

<b>Basic Types</b>			
<b>integer</b>	4 bytes		
<b>long</b>	8 bytes		
<b>double</b>	8 bytes		
<b>boolean</b>	1 byte		
<b>byte array</b>	2 bytes for length (n), then n bytes		
<b>string</b>	2 bytes for string length then utf-8 encoded string.		
<b>Lists</b>	Lists are used in various places. List<T> indicates a list of elements of type T. Lists consists of the length of the list (n) using a VarUnsignedInt followed by n elements of type T		
<b>VarUnsignedInt</b>	An encoding of an integer using 1 - 5 bytes If the first byte is 0 then the list is length 0 (1 byte in total) If the first byte is > 0 and < 128 then the list length is the value of the first byte (1 byte in total) If the first byte is -2 then the following 2 bytes represent the length of the list (3 bytes in total) If the first byte is -4 then the following 4 bytes represent the length of the list (5 bytes in total)		
<b>Sequences</b>	A sequence is an open ended list that may be grown. Sequence<T> indicates a sequence of elements of type T. Each element in the sequence is preceded with a element follows marker. This allows elements to be appended to the end of a stream (File).		
<b>AxiomList</b>	Axiom Set Chunk Id	4 bytes	value = 'AXMS'
	Metadata Chunk		
	Axioms	List<Axiom>	
<b>OntologyId</b>	Ontology IRI	string	May be empty
	Ontology version IRI	string	May be empty
	Anonymous Id		
<b>utf-8 encoding of strings</b>	If a character c is in the range \u0001 through \u007f, it is represented by one byte: (byte)c  If a character c is \u0000 or is in the range \u0080 through \u07ff, then it is represented by two bytes, to be written in the order shown: (byte)(0xc0   (0x1f & (c >> 6))) (byte)(0x80   (0x3f & c))  If a character c is in the range \u0800 through uffff, then it is represented by three bytes, to be written in the order shown: (byte)(0xe0   (0x0f & (c >> 12))) (byte)(0x80   (0x3f & (c >> 6))) (byte)(0x80   (0x3f & c))		

Ontology Document			
Preamble	Magic Number	4 bytes	value = 'BO2O'
	Version Number	4 bytes	
Document Header	Document Header Chunk Id	4 bytes	value = 'DHDR'
	Document Header Chunk Size	4 bytes	0 indicates empty header
	Document metadata	MetadataChunk (8 or more bytes)	
Ontology Header Chunk	Ontology Header Chunk Id	4 bytes	value = 'OHDR'
	Ontology Header Chunk Size	4 bytes	
Imported Document IRIs Chunk	Imported Document IRIs Chunk Id	4 bytes	value = 'IMPS'
	Imported Document IRIs Chunk Size	4 bytes	0 indicates no imports
	Imported Document IRI strings	List<string> (0 or more bytes)	
IRI Table Chunk	IRI Table Chunk Id	4 bytes	value = 'ITBL'
	IRI Table Chunk Size	4 bytes	
	IRI Table	0 or more bytes	
Ontology Annotations Chunk	Ontology Annotations Chunk Id	4 bytes	value = 'ANNO'
	Ontology Annotations Chunk Size	4 bytes	0 indicates no annotations
	Annotations	List<Annotation> (0 or more bytes)	
AxiomLists	Axiom lists	List<AxiomList> (1 or more bytes)	
AppendedChangeSequence	Appended change list	ChangeDataSequence (0 or more bytes)	

Metadata			
Metadata Chunk	Metadata Chunk Id	4 bytes	value = 'MDTA'
	Metadata Chunk Size	4 bytes	0 indicates empty metadata
	Metadata KeyValues	List<Metadata KeyValue> (zero or more bytes)	
Metadata KeyValue Chunk	Metadata KeyValue Chunk Id	4 bytes	value = 'MDKV'
	Metadata KeyValue Chunk Size	4 bytes	
	Metadata Key	string	
	Metadata Value Type	1 byte	<b>0</b> = string <b>1</b> = integer <b>2</b> = long <b>3</b> = double <b>4</b> = boolean <b>5</b> byte array
	Metadata Value	1 or more bytes	
	Distinguished values for Metadata keys are:	ts	long
		generator	string
		title	string
		comment	string
		axiomcount	long

IRI Table			
IRI Table	Prefixes table	List<string> (1 or more bytes)	Order sensitive
	Local names table	List<string> (1 or more bytes)	Order sensitive
	Table Entries	List<IRI Table Entry> (1 or more bytes)	Order sensitive
IRI Table Entry	Prefix index	4 bytes	
	Local name index	4 bytes	

OWL Objects		Object Type Id	
Annotation	Object Type Id	1 byte	73
	Property	Annotation property (1 or more bytes)	
	Annotation Value	IRI OR Literal OR AnonymousIndividual	
IRI	Object Type Id	1 byte	
	Lexical value	string (2 or more bytes)	
Literal	Object Type Id	1 byte	11
	TODO		
Class	Object Type Id	1 byte	4
	IRI Table Index	VarUnsignedInt	
ObjectProperty	Object Type Id	1 byte	5
	IRI Table Index	VarUnsignedInt	
DataProperty	Object Type Id	1 byte	6
	IRI Table Index	VarUnsignedInt	
AnnotationProperty	Object Type Id	1 byte	7
	IRI Table Index	VarUnsignedInt	
Datatype : DataRange	Object Type Id	1 byte	8
	IRI Table Index	VarUnsignedInt	
NamedIndividual : Individual	Object Type Id	1 byte	9
	IRI Table Index	VarUnsignedInt	
AnonymousIndividual : Individual	Object Type Id	1 byte	10
	Anonymous Id	VarUnsignedLong	
ObjectInverseOf	Object Type Id	1 byte	12
	ObjectProperty OR ObjectInverseOf		
DataIntersectionOf : DataRange	Object Type Id	1 byte	13
	Data ranges	List<DataRange> (1 or more bytes)	
DataUnionOf : DataRange	Object Type Id	1 byte	14
	Data ranges	List<DataRange> (1 or more bytes)	
DataComplementOf : DataRange	Object Type Id	1 byte	15
	Complemented data range	DataRange (1 or more bytes)	
DataOneOf : DataRange	Object Type Id	1 byte	16
	One of literals	List<Literal> (1 or more bytes)	
DatatypeRestriction : DataRange	Object Type Id	1 byte	17
	Restricted data range	1 or more bytes	
FacetRestriction	Object Type Id	1 byte	18
	Facet	1 byte	
			0 = length 1 = minLength 2 = maxLength 3 = pattern 4 = minInclusive 5 = minExclusive 6 = maxInclusive 7 = maxExclusive 8 = totalDigits 9 = fraction digits 10 = language
	Facet value	Literal (1 or more bytes)	
ObjectIntersectionOf : ClassExpression	Object Type Id	1 byte	19
	Class expressions	List<ClassExpression> (1 or more bytes)	
ObjectUnionOf : ClassExpression	Object Type Id	1 byte	20
	Class expressions	List<ClassExpression> (1 or more bytes)	
ObjectComplementOf : ClassExpression	Object Type Id	1 byte	21
	Complemented class expression	ClassExpression (1 or more bytes)	
ObjectOneOf: Class Expression	Object Type Id	1 byte	22
	Individuals	List<Individual> (1 or more bytes)	
ObjectSomeValuesFrom : ClassExpression	Object Type Id	1 byte	23
	Property	ObjectPropertyExpression (1 or more bytes)	
ObjectAllValuesFrom : ClassExpression	Property	ClassExpression (1 or more bytes)	24
	Filler	ClassExpression (1 or more bytes)	
ObjectHasValue : ClassExpression	Object Type Id	1 byte	25
	Property	ObjectPropertyExpression (1 or more bytes)	
ObjectHasSelf : ClassExpression	Property	Individual (1 or more bytes)	26
	Filler		
ObjectMinCardinality : ClassExpression	Object Type Id	1 byte	27
	Property	ObjectPropertyExpression (1 or more bytes)	
ObjectMaxCardinality : ClassExpression	Cardinality	4 bytes	28
	Filler	ClassExpression (1 or more bytes)	
ObjectExactCardinality : ClassExpression	Object Type Id	1 byte	29
	Cardinality	4 bytes	
DataSomeValuesFrom : ClassExpression	Property	ObjectPropertyExpression (1 or more bytes)	30
	Filler	ClassExpression (1 or more bytes)	
DataAllValuesFrom : ClassExpression	Object Type Id	1 byte	31
	Property	DataProperty (1 or more bytes)	
DataHasValue : ClassExpression	Property	DataRange (1 or more bytes)	32
	Filler		
DataMinCardinality : ClassExpression	Object Type Id	1 byte	33
	Cardinality	4 bytes	
DataMaxCardinality : ClassExpression	Property	DataProperty (1 or more bytes)	34
	Filler	DataRange (1 or more bytes)	
DataExactCardinality : ClassExpression	Object Type Id	1 byte	35
	Cardinality	4 bytes	
SubClassOf : Axiom	Property	DataProperty (1 or more bytes)	36
	Filler	DataRange (1 or more bytes)	
EquivalentClasses : Axiom	Object Type Id	1 byte	37
	Annotations	List<Annotation> (1 or more bytes)	
DisjointClasses : Axiom	SubClass	ClassExpression (1 or more bytes)	38
	SuperClass	ClassExpression (1 or more bytes)	
DisjointUnionOf : Axiom	Object Type Id	1 byte	39
	Annotations	List<Annotation> (1 or more bytes)	
SubObjectPropertyOf : Axiom	Class	Class (1 or more bytes)	40
	Class expressions	List<ClassExpression> (1 or more bytes)	
SubObjectPropertyOf : Axiom (With chain)	Object Type Id	1 byte	41
	Annotations	List<Annotation> (1 or more bytes)	
EquivalentObjectProperties : Axiom	SubProperty Chain	ObjectPropertyExpression (1 or more bytes)	42
	SuperProperty	ObjectPropertyExpression (1 or more bytes)	
DisjointObjectProperties : Axiom	Object Type Id	1 byte	43
	Annotations	List<Annotation> (1 or more bytes)	
ObjectPropertyDomain : Axiom	Properties	List<ObjectPropertyExpression> (1 or more bytes)	44
ObjectPropertyRange : Axiom	Object Type Id	1 byte	45
	Annotations	List<Annotation> (1 or more bytes)	
InverseObjectProperties : Axiom	Property	ObjectPropertyExpression (1 or more bytes)	46
	Range	ClassExpression (1 or more bytes)	
FunctionalObjectProperty : Axiom	Object Type Id	1 byte	47
	Annotations	List<Annotation> (1 or more bytes)	
InverseFunctionalObjectProperty : Axiom	Property	ObjectPropertyExpression (1 or more bytes)	48
ReflexiveObjectProperty : Axiom	Object Type Id	1 byte	49
	Annotations	List<Annotation> (1 or more bytes)	
IrreflexiveObjectProperty : Axiom	Property	ObjectPropertyExpression (1 or more bytes)	50
SymmetricObjectProperty : Axiom	Object Type Id	1 byte	51
	Annotations	List<Annotation> (1 or more bytes)	
AsymmetricObjectProperty : Axiom	Property	ObjectPropertyExpression (1 or more bytes)	52
TransitiveObjectProperty : Axiom	Object Type Id	1 byte	53
	Annotations	List<Annotation> (1 or more bytes)	
SubDataPropertyOf : Axiom	Property	ObjectPropertyExpression (1 or more bytes)	54
EquivalentDataProperties : Axiom	Object Type Id	1 byte	55
	Annotations	List<Annotation> (1 or more bytes)	
DisjointDataProperties : Axiom	Properties	List<DataProperty> (1 or more bytes)	56
DataPropertyDomain : Axiom	Object Type Id	1 byte	57
	Annotations	List<Annotation> (1 or more bytes)	
DataPropertyRange : Axiom	Property	DataProperty (1 or more bytes)	58
	Range	DataRange (1 or more bytes)	
FunctionalDataProperty : Axiom	Object Type Id	1 byte	59
	Annotations	List<Annotation> (1 or more bytes)	
DatatypeDefinition : Axiom	Property	DataProperty (1 or more bytes)	60
HasKey : Axiom	Data range	DataRange (1 or more bytes)	61
SameIndividual : Axiom	Object Type Id	1 byte	62
	Annotations	List<Annotation> (1 or more bytes)	
DifferentIndividuals : Axiom	Individuals	List<Individual> (1 or more bytes)	63
ClassAssertion : Axiom	Object Type Id	1 byte	64
	Annotations	List<Annotation> (1 or more bytes)	
ObjectPropertyAssertion : Axiom	Class expression	ClassExpression (1 or more bytes)	65
	Individual	Individual (1 or more bytes)	
NegativeObjectPropertyAssertion : Axiom	Individual	Individual (1 or more bytes)	66
DataPropertyAssertion : Axiom	Object Type Id	1 byte	67
	Annotations	List<Annotation> (1 or more bytes)	
NegativeDataPropertyAssertion : Axiom	Property	ObjectPropertyExpression (1 or more bytes)	68
	Subject	Individual (1 or more bytes)	
AnnotationAssertion : Axiom	Object	Literal (1 or more bytes)	69
SubAnnotationPropertyOf : Axiom	Object Type Id	1 byte	70
	Annotations	List<Annotation> (1 or more bytes)	
AnnotationPropertyDomain : Axiom	SubProperty	AnnotationProperty (1 or more bytes)	71
	SuperProperty	AnnotationProperty (1 or more bytes)	
AnnotationPropertyRange : Axiom	Object Type Id	1 byte	72
	Annotations	List<Annotation> (1 or more bytes)	
Rule : Axiom	Property	AnnotationProperty (1 or more bytes)	74
	Range	IRI (1 or more bytes)	
DifferentIndividualsAtom : Atom	Object Type Id	1 byte	
	Arg	Argument (1 or more bytes)	
SameIndividualAtom : Atom	Arg	Argument (1 or more bytes)	
	Arg	Argument (1 or more bytes)	
ClassAtom : Atom	Object Type Id	1 byte	
	Predicate	ClassExpression (1 or more bytes)	
DataRangeAtom : Atom	Arg	Argument (1 or more bytes)	
	Arg	Argument (1 or more bytes)	
ObjectPropertyAtom : Atom	Object Type Id	1 byte	
	Predicate	ObjectPropertyExpression (1 or more bytes)	
DataPropertyAtom : Atom	Arg	Argument (1 or more bytes)	
	Arg	Argument (1 or more bytes)	
BuiltInAtom : Atom	Object Type Id	1 byte	
	Predicate	IRI	
Variable : IArgument, DArgument	Args	List<DArgument> (1 or more bytes)	
IndividualArgument : IArgument	Object Type Id	1 byte	
	Individual	Individual (1 or more bytes)	
LiteralArgument : DArgument	Object Type Id	1 byte	
	Literal	Literal (1 or more bytes)	

## Ontology deltas document

<b>Preamble</b>	Magic Number	4 bytes	value = 'ODLT'
	Version Number	4 bytes	
<b>Deltas</b>	Delta sequences	Sequence<Delta>	

Change Data			
ChangeDataSequence	Change lists	Sequence<ChangeList>	
ChangeDataList	Metadata	MetadataChunk	
	Change data	ChangeDataChunk	
ChangeDataChunk	Change data chunk Id	4 bytes	value = 'CHGD'
	Change data chunk size	4 bytes	
	IRI Table	IRI Table Chunk	
	Change data	List<OntologyChangeData>	
OntologyChangeData	Change data	Add Annotation, Remove Annotation, Add Axiom, Remove Axiom (NO SET ID)	

Change Record			
<b>ChangeRecordSequence</b>	Change record sequence	Sequence<ChangeRecordChunk>	
<b>ChangeRecordChunk</b>	Chunk Id	4 bytes	value = 'CHRC'
	Chunk Size	4 bytes	
	Metadata	MetadataChunk	
	Modified ontologies	OntologyIdListChunk	
<b>OntologyIdListChunk</b>	Chunk Id	4 bytes	value = 'OIDL'
	Chunk Size	4 bytes	
	Ontology Ids	List<OntologyId>	
<b>ChangeDataRunsChunk</b>	Chunk Id	4 bytes	value = 'CHDR'
	Chunk Size	4 bytes	
	Runs	List<ChangeDataRun>	
<b>ChangeDataRun</b>	Ontology Id	OntologyId	
	IRI table	IRI Table Chunk	
	Change data	List<OntologyChangeData>	