [XmlAttributes](#) atts)
- virtual void [EndGroup](#) ()
- override void [Error](#) (System.Xml.XmlException exception)
- override void [FatalError](#) (System.Xml.XmlException exception)
- virtual void [Init](#) (int startLevel)
- bool [IsDecodingAsGroup](#) ()
- void [SetComplete](#) ()
- override void [Warning](#) (System.Xml.XmlException exception)

### Protected Member Functions

- internal [Asn1XerSaxHandler](#) ()

### Protected Attributes

- bool [mConsumedStartElement](#)
- internal int [mCurrElemID](#)
- internal int [mCurrState](#)
- internal int [mLevel](#)
- internal readonly int [XERDATA](#) = 2
- internal readonly int [XEREND](#) = 3
- internal readonly int [XERINIT](#) = 0
- internal readonly int [XERSTART](#) = 1
- internal readonly int [XERUNKNOWN](#) = - 1

### Properties

- bool [Complete](#) [get]
- virtual int [State](#) [get]

#### 1.36.1 Detailed Description

This class extends the DefaultHandler SAX handler class to add items specific to ASN.1 XER encoding.

#### 1.36.2 Constructor & Destructor Documentation

##### 1.36.2.1 internal Asn1XerSaxHandler () [protected]

The default constructor creates an XER SAX parser instance.



### 1.36.3 Member Function Documentation

#### 1.36.3.1 `bool ConsumeStartElement (String namespaceURI, String localName, String qName, XmlAttributes atts)`

This method should be used in preference to invoking `StartElement` directly when a parent SAX handler is delegating to a child SAX handler.

Using this method gives the `StartElement` method the opportunity to set the `mConsumedStartElement` flag to false to signal that the given element does not belong to the group and that the group is complete. This method invokes the `StartElement` event and returns the resulting value of the `mConsumedStartElement` flag (true, unless the `StartElement` method explicitly sets it to false). If `mConsumedStartElement` is set to false, this method will invoke `SetComplete`, marking the handler complete and triggering the `EndGroup` event, if it has not already fired.

If the `StartElement` method is certain that some other element is required instead of the one given, it is preferable to throw `Asn1XmlSaxUnexpElemExc` to indicate this. Otherwise, if the given element does not belong to the group being decoded, `mConsumedStartElement` can be set false and the element ignored. It is then up to the parent SAX handler to recognize the element as part of a different group or report it as an unexpected element. The `StartElement` method should not set `mConsumedStartElement` false except when `mLevel <= mStartLevel`, since this is a precondition for `SetComplete`.

#### Returns

true if the `StartElement` method consumed the given element or false if not.

#### Exceptions

`Asn1XmlSaxUnexpElemExc` if certain that some other element is expected.

#### 1.36.3.2 `virtual void EndGroup () [virtual]`

This event method should be invoked when the group being decoded by this handler is decided to be complete. Subclasses may implement this event method to do things such as check for missing required elements. This event will be triggered, when appropriate, by `ConsumeStartElement`. Subclasses may invoke it directly when appropriate, but the preferred method is to invoke it indirectly by invoking `SetComplete`.

#### 1.36.3.3 `override void Error (System.Xml.XmlException exception) [virtual]`

This method manage when an error exception occurs in the parsing process

#### Parameters

*exception* The exception throws by the parser

#### Exceptions

`System.Xml.XmlException` The error exception

Reimplemented from [XmlSaxDefaultHandler](#).

#### 1.36.3.4 `override void FatalError (System.Xml.XmlException exception) [virtual]`

This method throws a fatal error exception.

## Parameters

*exception* The exception thrown by the parser

## Exceptions

*System.Xml.XmlException* The error exception

Reimplemented from [XmlSaxDefaultHandler](#).

### 1.36.3.5 virtual void Init (int startLevel) [virtual]

This method initializes the class member variables.

## Parameters

*startLevel* The XER level to begin

### 1.36.3.6 bool IsDecodingAsGroup ()

Return true if this SAX handler is decoding a group of elements rather than a single element (and possibly its children elements).

### 1.36.3.7 void SetComplete ()

Invoke this method to mark this SAX handler as being complete. This method will trigger the EndGroup event, if it has not already fired. This is the preferred way for a subclass to trigger the EndGroup event, rather than to invoke EndGroup directly (mainly for consistency). Subclasses should consider invoking this method in the EndElement event when either of the following conditions obtain:

- mLevel returns to 0 (indicating the group must be complete)
- The group is self-delimiting and known to be complete on that basis. This method should only be invoked when mLevel <= mStartLevel. Otherwise, the handler could not possibly be complete (note that mLevel == mStartLevel does not entail the handler is complete, because this is a normal state of affairs between elements when decoding a group).

## Exceptions

*InvalidOperationException* if mLevel != mStartLevel.

### 1.36.3.8 override void Warning (System.Xml.XmlException exception) [virtual]

This method manage when a warning exception occurs in the parsing process

## Parameters

*exception* The exception Throws by the parser

## Exceptions

*System.Xml.XmlException* The warning exception

Reimplemented from [XmlSaxDefaultHandler](#).

## 1.36.4 Member Data Documentation

### 1.36.4.1 `bool mConsumedStartElement` `[protected]`

Flag used to signal whether `startElement` actually handled the given element. See the description of method `consumeStartElement`

### 1.36.4.2 `internal int mCurrElemID` `[protected]`

Variable holds the current element ID

### 1.36.4.3 `internal int mCurrState` `[protected]`

Variable holds the current XER processing state

### 1.36.4.4 `internal int mLevel` `[protected]`

Variable holds the start and current level

### 1.36.4.5 `internal readonly int XERDATA = 2` `[protected]`

XER characters (data) state

### 1.36.4.6 `internal readonly int XEREND = 3` `[protected]`

XER end element state

### 1.36.4.7 `internal readonly int XERINIT = 0` `[protected]`

XER initialization state

### 1.36.4.8 `internal readonly int XERSTART = 1` `[protected]`

XER start element state

### 1.36.4.9 `internal readonly int XERUNKNOWN = - 1` `[protected]`

XER unknown state

## 1.36.5 Property Documentation

### 1.36.5.1 `bool Complete` `[get]`

Returns true when the SAX handler has finished decoding the group.

### 1.36.5.2 virtual int State [get]

Gets the current state of the event handler.

**Value:** current state

## 1.37 Asn1XerUtil Class Reference

### Static Public Member Functions

- static void [EncodeReal](#) ([Asn1XerEncoder](#) buffer, double value, System.String elemName)

#### 1.37.1 Detailed Description

This class contains some general purpose static utility functions for XER encoding or decoding.

#### 1.37.2 Member Function Documentation

##### 1.37.2.1 static void EncodeReal ([Asn1XerEncoder](#) *buffer*, double *value*, System.String *elemName*) [static]

This method encodes an ASN.1 real value using the XML encoding rules (XER).

##### Parameters

*buffer* Encode message buffer object

*value* Value to be encoded.

*elemName* Element name

## 1.38 Asn1XmlEncodeBuffer Class Reference

### Public Member Functions

- [Asn1XmlEncodeBuffer](#) (int sizeIncrement)
- [Asn1XmlEncodeBuffer](#) ()
- override void [BinDump](#) (System.IO.StreamWriter outs, System.String varName)
- virtual void [Copy](#) (System.String data)
- virtual void [Copy](#) (byte[] data, int off, int len)
- override void [Copy](#) (byte[] data)
- override void [Copy](#) (byte data)
- virtual void [DecrLevel](#) ()
- virtual void [EncodeAttr](#) (System.String qname, System.String data)
- virtual void [EncodeBinStrValue](#) (byte[] bits, int nbits)
- virtual void [EncodeByte](#) (byte data)
- virtual void [EncodeData](#) (System.String data)
- virtual void [EncodeDoubleValue](#) (double data, System.String elemName, System.String nsPrefix)
- virtual void [EncodeEmptyElement](#) (System.String elemName, System.String nsPrefix, bool terminate)
- virtual void [EncodeEndDocument](#) ()
- virtual void [EncodeEndElement](#) (System.String elemName, System.String nsPrefix, bool indent)
- virtual void [EncodeEndElement](#) (System.String elemName, System.String nsPrefix)
- virtual void [EncodeHexStrValue](#) (byte[] data)
- virtual void [EncodeNamedValue](#) (System.String valueName, System.String elemName, System.String nsPrefix)
- virtual void [EncodeNamedValueElement](#) (System.String valueName)
- virtual void [EncodeStartDocument](#) ()
- virtual void [EncodeStartElement](#) (System.String elemName, System.String nsPrefix, bool terminate)
- virtual void [EncodeXSIAAttrs](#) ()
- override System.IO.Stream [GetInputStream](#) ()
- virtual void [IncrLevel](#) ()
- virtual void [Indent](#) ()
- override void [Reset](#) ()
- virtual void [SetXSIAAttrs](#) (Asn1XmlXSIAAttrs data)
- override void [Write](#) (System.IO.Stream outs)

### Protected Member Functions

- internal override void [CheckSize](#) (int bytesRequired)

### Properties

- virtual byte[] [Buffer](#) [get]
- virtual bool [Canonical](#) [set]
- Asn1XmlEncodeHelper [Helper](#) [get]
- override byte[] [MsgCopy](#) [get]
- override int [MsgLength](#) [get]
- virtual int [State](#) [get, set]

## 1.38.1 Detailed Description

This class handles the encoding of ASN.1 messages as specified in the XML Encoding (non-XER) by the XML schema standard (generated by asn2xsd).

## 1.38.2 Constructor & Destructor Documentation

### 1.38.2.1 Asn1XmlEncodeBuffer ()

The default constructor creates an XML encode buffer object with the default size increment and canonical set to false.

### 1.38.2.2 Asn1XmlEncodeBuffer (int *sizeIncrement*)

The parameterized constructor creates an XML encode buffer object with size increment and canonical set to the given values.

#### Parameters

*canonical* Boolean indicating a canonical or non-canonical encoding should be produced as defined in the X.693 standard.

*sizeIncrement* The initial size in bytes of an encode buffer. If the buffer becomes full, it will be expanded by this amount. If this parameter is set to zero, the default increment will be used.

## 1.38.3 Member Function Documentation

### 1.38.3.1 override void BinDump (System.IO.StreamWriter *outs*, System.String *varName*)

This method dumps the encoded message in a human-readable format showing a bit trace of all fields to the given print output stream.

#### Parameters

*outs* Output will be written to this stream

*varName* Name of the Decoded ASN1 Type

### 1.38.3.2 internal override void CheckSize (int *bytesRequired*) [protected]

This method determines if the encode buffer can hold the requested number of bytes. If not, the buffer is expanded.

#### Parameters

*bytesRequired* Number of required bytes.

### 1.38.3.3 virtual void Copy (System.String *data*) [virtual]

This method copies a character string to the encode buffer.

#### Parameters

*data* The string value to copy

#### 1.38.3.4 virtual void Copy (byte[] data, int off, int len) [virtual]

This method copies multiple bytes to the encode buffer. It is assumed the byte are already formatted into a valid XML encoding type (for example, UTF-8).

##### Parameters

*data* Array of bytes to copy to the encode buffer

*off* The offset in array at which to begin copy.

*len* The number of bytes to copy

#### 1.38.3.5 override void Copy (byte[] data)

This method copies multiple bytes to the encode buffer. It is assumed the byte are already formatted into a valid XML encoding type (for example, UTF-8).

##### Parameters

*data* Array of bytes to copy to the encode buffer

#### 1.38.3.6 override void Copy (byte data)

This method is used to copy a single byte to the encode buffer. It first converts the byte to a hex character representation and then copies it to the output buffer.

##### Parameters

*data* The byte value to copy

#### 1.38.3.7 virtual void DecrLevel () [virtual]

This method decrements the element nesting level counter.

#### 1.38.3.8 virtual void EncodeAttr (System.String qname, System.String data) [virtual]

This method encodes an XML attribute value.

##### Parameters

*qname* Attribute qualified name.

*value* Attribute value in string form.

#### 1.38.3.9 virtual void EncodeBinStrValue (byte[] bits, int nbits) [virtual]

This method encodes XML binary string data

##### Parameters

*bits* Bit string to encode

<throws> IOException Any exception thrown by the underlying OutputStream. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>



### 1.38.3.10 virtual void EncodeByte (byte *data*) [virtual]

This method is used to encode a single byte to the encode buffer. It first converts the byte to a hex character representation and then copies it to the output buffer.

#### Parameters

*data* The byte value to copy

### 1.38.3.11 virtual void EncodeData (System.String *data*) [virtual]

This method encodes XML string data

#### Parameters

*value* String value to encode

<throws> IOException Any exception thrown by the underlying OutputStream. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>

### 1.38.3.12 virtual void EncodeDoubleValue (double *data*, System.String *elemName*, System.String *nsPrefix*) [virtual]

This method encodes an XML REAL (double) value (with start and end tags).

#### Parameters

*data* The value to be encoded.

*elemName* The name of element. If null, then start and end tags won't be encoded.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.38.3.13 virtual void EncodeEmptyElement (System.String *elemName*, System.String *nsPrefix*, bool *terminate*) [virtual]

This method encodes an XML empty element tag

#### Parameters

*elemName* The name of element.

*nsPrefix* The namespace prefix of element.

<throws> Asn1Exception Thrown, if operation is failed. </throws>

### 1.38.3.14 virtual void EncodeEndDocument () [virtual]

This method encodes standard trailer information at the end of the XML document.

**1.38.3.15 virtual void EncodeEndElement (System.String *elemName*, System.String *nsPrefix*, bool *indent*) [virtual]**

This method encodes an XML end element tag without indenting

**Parameters**

*elemName* The name of element.

<throws> Asn1Exception Thrown, if operation is failed. </throws>

**1.38.3.16 virtual void EncodeEndElement (System.String *elemName*, System.String *nsPrefix*) [virtual]**

This method encodes an XML end element tag

**Parameters**

*elemName* The name of element, as String.

**1.38.3.17 virtual void EncodeHexStrValue (byte[] *data*) [virtual]**

This method encodes XML hexadecimal string data

**Parameters**

*data* Data to encode

<throws> IOException Any exception thrown by the underlying OutputStream. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>

**1.38.3.18 virtual void EncodeNamedValue (System.String *valueName*, System.String *elemName*, System.String *nsPrefix*) [virtual]**

This method encodes an XML named value (with start and end tags)

**1.38.3.19 virtual void EncodeNamedValueElement (System.String *valueName*) [virtual]**

This method encodes an XML named value element tag

**Parameters**

*valueName* The named value, as String.

**Exceptions**

*Asn1Exception* Thrown, if operation is failed.

**1.38.3.20 virtual void EncodeStartDocument () [virtual]**

This method encodes standard header information at the beginning of the XML document.

**1.38.3.21 virtual void EncodeStartElement (System.String *elemName*, System.String *nsPrefix*, bool *terminate*) [virtual]**

This method encodes an XML start element tag.

**Parameters**

*elemName* The name of element.

*nsPrefix* The namespace prefix of element.

<throws> Asn1Exception Thrown, if operation is failed. </throws>

**1.38.3.22 virtual void EncodeXSIAattrs () [virtual]**

This method encodes XSI attributes.

**1.38.3.23 override System.IO.Stream GetInputStream ()**

This method returns an input stream object reference to the message buffer contents (i.e. the encoded data). If an output stream was selected as the output method, this method returns null.

**Returns**

Input stream object reference

**1.38.3.24 virtual void IncrLevel () [virtual]**

This method increments the element nesting level counter.

**1.38.3.25 virtual void Indent () [virtual]**

This methods indents by adding a new-line followed by whitespace corresponding to the current nesting level to the encode buffer.

**1.38.3.26 override void Reset ()**

This method resets the buffer to allow a new record to be encoded into it. Any previously encoded data is lost.

**1.38.3.27 virtual void SetXSIAattrs (Asn1XmlXSIAattrs *data*) [virtual]**

This method sets the XSI attributes object to the given value.

**Parameters**

*value* XSI attributes object

### 1.38.3.28 override void Write (System.IO.Stream *outs*)

This method writes the encoded record to the given output stream.

#### Parameters

*outs* Output stream to which record is to be written

## 1.38.4 Property Documentation

### 1.38.4.1 virtual byte [] Buffer [get]

Gets a reference of the byte buffer used to hold the encoded message.

**Value:** byte array containing encoded message

### 1.38.4.2 virtual bool Canonical [set]

Sets the canonical encoding rule.

**Value:** `true` if canonical encoding; otherwise `false`.

### 1.38.4.3 Asn1XmlEncodeHelper Helper [get]

Gets the encoding helper object.

### 1.38.4.4 override byte [] MsgCopy [get]

Gets the copy of the byte buffer used to hold the encoded message.

**Value:** byte array containing encoded message

### 1.38.4.5 override int MsgLength [get]

Gets the length (in bytes) of the encoded message component.

**Value:** length of encoded message component

### 1.38.4.6 virtual int State [get, set]

Sets the state of the buffer.

**Value:** buffer stat

## 1.39 Asn1XmlOutputStream Class Reference

### Public Member Functions

- [Asn1XmlOutputStream](#) (System.IO.Stream os, bool canonical, int bufSize)
- [Asn1XmlOutputStream](#) (System.IO.Stream os, int bufSize)
- [Asn1XmlOutputStream](#) (System.IO.Stream os)
- virtual void [Copy](#) (System.String data)
- virtual void [Copy](#) (byte[] data, int off, int len)
- virtual void [Copy](#) (byte[] data)
- virtual void [Copy](#) (byte data)
- virtual void [DecrLevel](#) ()
- virtual void [EncodeAttr](#) (System.String qname, System.String data)
- virtual void [EncodeBinStrValue](#) (byte[] bits, int nbits)
- virtual void [EncodeByte](#) (byte data)
- virtual void [EncodeData](#) (System.String data)
- virtual void [EncodeDoubleValue](#) (double data, System.String elemName, System.String nsPrefix)
- virtual void [EncodeEmptyElement](#) (System.String elemName, System.String nsPrefix, bool terminate)
- virtual void [EncodeEndDocument](#) ()
- virtual void [EncodeEndElement](#) (System.String elemName, System.String nsPrefix, bool indent)
- virtual void [EncodeEndElement](#) (System.String elemName, System.String nsPrefix)
- virtual void [EncodeHexStrValue](#) (byte[] data)
- virtual void [EncodeNamedValue](#) (System.String valueName, System.String elemName, System.String nsPrefix)
- virtual void [EncodeNamedValueElement](#) (System.String valueName)
- virtual void [EncodeStartDocument](#) ()
- virtual void [EncodeStartElement](#) (System.String elemName, System.String nsPrefix, bool terminate)
- virtual void [EncodeXSIAAttrs](#) ()
- virtual void [IncrLevel](#) ()
- virtual void [Indent](#) ()
- virtual void [SetXSIAAttrs](#) (Asn1XmlXSIAAttrs data)
- virtual void [Write](#) (System.String data)

### Properties

- virtual bool [Canonical](#) [set]
- virtual Asn1XmlEncodeHelper [Helper](#) [get]
- virtual int [State](#) [get, set]

#### 1.39.1 Detailed Description

This class implements the output stream to encode ASN.1 messages as specified in the XML Encoding by the XML schema standard (generated by asn2xsd). A reference to an object of this type is passed to each of the ASN.1 type encode methods involved in encoding a particular message type.

## 1.39.2 Constructor & Destructor Documentation

### 1.39.2.1 Asn1XmlOutputStream (System.IO.Stream *os*)

This constructor creates a buffered XML output stream object with default size of buffer. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

*os* The underlying System.IO.Stream object.

### 1.39.2.2 Asn1XmlOutputStream (System.IO.Stream *os*, int *bufSize*)

This constructor creates a buffered XML output stream object. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

*os* The underlying System.IO.Stream object.

*bufSize* The buffer size. If it is 0 then the output stream is used as unbuffered.

### 1.39.2.3 Asn1XmlOutputStream (System.IO.Stream *os*, bool *canonical*, int *bufSize*)

This constructor creates a buffered XML output stream object. Whenever the buffer becomes full, the buffer will be flushed to the stream.

#### Parameters

*os* The underlying System.IO.Stream object.

*canonical* Boolean indicating a canonical or non-canonical encoding should be produced as defined in the X.693 standard.

*bufSize* The buffer size. If it is 0 then the output stream is used as unbuffered.

## 1.39.3 Member Function Documentation

### 1.39.3.1 virtual void Copy (System.String *data*) [virtual]

This method copies a character string to the output stream.

#### Parameters

*value* The string value to copy

<throws> IOException Any exception thrown by the underlying OutputStream. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>

### 1.39.3.2 virtual void Copy (byte[] *data*, int *off*, int *len*) [virtual]

This method copies multiple bytes to the output stream. It is assumed the byte are already formatted into a valid XML encoding type (for example, UTF-8).

## Parameters

*value* Array of bytes to copy to the output stream

*off* Starting offset in array

*len* The length to be encoded

<throws> IOException Any exception thrown by the underlying OutputStream. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>

### 1.39.3.3 virtual void Copy (byte[] data) [virtual]

This method copies multiple bytes to the output stream. It is assumed the byte are already formatted into a valid XML encoding type (for example, UTF-8).

## Parameters

*value* Array of bytes to copy to the output stream

<throws> IOException Any exception thrown by the underlying OutputStream. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>

### 1.39.3.4 virtual void Copy (byte data) [virtual]

This method is used to copy a single byte to the output stream. It first converts the byte to a hex character representation and then copies it to the output buffer.

## Parameters

*value* The byte value to copy

<throws> IOException Any exception thrown by the underlying OutputStream. </throws>

### 1.39.3.5 virtual void DecrLevel () [virtual]

This method decrements the element nesting level counter.

### 1.39.3.6 virtual void EncodeAttr (System.String qname, System.String data) [virtual]

This method encodes an XML attribute value.

## Parameters

*qname* Attribute qualified name.

*value* Attribute value in string form.

### 1.39.3.7 virtual void EncodeBinStrValue (byte[] bits, int nbits) [virtual]

This method encodes XML binary string data

## Parameters

*bits* Bit string to encode

<throws> IOException Any exception thrown by the underlying OutputStream. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>

### 1.39.3.8 virtual void EncodeByte (byte data) [virtual]

This method is used to encode a single byte to the output stream. It first converts the byte to a hex character representation and then copies it to the output buffer.

#### Parameters

*value* The byte value to copy

<throws> IOException Any exception thrown by the underlying OutputStream. </throws>

### 1.39.3.9 virtual void EncodeData (System.String data) [virtual]

This method encodes XML string data

#### Parameters

*value* String value to encode

<throws> IOException Any exception thrown by the underlying OutputStream. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>

### 1.39.3.10 virtual void EncodeDoubleValue (double data, System.String elemName, System.String nsPrefix) [virtual]

This method encodes an XML REAL (double) value (with start and end tags).

#### Parameters

*data* The value to be encoded.

*elemName* The name of element. If null, then start and end tags won't be encoded.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.39.3.11 virtual void EncodeEmptyElement (System.String elemName, System.String nsPrefix, bool terminate) [virtual]

This method encodes an XML empty element tag

#### Parameters

*elemName* The name of element.

*nsPrefix* The namespace prefix of element.

<throws> Asn1Exception Thrown, if operation is failed. </throws>



### 1.39.3.12 virtual void EncodeEndDocument () [virtual]

This method encodes standard trailer information at the end of the XML document.

### 1.39.3.13 virtual void EncodeEndElement (System.String *elemName*, System.String *nsPrefix*, bool *indent*) [virtual]

This method encodes an XML end element tag without indenting

#### Parameters

*elemName* The name of element.

<throws> Asn1Exception Thrown, if operation is failed. </throws>

### 1.39.3.14 virtual void EncodeEndElement (System.String *elemName*, System.String *nsPrefix*) [virtual]

This method encodes an XML end element tag

#### Parameters

*elemName* The name of element, as String.

### 1.39.3.15 virtual void EncodeHexStrValue (byte[] *data*) [virtual]

This method encodes XML hexadecimal string data

#### Parameters

*data* Data to encode

<throws> IOException Any exception thrown by the underlying OutputStream. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>

### 1.39.3.16 virtual void EncodeNamedValue (System.String *valueName*, System.String *elemName*, System.String *nsPrefix*) [virtual]

This method encodes an XML named value (with start and end tags)

#### Parameters

*valueName* The name of value.

*elemName* The name of element.

<throws> IOException If I/O error occurs. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>

### 1.39.3.17 virtual void EncodeNamedValueElement (System.String *valueName*) [virtual]

This method encodes an XML named value element tag

#### Parameters

*valueName* The named value, as String.

#### Exceptions

*Asn1Exception* Thrown, if operation is failed.

### 1.39.3.18 virtual void EncodeStartDocument () [virtual]

This method encodes standard header information at the beginning of the XML document.

### 1.39.3.19 virtual void EncodeStartElement (System.String *elemName*, System.String *nsPrefix*, bool *terminate*) [virtual]

This method encodes an XML start element tag.

#### Parameters

*elemName* The name of element.

*nsPrefix* The namespace prefix of element.

<throws> *Asn1Exception* Thrown, if operation is failed. </throws>

### 1.39.3.20 virtual void EncodeXSIAttrs () [virtual]

This method encodes XSI attributes.

### 1.39.3.21 virtual void IncrLevel () [virtual]

This method increments the element nesting level counter.

### 1.39.3.22 virtual void Indent () [virtual]

This methods indents by adding a new-line followed by whitespace corresponding to the current nesting level to the output stream.

<throws> *IOException* Any exception thrown by the underlying *OutputStream*. </throws> <throws> *Asn1Exception* Thrown, if operation is failed. </throws>

### 1.39.3.23 virtual void SetXSIAttrs (Asn1XmlXSIAttrs *data*) [virtual]

This method sets the XSI attributes object to the given value.

#### Parameters

*value* XSI attributes object

### 1.39.3.24 virtual void Write (System.String data) [virtual]

This method copies a character string to the output stream.

#### Parameters

*value* The string value to copy

<throws> IOException Any exception thrown by the underlying OutputStream. </throws> <throws> Asn1Exception Thrown, if operation is failed. </throws>

## 1.39.4 Property Documentation

### 1.39.4.1 virtual bool Canonical [set]

Sets the canonical encoding rule.

**Value:** true if canonical encoding; otherwise false.

### 1.39.4.2 virtual Asn1XmlEncodeHelper Helper [get]

Gets the encoding helper object.

**Value:** The helper object.

### 1.39.4.3 virtual int State [get, set]

Sets the state of the buffer.

**Value:** buffer stat

## 1.40 Asn1XmlUtil Class Reference

### Static Public Member Functions

- static string [CaptureElement](#) (System.Xml.XmlReader reader, bool contentOnly, bool injectNsDecls)
- static void [EncodeDouble](#) (Asn1XmlEncoder buffer, double data)
- static void [EncodeDouble](#) (Asn1XmlEncoder buffer, double data, System.String elemName, System.String nsPrefix)
- static void [EncodeNSAttrs](#) (Asn1XmlEncoder buffer, Asn1XmlNamespace[] nsArray)
- static double [GetMinusZero](#) ()
- static string [GetTextContent](#) (System.Xml.XmlReader reader)
- static System.String [GetXMLString](#) (System.String data)
- static bool [IsMinusZero](#) (double value)
- static void [KeepNullsInString](#) (bool keep)
- static String[] [TokenizeXsdList](#) (String listValue)

### 1.40.1 Detailed Description

This class contains some general purpose static utility functions for XML encoding or decoding.

### 1.40.2 Member Function Documentation

#### 1.40.2.1 static string CaptureElement (System.Xml.XmlReader *reader*, bool *contentOnly*, bool *injectNsDecls*) [static]

Capture the XML text for an element, returning it in a string object. Optionally, this method can capture the element's content only.

PRE: The reader is positioned on the start tag of the element to be captured, call it E. POST: The reader is positioned on the event following element E.

#### Parameters

*contentOnly* if TRUE, only capture the content of the current element. Otherwise, captures the current element's tags, namespace declarations, and attributes, as well as the content.

*injectNsDecls* if TRUE, the outermost element(s) should include namespace declarations for prefixes used by those elements but not declared.

#### 1.40.2.2 static void EncodeDouble (Asn1XmlEncoder *buffer*, double *data*) [static]

This method encodes an ASN.1 real value using the XML encoding (non-XER).

#### Parameters

*buffer* Encode message buffer object

*value* Value to be encoded.

**1.40.2.3** `static void EncodeDouble (Asn1XmlEncoder buffer, double data, System.String elemName, System.String nsPrefix) [static]`

This method encodes an ASN.1 real value using the XML encoding (non-XER).

**Parameters**

- buffer* Encode message buffer object
- value* Value to be encoded.
- elemName* Element name
- nsPrefix* Element namespace prefix value

**1.40.2.4** `static void EncodeNSAttrs (Asn1XmlEncoder buffer, Asn1XmlNamespace[] nsArray) [static]`

This method encodes XML namespace attributes in the form 'xmlns[:prefix]="uri"'.

**Parameters**

- nsArray* Array of XML namespace prefix/URI mappings.

**1.40.2.5** `static double GetMinusZero () [static]`

This method returns double value for "minus zero" (-0) special XML value.

**Returns**

- double value for "-0".

**1.40.2.6** `static string GetTextContent (System.Xml.XmlReader reader) [static]`

Return the current text node and subsequent text content until an EndElement is found.

This will throw an exception if any Element nodes are encountered. PRE: The reader is positioned on a Text or CDATA event. POST: The reader is positioned just past the closing EndElement.

**1.40.2.7** `static System.String GetXMLString (System.String data) [static]`

This method will convert the given string value into XML character content by escaping special characters in the sting such as ampersand (&), left angle bracket (>), etc.

**Parameters**

- data* String to convert

**Returns**

- Converted string value

#### 1.40.2.8 **static bool IsMinusZero (double *value*) [static]**

This method will return true, if value is "minus zero" (-0) special XML value.

##### **Parameters**

*value* value to test

##### **Returns**

true, if this value is "-0".

#### 1.40.2.9 **static void KeepNullsInString (bool *keep*) [static]**

This method allows users to toggle the output of a null entity code in XML strings. Null bytes are not permitted in any XML document, but are permissible in ASN.1 strings. When converting, users may elect to retain null bytes as entities (&x0;) by passing

true

to this function. By default, null bytes are dropped.

##### **Parameters**

*keep* Boolean switch to keep or ignore null bytes.

#### 1.40.2.10 **static String [] TokenizeXsdList (String *listValue*) [static]**

Return an array of strings representing the (lexical) values of an xsd:list

##### **Parameters**

*listValue* the lexical value of the xsd:list. It need not have whitespace collapse applied yet.

##### **Returns**

array of lexical values, one per value in the listValue. No empty strings will appear in the array.

## 1.41 XmlAttribute Class Reference

### Public Member Functions

- [XmlAttribute](#) (System.String Uri, System.String Lname, System.String Qname, System.String Type, System.String Value)

### Public Attributes

- System.String [att\\_fullName](#)
- System.String [att\\_localName](#)
- System.String [att\\_type](#)
- System.String [att\\_URI](#)
- System.String [att\\_value](#)

### 1.41.1 Detailed Description

This class is created to save the information of each attributes in the [XmlAttributes](#).

### 1.41.2 Constructor & Destructor Documentation

#### 1.41.2.1 XmlAttribute (System.String Uri, System.String Lname, System.String Qname, System.String Type, System.String Value)

This is the constructor of the [XmlAttribute](#)

#### Parameters

*Uri* The namespace URI of the attribute

*Lname* The local name of the attribute

*Qname* The long(Qualify) name of attribute

*Type* The type of the attribute

*Value* The value of the attribute

### 1.41.3 Member Data Documentation

#### 1.41.3.1 System.String att\_fullName

Variable holds attribte full name (namespace + local name)

#### 1.41.3.2 System.String att\_localName

Variable holds attribte local name

#### 1.41.3.3 System.String att\_type

Variable holds attribte type

#### **1.41.3.4 System.String att\_URI**

Variable holds attribute namespace

#### **1.41.3.5 System.String att\_value**

Variable holds attribute value



## 1.42 XmlAttributes Class Reference

### Classes

- class [XmlAttribute](#)

### Public Member Functions

- virtual void [Add](#) (System.String Uri, System.String Lname, System.String Qname, System.String Type, System.String Value)
- virtual void [Clear](#) ()
- virtual System.String [GetFullName](#) (int index)
- virtual int [GetIndex](#) (System.String Uri, System.String Lname)
- virtual int [GetIndex](#) (System.String Qname)
- virtual int [GetLength](#) ()
- virtual System.String [GetLocalName](#) (int index)
- virtual System.String [GetQName](#) (int index)
- virtual System.String [GetType](#) (System.String Uri, System.String Lname)
- virtual System.String [GetType](#) (System.String Qname)
- virtual System.String [GetType](#) (int index)
- virtual System.String [GetURI](#) (int index)
- virtual System.String [GetValue](#) (System.String Uri, System.String Lname)
- virtual System.String [GetValue](#) (System.String Qname)
- virtual System.String [GetValue](#) (int index)
- virtual void [RemoveAttribute](#) (System.String indexName)
- virtual void [RemoveAttribute](#) (int index)
- virtual void [SetAttribute](#) (int index, System.String Uri, System.String Lname, System.String Qname, System.String Type, System.String Value)
- virtual void [SetAttributes](#) ([XmlAttribute](#) Source)
- virtual void [SetFullName](#) (int index, System.String FullName)
- virtual void [SetLocalName](#) (int index, System.String LocalName)
- virtual void [SetType](#) (int index, System.String Type)
- virtual void [SetURI](#) (int index, System.String URI)
- virtual void [SetValue](#) (int index, System.String Value)
- [XmlAttribute](#)s ([XmlAttribute](#)s arrayList)
- [XmlAttribute](#)s ()

### 1.42.1 Detailed Description

This class will manage all the parsing operations emulating the SAX parser behavior

### 1.42.2 Constructor & Destructor Documentation

#### 1.42.2.1 [XmlAttribute](#)s ()

Builds a new instance of [XmlAttribute](#)s.

### 1.42.2.2 `XmlAttributes` (`XmlAttributes` *arrayList*)

Creates a new instance of `XmlAttributes` from an `ArrayList` of `XmlAttribute` class.

#### Parameters

*arrayList* An `ArrayList` of `XmlAttribute` class instances.

#### Returns

A new instance of `XmlAttributes`

### 1.42.3 Member Function Documentation

#### 1.42.3.1 `virtual void Add (System.String Uri, System.String Lname, System.String Qname, System.String Type, System.String Value) [virtual]`

Adds a new attribute element to the given `XmlAttributes` instance.

#### Parameters

*Uri* The Uri of the attribute to be added.

*Lname* The Local name of the attribute to be added.

*Qname* The Long(qualify) name of the attribute to be added.

*Type* The type of the attribute to be added.

*Value* The value of the attribute to be added.

#### 1.42.3.2 `virtual void Clear () [virtual]`

Clears the list of attributes in the given `AttributesSupport` instance.

#### 1.42.3.3 `virtual System.String GetFullName (int index) [virtual]`

Returns the qualified name of the attribute indicated by the given index.

#### Parameters

*index* The attribute index.

#### Returns

The qualified name or empty string if the index is out of bounds.

#### 1.42.3.4 `virtual int GetIndex (System.String Uri, System.String Lname) [virtual]`

Obtains the index of an attribute of the `AttributeSupport` from its namespace URI and its localname.

#### Parameters

*Uri* The namespace URI of the attribute to search.

*Lname* The local name of the attribute to search.

#### Returns

An zero-based index of the attribute if it is found, otherwise it returns -1.

#### 1.42.3.5 virtual int GetIndex (System.String *Qname*) [virtual]

Obtains the index of an attribute of the AttributeSupport from its qualified (long) name.

##### Parameters

*Qname* The qualified name of the attribute to search.

##### Returns

An zero-based index of the attribute if it is found, otherwise it returns -1.

#### 1.42.3.6 virtual int GetLength () [virtual]

Returns the number of attributes saved in the [XmlAttributes](#) instance.

##### Returns

The number of elements in the given [XmlAttributes](#) instance.

#### 1.42.3.7 virtual System.String GetLocalName (int *index*) [virtual]

Returns the local name of the attribute in the given [XmlAttributes](#) instance that indicates the given index.

##### Parameters

*index* The attribute index.

##### Returns

The local name of the attribute indicated by the index or null if the index is out of bounds.

#### 1.42.3.8 virtual System.String GetQName (int *index*) [virtual]

Returns the qualified name of the attribute indicated by the given index. This is an alias for GetFullName.

##### Parameters

*index*

##### Returns

The qualified name or empty string if the index is out of bounds.

#### 1.42.3.9 virtual System.String GetType (System.String *Uri*, System.String *Lname*) [virtual]

Returns the type of the Attribute that match with the given namespace URI and local name.

##### Parameters

*Uri* The namespace URI of the attribute to search.

*Lname* The local name of the attribute to search.

##### Returns

The type of the attribute if it exist otherwise returns null.

#### **1.42.3.10 virtual System.String GetType (System.String *Qname*) [virtual]**

Returns the type of the Attribute that match with the given qualified name.

##### **Parameters**

*Qname* The qualified name of the attribute to search.

##### **Returns**

The type of the attribute if it exist otherwise returns null.

#### **1.42.3.11 virtual System.String GetType (int *index*) [virtual]**

Returns the type of the attribute in the given [XmlAttributes](#) instance that indicates the given index.

##### **Parameters**

*index* The attribute index.

##### **Returns**

The type of the attribute indicated by the index or null if the index is out of bounds.

#### **1.42.3.12 virtual System.String GetURI (int *index*) [virtual]**

Returns the namespace URI of the attribute in the given [XmlAttributes](#) instance that indicates the given index.

##### **Parameters**

*index* The attribute index.

##### **Returns**

The namespace URI of the attribute indicated by the index or null if the index is out of bounds.

#### **1.42.3.13 virtual System.String GetValue (System.String *Uri*, System.String *Lname*) [virtual]**

Returns the value of the Attribute that match with the given namespace URI and local name.

##### **Parameters**

*Uri* The namespace URI of the attribute to search.

*Lname* The local name of the attribute to search.

##### **Returns**

The value of the attribute if it exist otherwise returns null.

#### 1.42.3.14 virtual System.String GetValue (System.String *Qname*) [virtual]

Returns the value of the Attribute that match with the given qualified name.

##### Parameters

*Qname* The qualified name of the attribute to search.

##### Returns

The value of the attribute if it exist otherwise returns null.

#### 1.42.3.15 virtual System.String GetValue (int *index*) [virtual]

Returns the value of the attribute in the given [XmlAttributes](#) instance that indicates the given index.

##### Parameters

*index* The attribute index.

##### Returns

The value of the attribute indicated by the index or null if the index is out of bounds.

#### 1.42.3.16 virtual void RemoveAttribute (System.String *indexName*) [virtual]

This method eliminates the [XmlAttribute](#) instance in the specified index.

##### Parameters

*indexName* The index name of the attribute.

#### 1.42.3.17 virtual void RemoveAttribute (int *index*) [virtual]

This method eliminates the [XmlAttribute](#) instance at the specified index.

##### Parameters

*index* The index of the attribute.

#### 1.42.3.18 virtual void SetAttribute (int *index*, System.String *Uri*, System.String *Lname*, System.String *Qname*, System.String *Type*, System.String *Value*) [virtual]

Replaces an [XmlAttribute](#) in the given [XmlAttributes](#) instance.

##### Parameters

*index* The index of the attribute.

*Uri* The namespace URI of the new [XmlAttribute](#).

*Lname* The local name of the new [XmlAttribute](#).

*Qname* The namespace URI of the new [XmlAttribute](#).

*Type* The type of the new [XmlAttribute](#).

*Value* The value of the new [XmlAttribute](#).

### **1.42.3.19 virtual void SetAttributes (XmlAttribute Source) [virtual]**

Replaces all the list of [XmlAttribute](#) of the given [XmlAttributes](#) instance.

#### **Parameters**

*Source* The source [XmlAttributes](#) instance.

### **1.42.3.20 virtual void SetFullName (int index, System.String FullName) [virtual]**

Modifies the qualified name of the attribute in the given [XmlAttributes](#) instance.

#### **Parameters**

*index* The attribute index.

*FullName* The new qualified name for the attribute.

### **1.42.3.21 virtual void SetLocalName (int index, System.String LocalName) [virtual]**

Modifies the local name of the attribute in the given [XmlAttributes](#) instance.

#### **Parameters**

*index* The attribute index.

*LocalName* The new Local name for the attribute.

### **1.42.3.22 virtual void SetType (int index, System.String Type) [virtual]**

Modifies the type of the attribute in the given [XmlAttributes](#) instance.

#### **Parameters**

*index* The attribute index.

*Type* The new type for the attribute.

### **1.42.3.23 virtual void SetURI (int index, System.String URI) [virtual]**

Modifies the namespace URI of the attribute in the given [XmlAttributes](#) instance.

#### **Parameters**

*index* The attribute index.

*URI* The new namespace URI for the attribute.

### **1.42.3.24 virtual void SetValue (int index, System.String Value) [virtual]**

Modifies the value of the attribute in the given [XmlAttributes](#) instance.

#### **Parameters**

*index* The attribute index.

*Value* The new value for the attribute.

## 1.43 XmlSaxContentHandler Interface Reference

Inherited by [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

### Public Member Functions

- void [Characters](#) (char[] ch, int start, int length)
- void [EndDocument](#) ()
- void [EndElement](#) (System.String namespaceURI, System.String localName, System.String qName)
- void [EndPrefixMapping](#) (System.String prefix)
- void [IgnorableWhitespace](#) (char[] Ch, int Start, int Length)
- void [ProcessingInstruction](#) (System.String target, System.String data)
- void [SetDocumentLocator](#) ([XmlSaxLocator](#) locator)
- void [SkippedEntity](#) (System.String name)
- void [StartDocument](#) ()
- void [StartElement](#) (System.String namespaceURI, System.String localName, System.String qName, [XmlAttribute](#) atts)
- void [StartPrefixMapping](#) (System.String prefix, System.String uri)

### 1.43.1 Detailed Description

This interface will manage the Content events of a XML document.

### 1.43.2 Member Function Documentation

#### 1.43.2.1 void Characters (char[] *ch*, int *start*, int *length*)

This method manage the notification when Characters elements were found.

##### Parameters

*ch* The array with the characters found.

*start* The index of the first position of the characters found.

*length* Specify how many characters must be read from the array.

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

#### 1.43.2.2 void EndDocument ()

This method manage the notification when the end document node were found.

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

#### 1.43.2.3 void EndElement (System.String *namespaceURI*, System.String *localName*, System.String *qName*)

This method manage the notification when the end element node was found.

##### Parameters

*namespaceURI* The namespace URI of the element.

*localName* The local name of the element.

*qName* The long (qualified) name of the element.

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

#### 1.43.2.4 void EndPrefixMapping (System.String *prefix*)

This method manage the event when an area of expecific URI prefix was ended.

##### Parameters

*prefix* The prefix that ends.

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

#### 1.43.2.5 void IgnorableWhitespace (char[] *Ch*, int *Start*, int *Length*)

This method manage the event when a ignorable whitespace node was found.

##### Parameters

*Ch* The array with the ignorable whitespaces.

*Start* The index in the array with the ignorable whitespace.

*Length* The length of the whitespaces.

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

#### 1.43.2.6 void ProcessingInstruction (System.String *target*, System.String *data*)

This method manage the event when a processing instruction was found.

##### Parameters

*target* The processing instruction target.

*data* The processing instruction data.

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

#### 1.43.2.7 void SetDocumentLocator (XmlSaxLocator *locator*)

This method is not supported, it is included for compatibility.

##### Parameters

*locator* A [XmlSaxLocator](#) object that can return the location of any events into the XML document

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).



#### 1.43.2.8 void SkippedEntity (System.String name)

This method manage the event when a skipped entity was found.

##### Parameters

*name* The name of the skipped entity.

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

#### 1.43.2.9 void StartDocument ()

This method manage the event when a start document node was found.

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

#### 1.43.2.10 void StartElement (System.String namespaceURI, System.String localName, System.String qName, XmlAttributes atts)

This method manage the event when a start element node was found.

##### Parameters

*namespaceURI* The namespace uri of the element tag.

*localName* The local name of the element.

*qName* The long (qualified) name of the element.

*atts* The list of attributes of the element.

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

#### 1.43.2.11 void StartPrefixMapping (System.String prefix, System.String uri)

This methods indicates the start of a prefix area in the XML document.

##### Parameters

*prefix* The prefix of the area.

*uri* The namespace URI of the prefix area.

Implemented in [XmlSaxDefaultHandler](#), and [XmlSaxParserAdapter](#).

## 1.44 XmlSaxDefaultHandler Class Reference

Inherits [Com::Objsys::Asn1::Runtime::XmlSaxContentHandler](#), [Com::Objsys::Asn1::Runtime::XmlSaxErrorHandler](#), and [Com::Objsys::Asn1::Runtime::XmlSaxEntityResolver](#).

Inherited by [Asn1XerSaxHandler](#).

### Public Member Functions

- virtual void [Characters](#) (char[ ] ch, int start, int length)
- virtual void [EndDocument](#) ()
- virtual void [EndElement](#) (System.String ns, System.String localName, System.String qName)
- virtual void [EndPrefixMapping](#) (System.String prefix)
- virtual void [Error](#) (System.Xml.XmlException exception)
- virtual void [FatalError](#) (System.Xml.XmlException exception)
- virtual void [IgnorableWhitespace](#) (char[ ] chars, int start, int length)
- virtual void [ProcessingInstruction](#) (System.String target, System.String data)
- virtual [XmlSource ResolveEntity](#) (System.String publicId, System.String systemId)
- virtual void [SetDocumentLocator](#) ([XmlSaxLocator](#) locator)
- virtual void [SkippedEntity](#) (System.String name)
- virtual void [StartDocument](#) ()
- virtual void [StartElement](#) (System.String ns, System.String localName, System.String qName, [XmlAttributes](#) attributes)
- virtual void [StartPrefixMapping](#) (System.String prefix, System.String uri)
- virtual void [Warning](#) (System.Xml.XmlException exception)

### 1.44.1 Detailed Description

This class provides the base implementation for the management of XML documents parsing.

### 1.44.2 Member Function Documentation

#### 1.44.2.1 virtual void Characters (char[ ] ch, int start, int length) [virtual]

This method manage the notification when Characters element were found.

#### Parameters

*ch* The array with the characters founds

*start* The index of the first position of the characters found

*length* Specify how many characters must be read from the array

Implements [XmlSaxContentHandler](#).

#### 1.44.2.2 virtual void EndDocument () [virtual]

This method manage the notification when the end document node were found

Implements [XmlSaxContentHandler](#).

**1.44.2.3 virtual void EndElement (System.String ns, System.String localName, System.String qName) [virtual]**

This method manage the notification when the end element node were found

**Parameters**

*ns* The namespace of the element

*localName* The local name of the element

*qName* The long name (qualify name) of the element

Implements [XmlSaxContentHandler](#).

**1.44.2.4 virtual void EndPrefixMapping (System.String prefix) [virtual]**

This method manage the event when an area of expecific URI prefix was ended.

**Parameters**

*prefix* The prefix that ends

Implements [XmlSaxContentHandler](#).

**1.44.2.5 virtual void Error (System.Xml.XmlException exception) [virtual]**

This method manage when an error exception occurs in the parsing process

**Parameters**

*exception* The exception thrown by the parser

Implements [XmlSaxErrorHandler](#).

Reimplemented in [Asn1XerSaxHandler](#).

**1.44.2.6 virtual void FatalError (System.Xml.XmlException exception) [virtual]**

This method manage when a fatal error exception occurs in the parsing process

**Parameters**

*exception* The exception Thrown by the parser

Implements [XmlSaxErrorHandler](#).

Reimplemented in [Asn1XerSaxHandler](#).

**1.44.2.7 virtual void IgnorableWhitespace (char[] chars, int start, int length) [virtual]**

This method manage the event when a ignorable whitespace node were found

**Parameters**

*chars* The array with the ignorable whitespaces

*start* The array offset at the ignorable whitespace

*length* The length of the whitespaces

Implements [XmlSaxContentHandler](#).

#### 1.44.2.8 virtual void ProcessingInstruction (System.String *target*, System.String *data*) [virtual]

This method manage the event when a processing instruction were found

##### Parameters

*target* The processing instruction target

*data* The processing instruction data

Implements [XmlSaxContentHandler](#).

#### 1.44.2.9 virtual XmlSource ResolveEntity (System.String *publicId*, System.String *systemId*) [virtual]

Allow the application to resolve external entities.

##### Parameters

*publicId* The public identifier of the external entity being referenced, or null if none was supplied.

*systemId* The system identifier of the external entity being referenced.

##### Returns

A XmlSourceSupport object describing the new input source, or null to request that the parser open a regular URI connection to the system identifier.

Implements [XmlSaxEntityResolver](#).

#### 1.44.2.10 virtual void SetDocumentLocator (XmlSaxLocator *locator*) [virtual]

This method is not supported, is include for compatibility

##### Parameters

*locator* A [XmlSaxLocator](#) object that can return the location of any events into the XML document

Implements [XmlSaxContentHandler](#).

#### 1.44.2.11 virtual void SkippedEntity (System.String *name*) [virtual]

This method manage the event when a skipped entity were found

##### Parameters

*name* The name of the skipped entity

Implements [XmlSaxContentHandler](#).

#### 1.44.2.12 virtual void StartDocument () [virtual]

This method manage the event when a start document node were found

Implements [XmlSaxContentHandler](#).

#### 1.44.2.13 virtual void StartElement (System.String *ns*, System.String *localName*, System.String *qName*, XmlAttributes *attributes*) [virtual]

This method manage the event when a start element node were found

##### Parameters

- ns* The namespace uri of the element tag
- localName* The local name of the element
- qName* The Qualify (long) name of the element
- attributes* The list of attributes of the element

Implements [XmlSaxContentHandler](#).

#### 1.44.2.14 virtual void StartPrefixMapping (System.String *prefix*, System.String *uri*) [virtual]

This methods indicates the start of a prefix area in the XML document.

##### Parameters

- prefix* The prefix of the area
- uri* The namespace uri of the prefix area

Implements [XmlSaxContentHandler](#).

#### 1.44.2.15 virtual void Warning (System.Xml.XmlException *exception*) [virtual]

This method manage when a warning exception occurs in the parsing process

##### Parameters

- exception* The exception Thrown by the parser

Implements [XmlSaxErrorHandler](#).

Reimplemented in [Asn1XerSaxHandler](#).

## 1.45 XmlSaxEntityResolver Interface Reference

Inherited by [XmlSaxDefaultHandler](#).

### Public Member Functions

- [XmlSource ResolveEntity](#) (System.String publicId, System.String systemId)

### 1.45.1 Detailed Description

Basic interface for resolving entities.

### 1.45.2 Member Function Documentation

#### 1.45.2.1 XmlSource ResolveEntity (System.String *publicId*, System.String *systemId*)

Allow the application to resolve external entities.

#### Parameters

*publicId* The public identifier of the external entity being referenced, or null if none was supplied.

*systemId* The system identifier of the external entity being referenced.

#### Returns

A XmlSourceSupport object describing the new input source, or null to request that the parser open a regular URI connection to the system identifier.

Implemented in [XmlSaxDefaultHandler](#).

## 1.46 XmlSaxErrorHandler Interface Reference

Inherited by [XmlSaxDefaultHandler](#).

### Public Member Functions

- void [Error](#) (System.Xml.XmlException exception)
- void [FatalError](#) (System.Xml.XmlException exception)
- void [Warning](#) (System.Xml.XmlException exception)

### 1.46.1 Detailed Description

This interface will manage errors during the parsing of a XML document.

### 1.46.2 Member Function Documentation

#### 1.46.2.1 void Error (System.Xml.XmlException *exception*)

This method manage an error exception occurred during the parsing process.

##### Parameters

*exception* The exception thrown by the parser.

Implemented in [Asn1XerSaxHandler](#), and [XmlSaxDefaultHandler](#).

#### 1.46.2.2 void FatalError (System.Xml.XmlException *exception*)

This method manage a fatal error exception occurred during the parsing process.

##### Parameters

*exception* The exception thrown by the parser.

Implemented in [Asn1XerSaxHandler](#), and [XmlSaxDefaultHandler](#).

#### 1.46.2.3 void Warning (System.Xml.XmlException *exception*)

This method manage a warning exception occurred during the parsing process.

##### Parameters

*exception* The exception thrown by the parser.

Implemented in [Asn1XerSaxHandler](#), and [XmlSaxDefaultHandler](#).

## 1.47 XmlSaxLexicalHandler Interface Reference

### Public Member Functions

- void [Comment](#) (char[ ] *ch*, int *start*, int *length*)
- void [EndCDATA](#) ()
- void [EndDTD](#) ()
- void [EndEntity](#) (System.String *name*)
- void [StartCDATA](#) ()
- void [StartDTD](#) (System.String *name*, System.String *publicId*, System.String *systemId*)
- void [StartEntity](#) (System.String *name*)

### 1.47.1 Detailed Description

This interface will manage the Content events of a XML document.

### 1.47.2 Member Function Documentation

#### 1.47.2.1 void [Comment](#) (char[ ] *ch*, int *start*, int *length*)

This method manage the notification when Characters elements were found.

#### Parameters

- ch* The array with the characters found.
- start* The index of the first position of the characters found.
- length* Specify how many characters must be read from the array.

#### 1.47.2.2 void [EndCDATA](#) ()

This method manage the notification when the end of a CDATA section were found.

#### 1.47.2.3 void [EndDTD](#) ()

This method manage the notification when the end of DTD declarations were found.

#### 1.47.2.4 void [EndEntity](#) (System.String *name*)

This method report the end of an entity.

#### Parameters

- name* The name of the entity that is ending.

#### 1.47.2.5 void [StartCDATA](#) ()

This method manage the notification when the start of a CDATA section were found.



#### **1.47.2.6 void StartDTD (System.String *name*, System.String *publicId*, System.String *systemId*)**

This method manage the notification when the start of DTD declarations were found.

##### **Parameters**

*name* The name of the DTD entity.

*publicId* The public identifier.

*systemId* The system identifier.

#### **1.47.2.7 void StartEntity (System.String *name*)**

This method report the start of an entity.

##### **Parameters**

*name* The name of the entity that is ending.

## 1.48 XmlSaxLocator Interface Reference

Inherited by [XmlSaxLocatorImpl](#).

### Public Member Functions

- int [GetColumnNumber](#) ()
- int [GetLineNumber](#) ()
- System.String [GetPublicId](#) ()
- System.String [GetSystemId](#) ()

### 1.48.1 Detailed Description

This interface is created to emulate the SAX Locator interface behavior.

### 1.48.2 Member Function Documentation

#### 1.48.2.1 int GetColumnNumber ()

This method return the column number where the current document event ends.

#### Returns

The column number where the current document event ends.

Implemented in [XmlSaxLocatorImpl](#).

#### 1.48.2.2 int GetLineNumber ()

This method return the line number where the current document event ends.

#### Returns

The line number where the current document event ends.

Implemented in [XmlSaxLocatorImpl](#).

#### 1.48.2.3 System.String GetPublicId ()

This method is not supported, it is included for compatibility.

#### Returns

The saved public identifier.

Implemented in [XmlSaxLocatorImpl](#).

#### **1.48.2.4 System.String GetSystemId ()**

This method is not supported, it is included for compatibility.

#### **Returns**

The saved system identifier.

Implemented in [XmlSaxLocatorImpl](#).

## 1.49 XmlSaxLocatorImpl Class Reference

Inherits [Com::Objsys::Asn1::Runtime::XmlSaxLocator](#).

### Public Member Functions

- virtual int [GetColumnNumber](#) ()
- virtual int [GetLineNumber](#) ()
- virtual System.String [GetPublicId](#) ()
- virtual System.String [GetSystemId](#) ()
- virtual void [SetColumnNumber](#) (int columnNumber)
- virtual void [SetLineNumber](#) (int lineNumber)
- virtual void [SetPublicId](#) (System.String publicId)
- virtual void [SetSystemId](#) (System.String systemId)
- [XmlSaxLocatorImpl](#) ([XmlSaxLocator](#) locator)
- [XmlSaxLocatorImpl](#) ()

### 1.49.1 Detailed Description

This class is created for emulates the SAX LocatorImpl behaviors.

### 1.49.2 Constructor & Destructor Documentation

#### 1.49.2.1 [XmlSaxLocatorImpl](#) ()

This method returns a new instance of 'XmlSaxLocatorImpl'.

#### Returns

A new 'XmlSaxLocatorImpl' instance.

#### 1.49.2.2 [XmlSaxLocatorImpl](#) ([XmlSaxLocator](#) *locator*)

This method returns a new instance of 'XmlSaxLocatorImpl'. Create a persistent copy of the current state of a locator.

#### Parameters

*locator* The current state of a locator.

#### Returns

A new 'XmlSaxLocatorImpl' instance.

### 1.49.3 Member Function Documentation

#### 1.49.3.1 virtual int [GetColumnNumber](#) () [virtual]

Return the saved column number.

**Returns**

The saved column number.

Implements [XmlSaxLocator](#).

**1.49.3.2 virtual int GetLineNumber () [virtual]**

Return the saved line number.

**Returns**

The saved line number.

Implements [XmlSaxLocator](#).

**1.49.3.3 virtual System.String GetPublicId () [virtual]**

This method is not supported, it is included for compatibility. Return the saved public identifier.

**Returns**

The saved public identifier.

Implements [XmlSaxLocator](#).

**1.49.3.4 virtual System.String GetSystemId () [virtual]**

This method is not supported, it is included for compatibility. Return the saved system identifier.

**Returns**

The saved system identifier.

Implements [XmlSaxLocator](#).

**1.49.3.5 virtual void SetColumnNumber (int *columnNumber*) [virtual]**

Set the column number for this locator.

**Parameters**

*columnNumber* The column number.

**1.49.3.6 virtual void SetLineNumber (int *lineNumber*) [virtual]**

Set the line number for this locator.

**Parameters**

*lineNumber* The line number.

### **1.49.3.7 virtual void SetPublicId (System.String *publicId*) [virtual]**

This method is not supported, it is included for compatibility. Set the public identifier for this locator.

#### **Parameters**

*publicId* The new public identifier.

### **1.49.3.8 virtual void SetSystemId (System.String *systemId*) [virtual]**

This method is not supported, it is included for compatibility. Set the system identifier for this locator.

#### **Parameters**

*systemId* The new system identifier.

## 1.50 XmlSaxParser Class Reference

Inherited by [XmlSaxParserAdapter](#).

### Public Member Functions

- virtual [XmlSaxContentHandler](#) [GetContentHandler](#) ()
- virtual [XmlSaxEntityResolver](#) [GetEntityResolver](#) ()
- virtual [XmlSaxErrorHandler](#) [GetErrorHandler](#) ()
- virtual void [Parse](#) ([XmlSource](#) source)
- virtual void [Parse](#) (System.IO.Stream stream, System.String URI)
- virtual void [Parse](#) (System.IO.Stream stream)
- virtual void [Parse](#) (System.String filepath)
- virtual void [Parse](#) (System.IO.FileInfo filepath)
- virtual void [Parse](#) ([XmlSource](#) source, [XmlSaxContentHandler](#) handler)
- virtual void [Parse](#) (System.IO.Stream stream, [XmlSaxContentHandler](#) handler, System.String URI)
- virtual void [Parse](#) (System.IO.Stream stream, [XmlSaxContentHandler](#) handler)
- virtual void [Parse](#) (System.String filepath, [XmlSaxContentHandler](#) handler)
- virtual void [Parse](#) (System.IO.FileInfo filepath, [XmlSaxContentHandler](#) handler)
- virtual void [SetContentHandler](#) ([XmlSaxContentHandler](#) handler)
- virtual void [SetDocumentHandler](#) ([XmlSaxContentHandler](#) handler)
- virtual void [SetEntityResolver](#) ([XmlSaxEntityResolver](#) resolver)
- virtual void [SetErrorHandler](#) ([XmlSaxErrorHandler](#) handler)
- [XmlSaxParser](#) ()

### Static Public Member Functions

- static [XmlSaxParser](#) [CloneInstance](#) ([XmlSaxParser](#) instance)
- static [XmlSaxParser](#) [NewInstance](#) ()

### Protected Attributes

- [XmlSaxContentHandler](#) [callBackHandler](#)
- [XmlSaxEntityResolver](#) [entityResolver](#)
- [XmlSaxErrorHandler](#) [errorHandler](#)
- [XmlSaxLexicalHandler](#) [lexical](#)
- [XmlSaxLocatorImpl](#) [locator](#)
- bool [namespaceAllowed](#)
- System.String [parserFileName](#)
- System.Xml.XmlTextReader [reader](#)

### Properties

- bool [NamespaceAllowed](#) [get, set]

#### 1.50.1 Detailed Description

Emulates the SAX parsers behaviours.

## 1.50.2 Constructor & Destructor Documentation

### 1.50.2.1 XmlSaxParser ()

Public constructor for the class.

## 1.50.3 Member Function Documentation

### 1.50.3.1 static XmlSaxParser CloneInstance (XmlSaxParser *instance*) [static]

Create a clone instance of 'XmlSaxParser'.

#### Parameters

*instance* The [XmlSaxParser](#) instance to be cloned.

#### Returns

A clone 'XmlSaxParser' instance.

### 1.50.3.2 virtual XmlSaxContentHandler GetContentHandler () [virtual]

Obtains the object that will handle all the content events.

#### Returns

The object that handles the content events.

### 1.50.3.3 virtual XmlSaxEntityResolver GetEntityResolver () [virtual]

Returns the current entity resolver.

#### Returns

The current entity resolver, or null if none has been registered.

### 1.50.3.4 virtual XmlSaxErrorHandler GetErrorHandler () [virtual]

Assigns the object that will handle all the error events.

#### Returns

The object that handles the error events.

### 1.50.3.5 static XmlSaxParser NewInstance () [static]

Returns a new instance of 'XmlSaxParser'.

#### Returns

A new 'XmlSaxParser' instance.



#### **1.50.3.6 virtual void Parse (XmlSource *source*) [virtual]**

Parses the specified 'XmlSource' and processes the events over the specified handler, and resolves the entities with the specified URI.

##### **Parameters**

*source* The 'XmlSource' instance with the XML.

#### **1.50.3.7 virtual void Parse (System.IO.Stream *stream*, System.String *URI*) [virtual]**

Parses the specified stream and processes the events over previously specified handler, and resolves the external entities with the specified URI.

##### **Parameters**

*stream* The stream with the XML.

*URI* The namespace URI for resolve external entities.

#### **1.50.3.8 virtual void Parse (System.IO.Stream *stream*) [virtual]**

Parses the specified stream and process the events over previously specified handler.

##### **Parameters**

*stream* The stream with the XML.

#### **1.50.3.9 virtual void Parse (System.String *filepath*) [virtual]**

Parses the specified file path and processes the events over previously specified handler.

##### **Parameters**

*filepath* The path of the file with the XML.

#### **1.50.3.10 virtual void Parse (System.IO.FileInfo *filepath*) [virtual]**

Parses the specified file and process the events over previously specified handler.

##### **Parameters**

*filepath* The file with the XML.

#### **1.50.3.11 virtual void Parse (XmlSource *source*, XmlSaxContentHandler *handler*) [virtual]**

Parses the specified 'XmlSource' instance and process the events over the specified handler, and resolves the entities with the specified URI.

##### **Parameters**

*source* The 'XmlSource' that contains the XML.

*handler* The handler that manages the parser events.

**1.50.3.12 virtual void Parse (System.IO.Stream *stream*, XmlSaxContentHandler *handler*, System.String *URI*) [virtual]**

Parses the specified stream and process the events over the specified handler, and resolves the entities with the specified URI.

**Parameters**

*stream* The stream with the XML.

*handler* The handler that manage the parser events.

*URI* The namespace URI for resolve external etities.

**1.50.3.13 virtual void Parse (System.IO.Stream *stream*, XmlSaxContentHandler *handler*) [virtual]**

Parses the specified stream and process the events over the specified handler.

**Parameters**

*stream* The stream with the XML.

*handler* The handler that manage the parser events.

**1.50.3.14 virtual void Parse (System.String *filepath*, XmlSaxContentHandler *handler*) [virtual]**

Parses the specified file path and process the events over the specified handler.

**Parameters**

*filepath* The path of the file to be used.

*handler* The handler that manage the parser events.

**1.50.3.15 virtual void Parse (System.IO.FileInfo *filepath*, XmlSaxContentHandler *handler*) [virtual]**

Parses the specified file and process the events over the specified handler.

**Parameters**

*filepath* The file to be used.

*handler* The handler that manages the parser events.

**1.50.3.16 virtual void SetContentHandler (XmlSaxContentHandler *handler*) [virtual]**

Assigns the object that will handle all the content events.

**Parameters**

*handler* The object that handles the content events.

### **1.50.3.17 virtual void SetDocumentHandler (XmlSaxContentHandler *handler*) [virtual]**

Assigns the object that will handle all the document events.

#### **Parameters**

*handler* The object that handles the content events.

### **1.50.3.18 virtual void SetEntityResolver (XmlSaxEntityResolver *resolver*) [virtual]**

Allows an application to register an entity resolver.

#### **Parameters**

*resolver* The entity resolver.

### **1.50.3.19 virtual void SetErrorHandler (XmlSaxErrorHandler *handler*) [virtual]**

Assigns the object that will handle all the error events.

#### **Parameters**

*handler* The object that handles the errors events.

## **1.50.4 Member Data Documentation**

### **1.50.4.1 XmlSaxContentHandler callBackHandler [protected]**

[XmlSaxContentHandler](#) variable manages the Content events of a XML document.

### **1.50.4.2 XmlSaxEntityResolver entityResolver [protected]**

[XmlSaxEntityResolver](#) variable for resolving entities

### **1.50.4.3 XmlSaxErrorHandler errorHandler [protected]**

[XmlSaxErrorHandler](#) variable manages errors during the parsing of a XML document

### **1.50.4.4 XmlSaxLexicalHandler lexical [protected]**

[XmlSaxLexicalHandler](#) variable manages the Content events of a XML document

### **1.50.4.5 XmlSaxLocatorImpl locator [protected]**

[XmlSaxLocatorImpl](#) variable to emulates the SAX LocatorImpl behaviors.

### **1.50.4.6 bool namespaceAllowed [protected]**

Bool variable manages XML document namespace processing.

#### **1.50.4.7 System.String parserFileName [protected]**

String variable holds the XER or XML message file name

#### **1.50.4.8 System.Xml.XmlTextReader reader [protected]**

XmlTextReader variable manages XML document parsing.

### **1.50.5 Property Documentation**

#### **1.50.5.1 bool NamespaceAllowed [get, set]**

Indicates whether the 'XmlSaxParser' allows namespaces.

## 1.51 XmlSaxParserAdapter Class Reference

Inherits [Com::Objsys::Asn1::Runtime::XmlSaxParser](#), and [Com::Objsys::Asn1::Runtime::XmlSaxContentHandler](#).

### Public Member Functions

- virtual void [Characters](#) (char[ ] ch, int start, int length)
- virtual void [EndDocument](#) ()
- virtual void [EndElement](#) (System.String namespaceURI, System.String localName, System.String qName)
- virtual void [EndPrefixMapping](#) (System.String prefix)
- virtual void [IgnorableWhitespace](#) (char[ ] ch, int start, int length)
- virtual void [ProcessingInstruction](#) (System.String target, System.String data)
- virtual void [SetDocumentLocator](#) ([XmlSaxLocator](#) locator)
- virtual void [SkippedEntity](#) (System.String name)
- virtual void [StartDocument](#) ()
- virtual void [StartElement](#) (System.String namespaceURI, System.String localName, System.String qName, [XmlAttributes](#) qAtts)
- virtual void [StartPrefixMapping](#) (System.String prefix, System.String uri)

### 1.51.1 Detailed Description

This class provides the base implementation for the management of XML documents parsing.

### 1.51.2 Member Function Documentation

#### 1.51.2.1 virtual void Characters (char[ ] *ch*, int *start*, int *length*) [virtual]

This method manage the notification when Characters element were found.

##### Parameters

- ch* The array with the characters founds
- start* The index of the first position of the characters found
- length* Specify how many characters must be read from the array

Implements [XmlSaxContentHandler](#).

#### 1.51.2.2 virtual void EndDocument () [virtual]

This method manage the notification when the end document node were found

Implements [XmlSaxContentHandler](#).

#### 1.51.2.3 virtual void EndElement (System.String *namespaceURI*, System.String *localName*, System.String *qName*) [virtual]

This method manage the notification when the end element node were found

##### Parameters

- namespaceURI* The namespace URI of the element

*localName* The local name of the element

*qName* The long name (qualify name) of the element

Implements [XmlSaxContentHandler](#).

#### **1.51.2.4 virtual void EndPrefixMapping (System.String *prefix*) [virtual]**

This method manage the event when an area of expecific URI prefix was ended.

##### **Parameters**

*prefix* The prefix that ends.

Implements [XmlSaxContentHandler](#).

#### **1.51.2.5 virtual void IgnorableWhitespace (char[] *ch*, int *start*, int *length*) [virtual]**

This method manage the event when a ignorable whitespace node were found

##### **Parameters**

*ch* The array with the ignorable whitespaces

*start* The index in the array with the ignorable whitespace

*length* The length of the whitespaces

Implements [XmlSaxContentHandler](#).

#### **1.51.2.6 virtual void ProcessingInstruction (System.String *target*, System.String *data*) [virtual]**

This method manage the event when a processing instruction were found

##### **Parameters**

*target* The processing instruction target

*data* The processing instruction data

Implements [XmlSaxContentHandler](#).

#### **1.51.2.7 virtual void SetDocumentLocator (XmlSaxLocator *locator*) [virtual]**

Receive an object for locating the origin of events into the XML document

##### **Parameters**

*locator* A [XmlSaxLocator](#) object that can return the location of any events into the XML document

Implements [XmlSaxContentHandler](#).

#### 1.51.2.8 virtual void SkippedEntity (System.String name) [virtual]

This method manage the event when a skipped entity was found.

##### Parameters

*name* The name of the skipped entity.

Implements [XmlSaxContentHandler](#).

#### 1.51.2.9 virtual void StartDocument () [virtual]

This method manage the event when a start document node were found

Implements [XmlSaxContentHandler](#).

#### 1.51.2.10 virtual void StartElement (System.String namespaceURI, System.String localName, System.String qName, XmlAttributes qAtts) [virtual]

This method manage the event when a start element node were found

##### Parameters

*namespaceURI* The namespace uri of the element tag

*localName* The local name of the element

*qName* The Qualify (long) name of the element

*qAtts* The list of attributes of the element

Implements [XmlSaxContentHandler](#).

#### 1.51.2.11 virtual void StartPrefixMapping (System.String prefix, System.String uri) [virtual]

This methods indicates the start of a prefix area in the XML document.

##### Parameters

*prefix* The prefix of the area.

*uri* The namespace URI of the prefix area.

Implements [XmlSaxContentHandler](#).

## 1.52 XmlSource Class Reference

### Public Member Functions

- [XmlSource](#) (System.String source)
- [XmlSource](#) (System.IO.StreamReader reader)
- [XmlSource](#) (System.IO.Stream stream)
- [XmlSource](#) ()

### Properties

- System.IO.Stream [Bytes](#) [get, set]
- System.IO.StreamReader [Characters](#) [get, set]
- System.String [Uri](#) [get, set]

### 1.52.1 Detailed Description

This class is used to encapsulate a source of Xml code in an single class.

### 1.52.2 Constructor & Destructor Documentation

#### 1.52.2.1 [XmlSource](#) ()

Constructs an empty [XmlSource](#) instance.

#### 1.52.2.2 [XmlSource](#) (System.IO.Stream *stream*)

Constructs a [XmlSource](#) instance with the specified source System.IO.Stream.

#### Parameters

*stream* The stream containing the document.

#### 1.52.2.3 [XmlSource](#) (System.IO.StreamReader *reader*)

Constructs a [XmlSource](#) instance with the specified source System.IO.StreamReader.

#### Parameters

*reader* The reader containing the document.

#### 1.52.2.4 [XmlSource](#) (System.String *source*)

Construct a [XmlSource](#) instance with the specified source Uri string.

#### Parameters

*source* The source containing the document.



### **1.52.3 Property Documentation**

#### **1.52.3.1 System.IO.Stream Bytes [get, set]**

Represents the source Stream of the [XmlSource](#).

#### **1.52.3.2 System.IO.StreamReader Characters [get, set]**

Represents the source StreamReader of the [XmlSource](#).

#### **1.52.3.3 System.String Uri [get, set]**

Represents the source URI of the [XmlSource](#).

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