FÓRUM Padrões OGC

OWS Common, GML, KML

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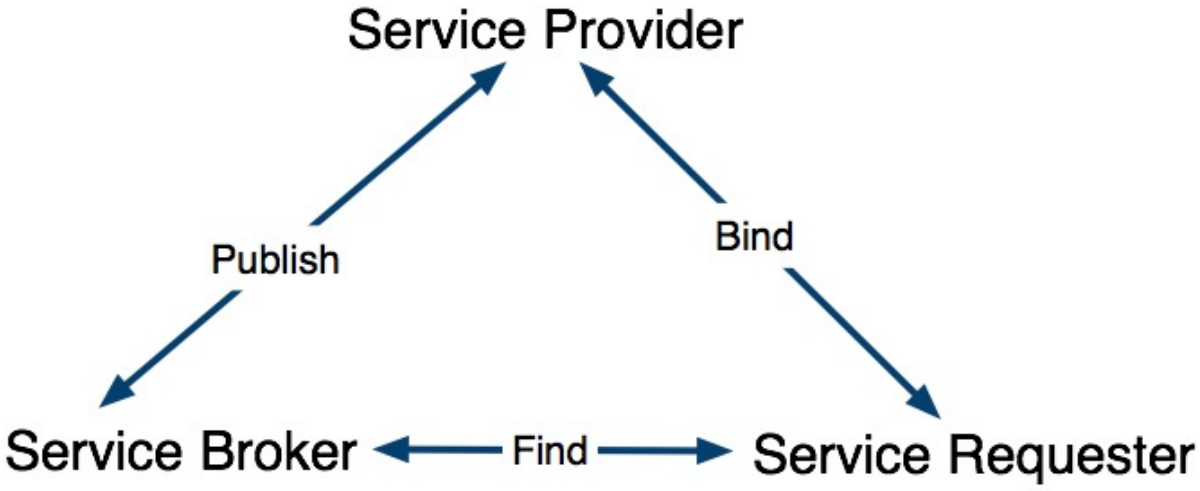
OGC Web Services



OWS Common

* GetCapabilities operation (request, parameters, response)
* Exception reports
* Operations parameters
    * Bounding box
    * Coordinate reference systems
    * Format parameters
    * Data descriptions
    * Multilingual text encoding
* Operation request and response encoding (HTTP GET and HTTP POST)
* Guidance for OWS Implementation Specifications

OWS Common

* Operations parameters
    * Bounding box
    * Coordinate reference systems
    * Format parameters
    * Data descriptions
    * Multilingual text encoding

OWS Common

* Operation request and response encoding (HTTP GET and HTTP POST)
* Guidance for OWS Implementation Specifications

OWS Common

http://www.example.com/wfsserver?
service=wfs&
version=1.1.0&
request=GetCapabilities

OWS Common

GetCapabilities Response:

http://inde.gov.br/?page_id=76

http://www.geoservicos.ibge.gov.br/geoserver/ows?service=wms&version=1.3.0&request=GetCapabilities

OGC Encodings

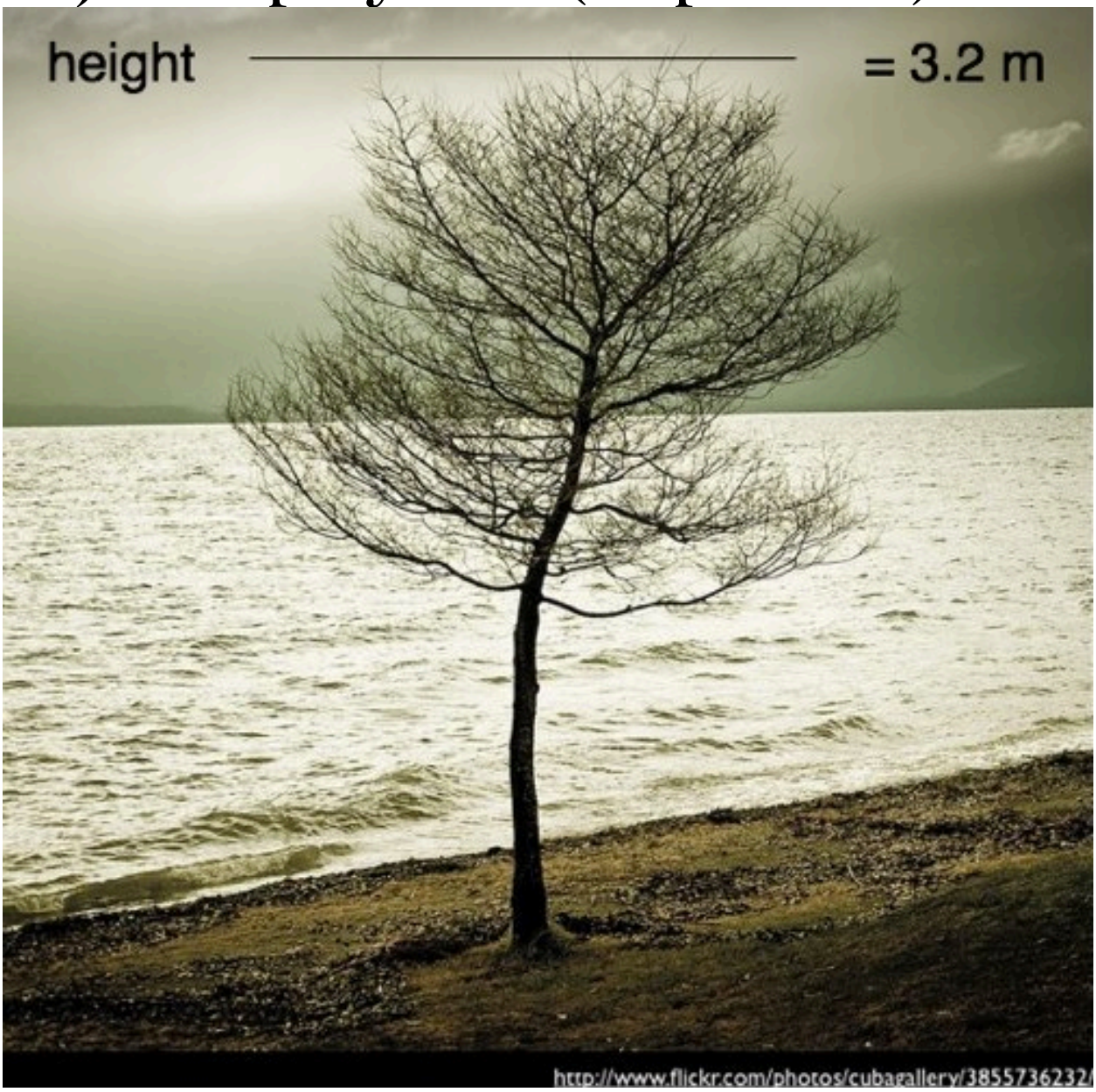
GML

Feature

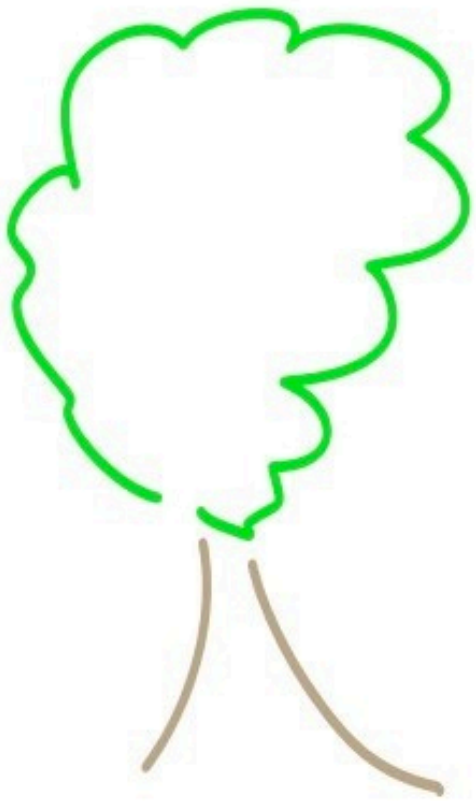
Feature (Entidade)

Geographic Feature

Object Property Value (Propriedades)



Feature Type



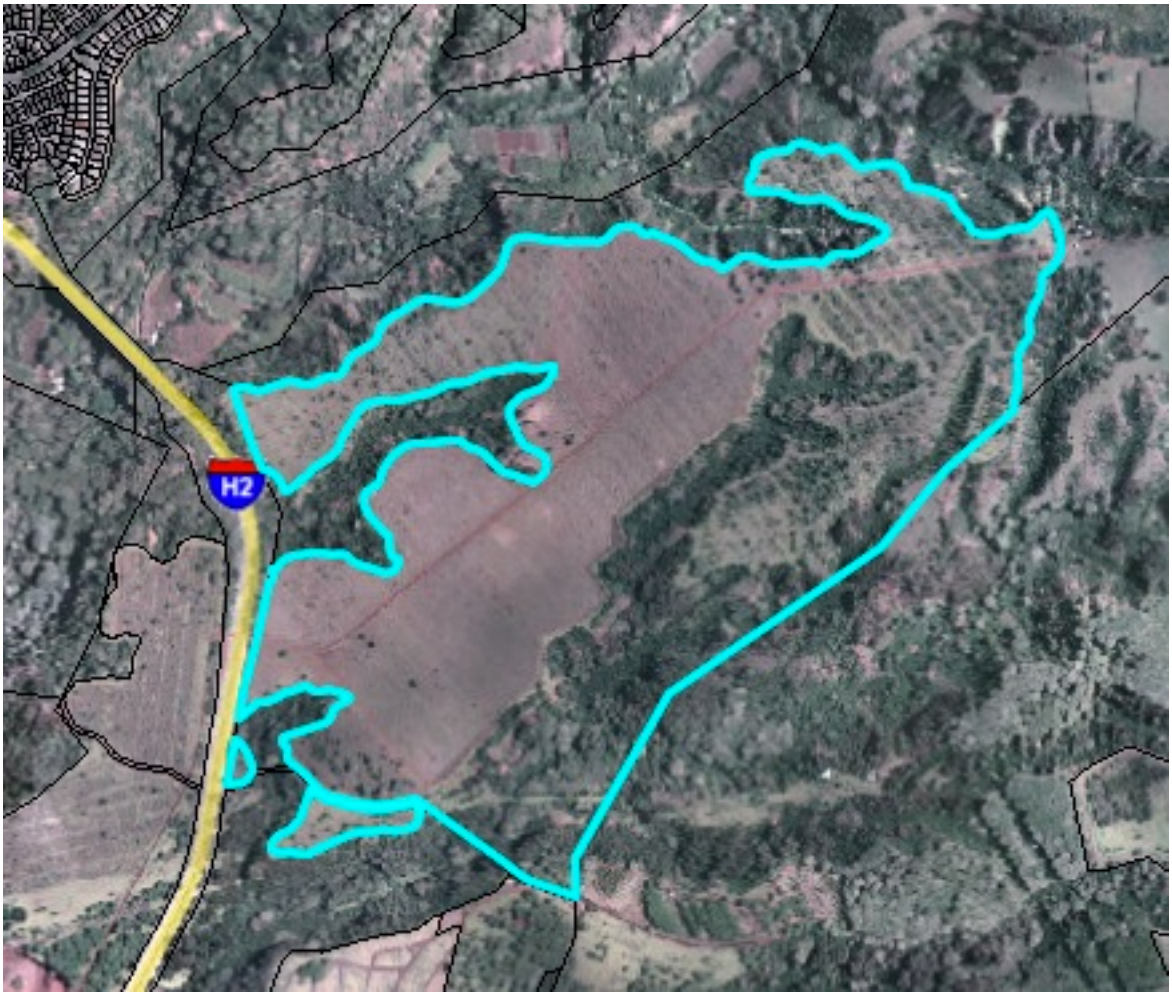
Class = Feature

Properties = Height, Location

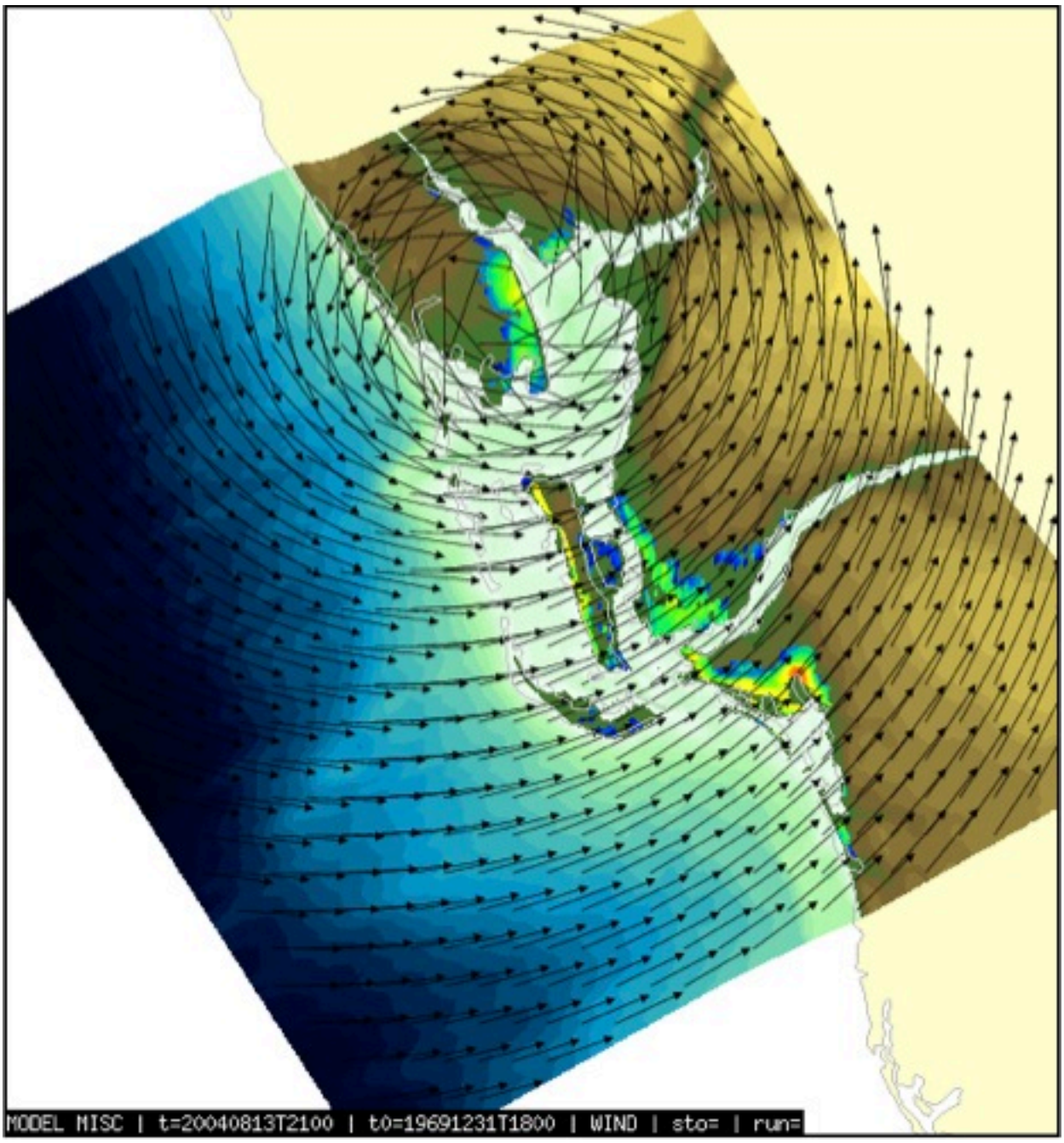
Feature Instance

My favorite tree in Cartagena in front of the hotel Colombia

Discrete Features



Continuous Features

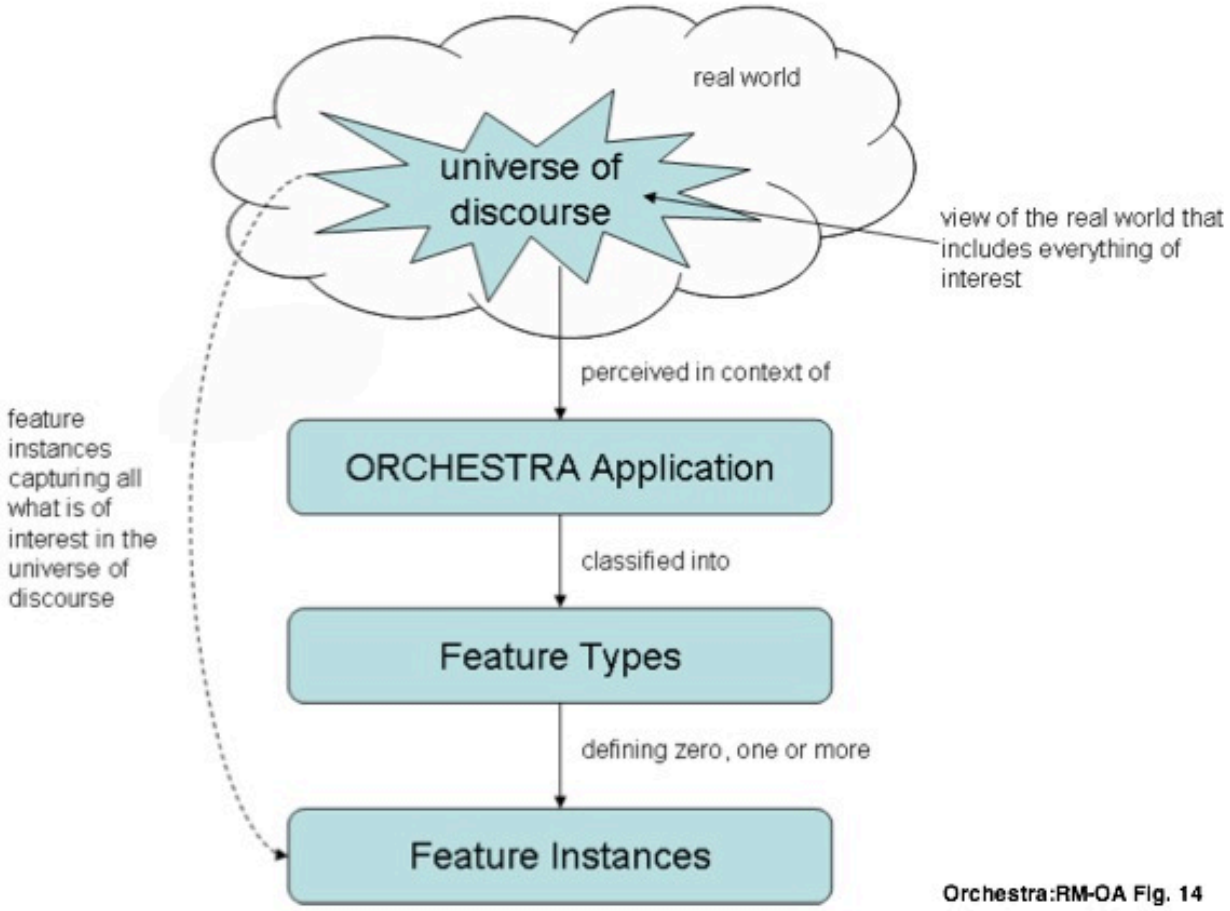


Location

geographic names
coordinates
linear referencing

World_Geodetic_System 84 (EPSG 4326)

Features Modeling

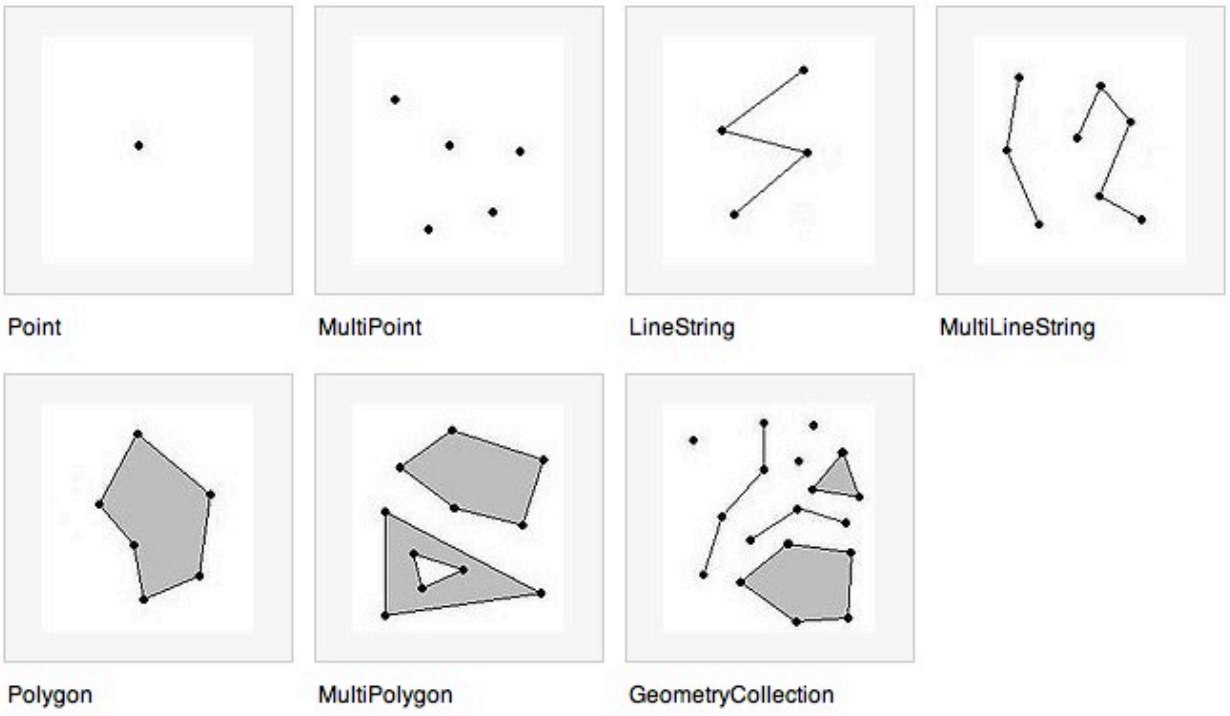


Orchestra:RM-OA Fig. 14

GML Bridge Example

```
<Bridge>
  <span>100</span>
  <height>200</height>
  <gml:centerLineOf>
    <gml:LineString>
      <gml:pos>100 200</gml:pos>
      <gml:pos>200 200</gml:pos>
    </gml:LineString>
  </gml:centerLineOf>
</Bridge>
```

Geometries


Point
MultiPoint
LineString
MultiLineString
Polygon
MultiPolygon
GeometryCollection

GML Flavors

* GML 2 : points, polygons and lineStrings

* GML 3 : + Curves, surfaces, coverages

* GML 3 Simple Feature profiles. Is a GML 3 that looks like GML 2.

GML Points

```
<gml:Point>
    <gml:pos>0 100</gml:pos>
</gml:Point>

<gml:Point>
    <gml:coordinates>0,100 </gml:coordinates>
</gml:Point>

<gml:Point>
    <gml:coord>0,100 </gml:coord>
</gml:Point>
```

GML Lines

```
     <gml:LineString gml:id="p21"
                srsName="http://www.opengis.net/def/crs/EPSG/
0/4326">
          <gml:posList dimension="2">
               45.67 88.56 55.56 89.44
           </gml:posList>
     </gml:LineString >
```

GML Polygons

```
<gml:Polygon>
    <gml:exterior>
        <gml:LinearRing>
            <gml:coordinates>…… </gml:coordinates>
        </gml:LinearRing>
    </gml:exterior>
    <gml:interior>
        <gml:LinearRing>
            <gml:coordinates>…… </gml:coordinates>
        </gml:LinearRing>
    </gml:interior>
</gml:Polygon>
```

GML Multi Geometries

Simple Feature Specification

* MultiPoint
* MultiCurve
* MultiSurface

GML Multiple Geometries

Radio Station - 3 different geometry fields.

* Point - in a country map
* Polygon - Transmition area
* Multi polygons - in a larges scale city map

You define a default geometry.

GML AbstractFeatureType

```
    <complexType name="AbstractFeatureType"
abstract="true">
    …
      <complexContent>
        <extension base="gml:AbstractGMLType">
          <sequence>
            <element ref="gml:boundedBy"
minOccurs="0"/>
            <element ref="gml:location" minOccurs="0"/>
           <!-- additional properties must be specified
                in an application schema -->
          </sequence>
        </extension>
      </complexContent>
```

GML Feature Collections

```
<element name="FeatureCollection"
    type="gml:FeatureCollectionType"
    substitutionGroup="gml:_Feature"/>
    <complexType name="FeatureCollectionType">
      <complexContent>
        <extension
base="gml:AbstractFeatureCollectionType"/>
      </complexContent>
    </complexType>
```

GML AbstractFeatureCollectionType

```
    <complexType name="AbstractFeatureCollectionType"
abstract="true">
        <annotation>
          <documentation>
            A feature collection contains zero
            or more features.
          </documentation>
        </annotation>
        <complexContent>
          <extension base="gml:BoundedFeatureType">
            <sequence>
              <element ref="gml:featureMember"
minOccurs="0"
                  maxOccurs="unbounded"/>
              <element ref="gml:featureMembers"
minOccurs="0"/>
            </sequence>
          </extension>
        </complexContent>
      </complexType>
```

GML BoundedFeatureType

```
      <complexType name="BoundedFeatureType"
abstract="true">
          <annotation>
             <documentation>
                Makes boundedBy mandatory -
                used to build Feature Collections
             </documentation>
          </annotation>
          <complexContent>
          <restriction base="gml:AbstractFeatureType">
             <sequence>
               <element ref="gml:metaDataProperty"
minOccurs="0"
                    maxOccurs="unbounded"/>
                <element ref="gml:description" minOccurs="0"/>
               <element ref="gml:name" minOccurs="0"
                  maxOccurs="unbounded"/>
                <element ref="gml:boundedBy"/>
                <element ref="gml:location" minOccurs="0"/>
             </sequence>
          </restriction>
          </complexContent>
       </complexType>
```

Communities Modeling via GML Aplication Schemas

* AIXM – Aviation
* CAAML – Canadian avalanches
* CityGML – 3D city models
* CSML – Climate Science Modelling
* DAFIF – Defense aviation
* GeoSciML - Geoscience

GML Bridge Example

```
<Bridge>
  <span>100</span>
  <height>200</height>
  <gml:centerLineOf>
    <gml:LineString>
      <gml:pos>100 200</gml:pos>
      <gml:pos>200 200</gml:pos>
    </gml:LineString>
  </gml:centerLineOf>
</Bridge>
```

GML Application Schema

```
<xs:schema targetNamespace="http://www.ibbb.org"
      xmlns=""
      xmlns:gml="http://www.opengis.net/gml"
      xmlns:xs="http://www.w3.org/2001/XMLSchema"
      elementFormDefault="qualified"
      attributeFormDefault="unqualified">
   ….
</schema>
```

GML Application Schema

```
<xs:complexType name="BridgeType">
     <xs:complexContent>
          <xs:extension base="gml:AbstractFeatureType">
               <xs:sequence>
            <xs:element name="span"
                type="xs:integer"/>
             <xs:element name="height"
                 type="xs:integer"/>
              <xs:element ref="gml:centerLineOf"/>
                  </xs:sequence>
               </xs:extension>
          </xs:complexContent>
 </xs:complexType>
```

GML Bridge Example

```
<Bridge>
  <span>100</span>
  <height>200</height>
  <gml:centerLineOf>
    <gml:LineString>
      <gml:pos>100 200</gml:pos>
      <gml:pos>200 200</gml:pos>
    </gml:LineString>
  </gml:centerLineOf>
</Bridge>
```

KML

KML

Open Geospatial Consortium Inc.

Date: 2008-04-14

Reference number of this OGC® project document: **OGC 07-147r2**

Version: 2.2.0

Category: OGC® Standard

Editor: Tim Wilson

OGC® KML

Used for

* Annotate the Earth

* Specify icons and labels to identify locations on the surface of the planet

* Create different camera positions to define unique views for KML features

* Define image overlays to attach to the ground or screen

* Define styles to specify KML feature appearance

Used for

* Write HTML descriptions of KML features, including hyperlinks and embedded images

* Organize KML features into hierarchies

* Locate and update retrieved KML documents from local or remote network locations

* Define the location and orientation of textured 3D objects

Example

```
<kml xmlns="http://www.opengis.net/kml/2.2">
  <Document>
    <name>Document.kml</name> <open>1</open>
    <Style id="exampleStyleDocument">
      <LabelStyle>
      <color>ff0000cc</color>
      </LabelStyle>
    </Style>
  <Placemark>
   <name>Document Feature 1</name> <styleUrl>#exampleStyleDocument</styleUrl>
      <Point>
      <coordinates>-122.371,37.816,0</coordinates>
    </Point>
  </Placemark>
  <Placemark>
    <name>Document Feature 2</name>
    <styleUrl>#exampleStyleDocument</styleUrl>
    <Point>
      <coordinates>-122.370,37.817,0</coordinates>
    </Point>
  </Placemark>
 </Document>
```

</kml>