## 8.48 StructureDefinition

This *Structured DataType* is used to provide the meta data for a custom *Structure* *DataType*. It is derived from the *DataType* *DataTypeDefinition*. The *StructureDefinition* is formally defined in Table 32.

Table 32 – StructureDefinition Structure

|  |  |  |
| --- | --- | --- |
| **Name** | **Type** | **Description** |
| StructureDefinition | Structure |  |
| defaultEncodingId | NodeId | The *NodeId* of the default DataTypeEncoding for the *DataType*. The default depends on the message encoding, Default Binary for UA Binary encoding, Default JSON for JSON encoding and Default XML for XML encoding.  If the *DataType* is only used inside nested *Structures* and is not directly contained in an *ExtensionObject*, the encoding *NodeId* is null. |
| baseDataType | NodeId | The *NodeId* of the direct supertype of the *DataType*. This might be the abstract *Structure* or the *Union* *DataType*. |
| structureType | StructureType | An enumeration that specifies the type of Structure defined by the *DataType*.  The StructureType DataType is defined in 8.49.  Only one of the fields defined for the data type is encoded into a value if the data type is a *Union*. |
| fields | StructureField [] | The list of fields that make up the data type.  This definition assumes the structure has a sequential layout.  The StructureField *DataType* is defined in 8.51.  For *Structures* derived from another *Structure* *DataType* this list shall begin with the fields of the baseDataType followed by the fields of this *StructureDefinition*. |

## 8.49 StructureType

This *DataType* is an enumeration that specifies type of *Structure* defined by a *StructureDefinition*. Its values are defined in Table 33.

Table 33 – StructureType Values

|  |  |  |
| --- | --- | --- |
| Name | Value | Description |
| Structure | 0 | A *Structure* without optional fields where none of the fields allow subtyping |
| StructureWithOptionalFields | 1 | A *Structure* with optional fields where none of the fields allow subtyping |
| Union | 2 | A *Union DataType* where none of the fields allow subtyping |
| StructureWithSubtypedValues | 3 | A Structure without optional fields where one or more of the fields allow subtyping |
| UnionWithSubtypedValues | 4 | A *Union DataType* where one or more of the fields allow subtyping |

## 8.51 StructureField

This *Structured DataType* is used to provide the metadata for a field of a custom *Structure* *DataType*. The *StructureField* is formally defined in Table 35.

Table 35 – StructureField Structure

|  |  |  |
| --- | --- | --- |
| **Name** | **Type** | **Description** |
| StructureField | Structure |  |
| name | String | A name for the field that is unique within the *StructureDefinition*. |
| description | LocalizedText | A localized description of the field |
| dataType | NodeId | The *NodeId* of the *DataType* for the field. When used by a StructureDefinition with a structureType of *Structure,* StructureWithOptionalFields or Union then the datatype shall be a concrete DataType, *BaseDataType* *DataType* or *Structure* *DataType*  *If the structureType is* StructureWithSubtypedValues, or UnionWithSubTypedValues and the isOptional field is true then the encoding of the field shall be able to transport any subtype of the DataType. OPC 10000-6 provides more details of specific encodings. |
| valueRank | Int32 | The value rank for the field.  It shall be Scalar (-1) or a fixed rank Array (>=1). |
| arrayDimensions | UInt32[] | This field specifies the maximum supported length of each dimension. If the maximum is unknown the value shall be 0.  The number of elements shall be equal to the value of the v*alueRank* *field*. This field shall be null if v*alueRank* ≤ 0.  The maximum number of elements of an array transferred on the wire is 2147483647 (max Int32). |
| maxStringLength | UInt32 | If the dataType field is a String or ByteString then this field specifies the maximum supported length. If the maximum is unknown the value shall be 0.  If the dataType field is not a String or ByteString the value shall be 0.  If the valueRank is greater than 0 this field applies to each element of the array. |
| isOptional | Boolean | If the structureType is StructureWithOptionalFields this field indicates if a data type field in a *Structure* is optional. In this case a value of FALSE means the *StructureField* is always present in all occurances of the *Structure* *DataType and a value of* TRUE means the *StructureField* may be present in an occurance of the *Structure* *DataType*.  If the *structureType* is *Structure* or *Union* this field shall be FALSE and shall be ignored.  If the structureType is StructureWithSubtypedValues, or UnionWithSubTypedValues this field is used to indicate if the data type field allows subtyping. Subtyping is allowed when set to TRUE. |