

XYO Network Encoding Scheme

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1 Overview

Everything that is encoded is a superset of an *Object*. An object is defined by having an object header that contains information about how to unpack that object. This information includes how to read the size of the object, if the object is Iterable (typed and untyped), and the ID of the object.

2 Object Header

The object header is prepended to every object to obtain information about the object. This is broken into two primary sections, the encoding catalogue and ID.

2.1 Encoding catalogue (1 Byte)

The encoding catalogue gives information about the size of the size and if the object is Iterable (typed and untyped).

2.1.1 Structure

Size	Name
2 bits	Size identifier size
1 bit	Is Iterable
1 bit	Is a typed iterable
4 bits	Reserved for future use and size.

2.1.2 Size identifier size (2 bits)

These two bits are used to determine where and how many bits to read to obtain the size of the object. The states of the Size identifier size flags are listed below.

Flag	Name
00b	Read size from the 2 most significant reserved bits.
01b	Read size from the 2 most significant reserved bits.
10	Read
4 bits	Reserved for future use and size.

2.1.3 00b and 01b

Read size from the 2 most significant reserved bits.

2.1.4 10b

This indicates to read 2 bytes after the minor to obtain the size.

2.1.5 11b

This indicates to read 4 bytes after the minor to obtain the size.

2.2 Major (6 bits)

Used as an ID for the value/payload. If the Size Identifier Size is 00b or 01b then the major must be the size of the value/payload.

2.3 Minor (1 byte)

Used as a secondary ID for the value/payload.

2.4 Size (2 or 4 bytes)

Used to indicate the size (in bytes) of the value/payload. This is only included in the header if the Size Identifier Size is 10b or 11b. The size is always unsigned and includes itself.

Size Identifier Size	Value
00b	None
01b	None
10b	2 Bytes (Short)
11b	4 Bytes (Int)

2.5 Examples

Name	Value	Description
Size identifier size	00b	A 2 bit description of the size.
Major	000001b	The major of the item.
Minor	0x1a	The minor of the item.
Value	0x33	The value is 1 byte because of the major.

Name	Value	Description
Size identifier size	01b	A 2 bit description of the size.
Major	000001b	The major of the item.
Minor	0x2a	The minor of the item.
Value	0x23	The value is 1 byte because of the major.

Name	Value	Description
Size identifier size	10b	A 2 bit description of the size.
Major	000011b	The major of the item.
Minor	0x2b	The minor of the item.
Size	0x00,0x05	The minor of the item.
Value	0x01,0x02,0x03	The value is 1 byte because of the major.

Name	Value	Description
Size identifier size	11b	A 2 bit description of the size.
Major	000011b	The major of the item.
Minor	0x2b	The minor of the item.
Size	0x00,0x00,0x00,0x04	The minor of the item.
Value	0x13,0x37	The value is 1 byte because of the major.