# DRAFT - Metadata Object Model

### ION GNSS SDR METADATA WORKING GROUP

**SEPTEMBER 14, 2014** 

### Overview

- Normalized object model of metadata schema based upon meeting results from Sept 10, 2014 at ION GNSS+
- UML Model shows the principal object types and relationships.
- Generated schema from object model for specification testing.
- Created temporary github for all artifacts.
  - https://github.com/mbmathews/metadata/blob/master/sche ma/DraftGnssMetadata.xsd
  - Need to move this to an ION owned GIT.

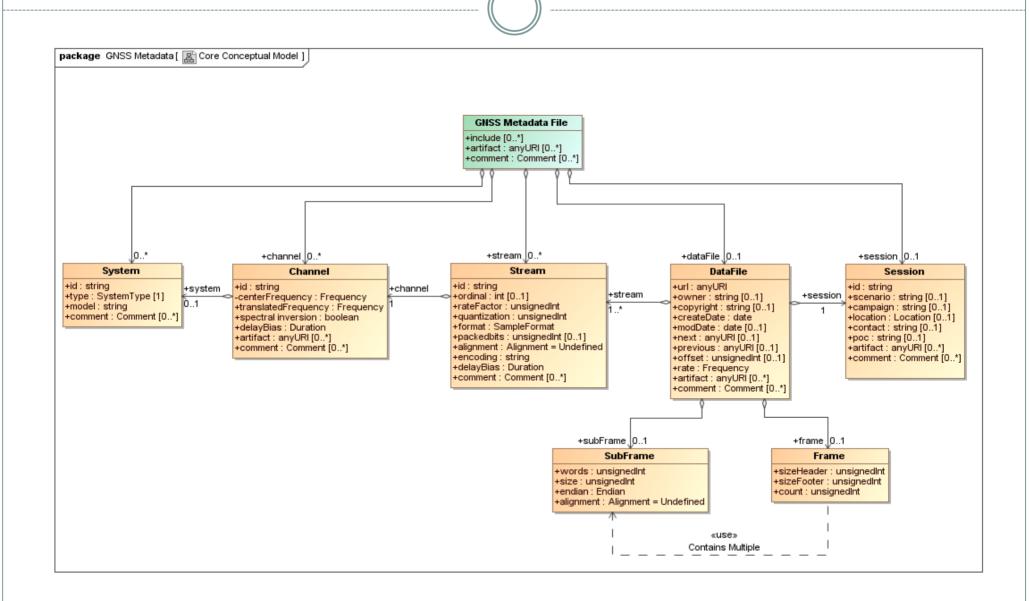
# Changes to proposed schema

- Datafile Element (new) captures specification for a single datafile
- Namespace changes
  - Lump eliminated since contained within definition of datafile. The number of streams included and stream ordinal attribute specified in the datafile element defines the lump (aka sample word).
  - Chunk changed to subframe
  - **Band** changed to channel for generalization in support of intermediate file output. Metadata description can also be used for intermediate output as well.
  - Various element attribute names expanded to make their meaning more obvious for reader legibility. Goal for xml is legibility and readability.

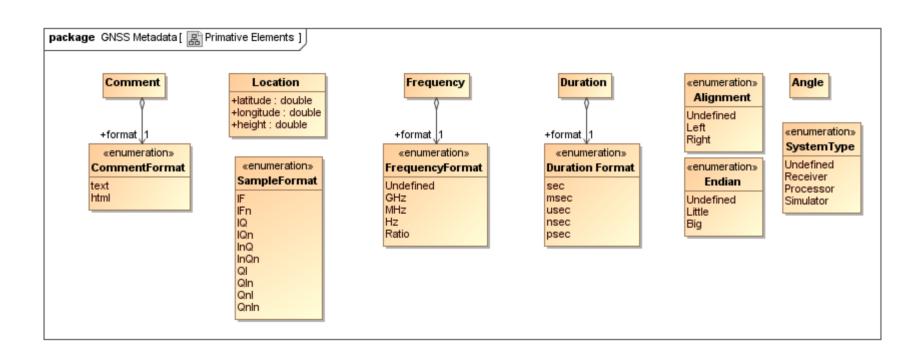
### Schema Changes

- Metadata files can include other metadata files allowing referencing of standard elements (e.g. channels, streams, system, etc.)
- References to previously defined elements is done by specifying the id. Plan is for referenced elements to be copied into the linked element.
- Inclusion (using the include element) of multiple files with references via 'id' field make it possible to support all complex multi-file configurations as well as a simplified single-file versions

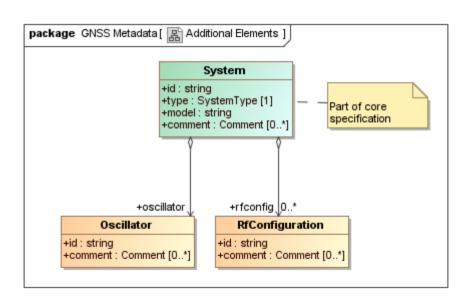
## **Core Conceptual Model**



### **Primative Elements**



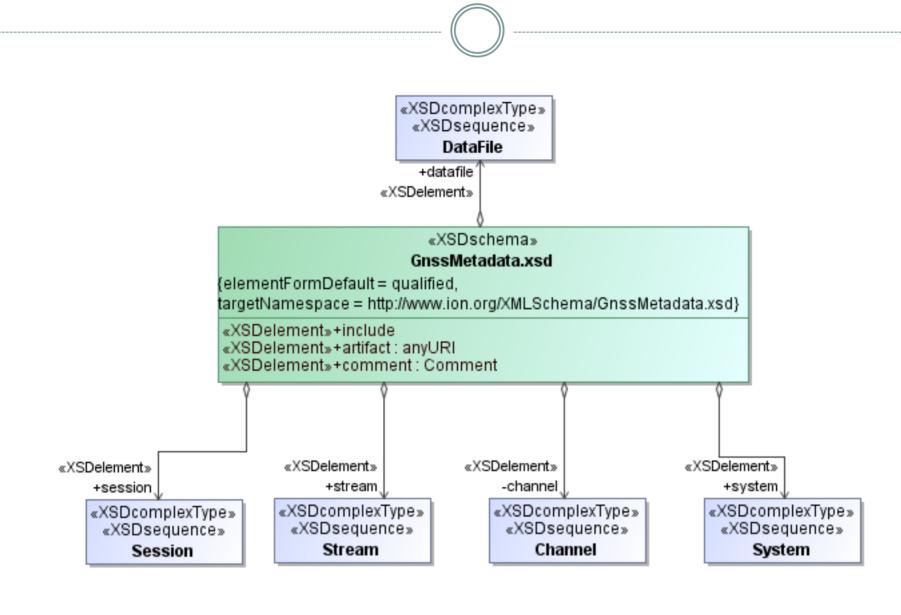
### **Additional Elements**



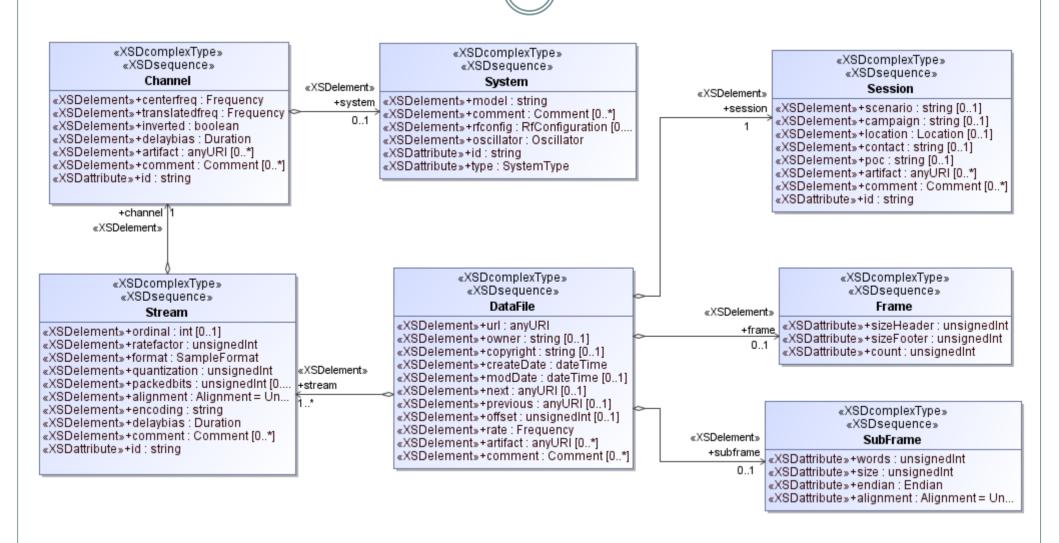
### XML Schema Model

- Following figures show the fully specified XML schema.
- Generated schema is available at
  - https://raw.githubusercontent.com/mbmathews/metadata/ma ster/schema/DraftGnssMetadata.xsd
- To test the schema and create templates
  - o <a href="http://xsd2xml.com">http://xsd2xml.com</a>
- To validate metadata xml using the schema
  - http://www.freeformatter.com/xml-validator-xsd.html

# Top-Level Schema



### **Core Elements**



# **Primative Types**



#### «XSDsimpleType» SampleFormat

«XSDenumeration»-InQ «XSDenumeration»-InQn «XSDenumeration»-QI «XSDenumeration»-Onl

«XSDenumeration»-IFn «XSDenumeration»-IQ

«XSDenumeration»-QIn

«XSDenumeration»-IF

«XSDenumeration»-QnIn «XSDenumeration»-IQn

#### «XSDsimpleType» FrequencyFormat

«XSDenumeration»-GHz

«XSDenumeration»-Undefined «XSDenumeration»-Hz

«XSDenumeration»-Ratio «XSDenumeration»-MHz

-format

«XSDattribute» /

«XSDcomplexType» «XSDsequence»

Frequency

#### «XSDsimpleType»

#### DurationFormat

«XSDenumeration»-nsec «XSDenumeration»-psec «XSDenumeration»-usec

«XSDenumeration»-msec

«XSDenumeration»-sec

-format «XSDattribute»

> «XSDcomplexType» «XSDsequence»

> > Duration

#### «XSDsimpleType»

#### CommentFormat

«XSDenumeration»-text «XSDenumeration»-html

-format «XSDattribute»

> «XSDcomplexType» «XSDsequence»

> > Comment

«XSDcomplexType» «XSDsequence»

#### Location

«XSDattribute»-lat : double «XSDattribute»-lon : double «XSDattribute»-height : double «XSDsimpleType»

#### **Endian**

«XSDenumeration»-Big «XSDenumeration»-Undefined «XSDenumeration»-Little

#### «XSDsimpleType»

#### SystemType

«XSDenumeration»-Receiver «XSDenumeration»-Processor «XSDenumeration»-Undefined «XSDenumeration»-Simulator

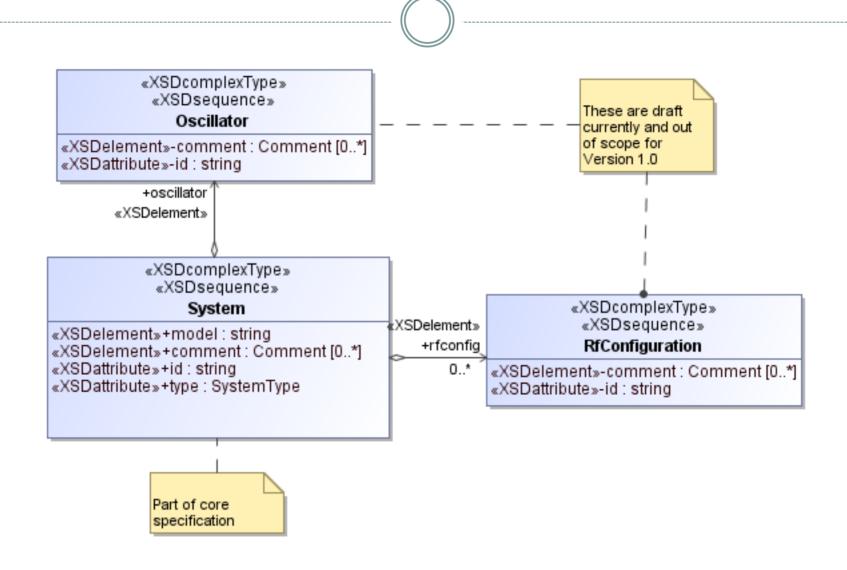
«XSDsimpleType»

#### Alignment

«XSDenumeration»-Right «XSDenumeration»-Left «XSDenumeration»-Undefined «XSDcomplexType» «XSDsequence»

Angle

# Additional Types



# Sample XML Template (Single File)

```
<?xml version="1.0" encoding="utf-8"?>
<datafile>
 <url>sdrdata bin</url>
 <owner>str1234</owner>
 <copyright>str1234</copyright>
 <stream id="str1234">
  <ordinal>123</ordinal>
  <ratefactor>123</ratefactor>
 <format>InQ</format>
  <quantization>123</quantization>
  <packedbits>123</packedbits>
  <alignment>Right</alignment>
 <encoding>str1234</encoding>
  <channel id="str1234">
   <centerfreq format="GHz"/>
   <translatedfreq format="GHz"/>
   <inverted>true</inverted>
   <delaybias format="nsec" />
   <artifact>http://www.xsd2xml.com</artifact>
   <comment format="text" />
   <system id="str1234" type="Receiver">
    <model>str1234</model>
   <comment format="text"/>
   <rfconfig id="str1234">
     <comment format="text" />
   </rfconfig>
    <oscillator id="str1234">
     <comment format="text" />
    </oscillator>
  </system>
  </channel>
```

```
<delaybias format="nsec" />
 <comment format="text" />
</stream>
<session id="str1234">
 <scenario>str1234</scenario>
 <campaign>str1234</campaign>
 <location lat="3.1415926535" lon="3.1415926535" height="3.1415926535" />
 <contact>str1234</contact>
 <poc>str1234</poc>
 <artifact>http://www.xsd2xml.com</artifact>
 <comment format="text"/>
</session>
<createDate>2012-12-13T12:12:12</createDate>
<modDate>2012-12-13T12:12:12</modDate>
<next>http://www.xsd2xml.com</next>
<previous>http://www.xsd2xml.com</previous>
<offset>123</offset>
<rate format="GHz"/>
<subframe words="123" size="123" endian="Big" alignment="Right" />
<frame sizeHeader="123" sizeFooter="123" count="123" />
<artifact>http://www.xsd2xml.com</artifact>
<comment format="text" />
</datafile>
```