Units Normalization

A Best Practice Example

Longitude in Binary Data

- Before Parse: 24 bits not byte aligned, least-signif. bit first, little endian

00000**001 10111010 01001111 10100**000

3 7 4 9 F 4

- After Parse

<longitude>3623412</longitude>

- Easy to access
- Not easy to interpret yet
  - Numeric value corresponds to -41.000000 degrees longitude
  - The raw number is 360/(2^24) degree units.

Longitude in Binary Data - Unit Normalized

```
<longitude>
    <raw>3623412</raw>
    <degrees>-41.0</degrees>
</longitude>
```

Use unit of measure as element name

- DFDL schemas use dfdl:inputValueCalc property to compute normalized value and add to infoset.

Computing Normalized Values

```
<element name="longitude">
  <complexType>
    <sequence>
      <element name="raw" type="xs:int" ... />
      <element name="degrees" type="xs:double"
        dfdl:inputValueCalc='{
          (../raw * 360.0) / 16777216.0
        }' />
    </sequence>
  </complexType>
</element>
```

- DFDL schemas use dfdl:inputValueCalc property to compute normalized value and add to infoset.

Unparsing from Normalized Values

```
<element name="longitude">
  <complexType>
    <sequence>
      <element name="raw" type="xs:int"
        dfdl:outputValueCalc = '{
          fn:round-half-to-even((../degrees * 16777216.0) / 360.0 )
        }'/>
      <element name="degrees" type="xs:double" .../>
    </sequence>
  </complexType>
</element>
```

- DFDL schemas use dfdl:outputValueCalc property to compute raw value from infoset