

## S2G Schema issues identified by daffodil-1.1.0

- **Issue #1: dfdl properties not allowed to appear in element 'dfdl:simpleType'**

Schema file: Sentinel2X-bandTMCADU.xsd

```
[error] Schema Definition Error: Error loading schema due to org.xml.sax.SAXParseException; systemId:
file:/home/ruhm/workspace-S2G/repository/pt.com.deimos.s2g.resources/mission.specs/Sentinel2X-
bandTM/Sentinel2X-bandTMCADUTypes.xsd; lineNumber: 41; columnNumber: 91; cvc-complex-type.3.2.2: Attribute
'dfdl:lengthKind' is not allowed to appear in element 'dfdl:simpleType'.

[error] Schema Definition Error: Error loading schema due to org.xml.sax.SAXParseException; systemId:
file:/home/ruhm/workspace-S2G/repository/pt.com.deimos.s2g.resources/mission.specs/Sentinel2X-
bandTM/Sentinel2X-bandTMCADUTypes.xsd; lineNumber: 41; columnNumber: 91; cvc-complex-type.3.2.2: Attribute
'dfdl:lengthUnits' is not allowed to appear in element 'dfdl:simpleType'.

[error] Schema Definition Error: Error loading schema due to org.xml.sax.SAXParseException; systemId:
file:/home/ruhm/workspace-S2G/repository/pt.com.deimos.s2g.resources/mission.specs/Sentinel2X-
bandTM/Sentinel2X-bandTMCADUTypes.xsd; lineNumber: 41; columnNumber: 91; cvc-complex-type.3.2.2: Attribute
'dfdl:length' is not allowed to appear in element 'dfdl:simpleType'.
```

The current definition is:

```
<xs:simpleType name="TypeCADUSyncMarker">
  <xs:annotation>
    <xs:appinfo source="http://www.ogf.org/dfdl/">
      <dfdl:simpleType dfdl:lengthKind="explicit" dfdl:lengthUnits="bytes" dfdl:length="4"/>
    </xs:appinfo>
    <xs:appinfo source="http://www.deimos.com.pt/dmx/dmx-1.0">
      <dmx:simpleType dmx:representation="Hexadecimal"/>
    </xs:appinfo>
  </xs:annotation>
  <xs:restriction base="xs:int"/>
</xs:simpleType>
```

According to DFDL standard specification [GFD.207] dfdl:lengthKind and dfdl:lengthUnits are in fact allowed in dfdl:simpleType elements (see section 12.3) and format properties may be specified in an attribute form (see section 7.1).

Hence we believe that the issue raised by daffodil when parsing S2G schemas may actually be a limitation in the implementation of daffodil instead of an actual DFDL compliance issue.

**Please confirm our interpretation above.**

Alternatively, the type could be defined as:

```
<xs:simpleType name="TypeCADUSyncMarker" dfdl:lengthKind="explicit" dfdl:lengthUnits="bytes"
dfdl:length="4" dmx:representation="Hexadecimal"/>
  <xs:restriction base="xs:int"/>
</xs:simpleType>
```

We agree this syntax is more compact and readable although syntactically equivalent.

- **Issue #2: error raised due to custom 'in' and 'inrange' operators**

Schema file: Sentinel2X-bandTMTF.xsd

```
[error] Schema Definition Error: Unable to parse expression. Message: `}' expected but `i' found
Next: in [0]}.
Schema context: element.Spacecraft_Id_V1. Location line 103 column 18 in file:/home/rupm/workspace-
S2G/repository/pt.com.deimos.s2g.resources/mission.specs/Sentinel2X-bandTM/Sentinel2X-bandTMTFType
s.xsd.
```

This message is expected since the custom 'in' and 'inrange' operators are not supported by DFDL standard.

- **Issue #3: The value 'true' is not accepted as boolean expression: <dfdl:discriminator test="{true}"/>**

Schema file: Sentinel2X-bandTMTFTypes.xsd

[error] Schema Definition Error: No element corresponding to step {}true found.  
 Schema context: element.Spacecraft\_Id\_V2. Location line 110 column 18 in file:/home/rupm/workspace-S2G/repository/pt.com.deimos.s2g.resources/mission.specs/Sentinel2X-bandTM/Sentinel2X-bandTMTFTypes.xsd.

For example:

```
<xs:complexType name="TypeTF">
  <xs:sequence>
    <xs:element name="Primary_Header" type="TypePrimaryHeader"/>
    <xs:choice>
      <xs:sequence>
        <xs:annotation>
          <xs:appinfo source="http://www.ogf.org/dfdl/">
            <dfdl:discriminator
test="{../Primary_Header/Master_Channel_Id/Transfer_Frame_Version in [0]}"/>
          </xs:appinfo>
        </xs:annotation>
        <xs:element name="Data_Field_V1" type="xs:hexBinary"
dfdl:lengthKind="explicit" dfdl:lengthUnits="bytes" dfdl:length="1105" dmx:hook="isp"/>
        <xs:element name="Trailer" type="TypeFrameTrailer"/>
      </xs:sequence>
      <xs:sequence>
        <xs:annotation>
          <xs:appinfo source="http://www.ogf.org/dfdl/">
            <dfdl:discriminator test="{true}"/>
          </xs:appinfo>
        </xs:annotation>
        <xs:element name="Data_Field_V2" type="TypeTF_V2"/>
      </xs:sequence>
    </xs:choice>
  </xs:sequence>
</xs:complexType>
```

It seems the value 'true' (used in the choice constructs to identify the default (last) value in case the other choices are not matched) is not accepted as a boolean expression. Using the value '1' instead removes the error reported by Daffodil.

**Please confirm that while "true" is not accepted by Daffodil but it is an acceptable value. Note that we think use of true makes clearer the semantic of the evaluation respect to the use of 1 and therefore makes schema more readable**