

# DISTRIBUTED KNOWLEDGE MANAGEMENT (AND CREATION) WITH GEORSS

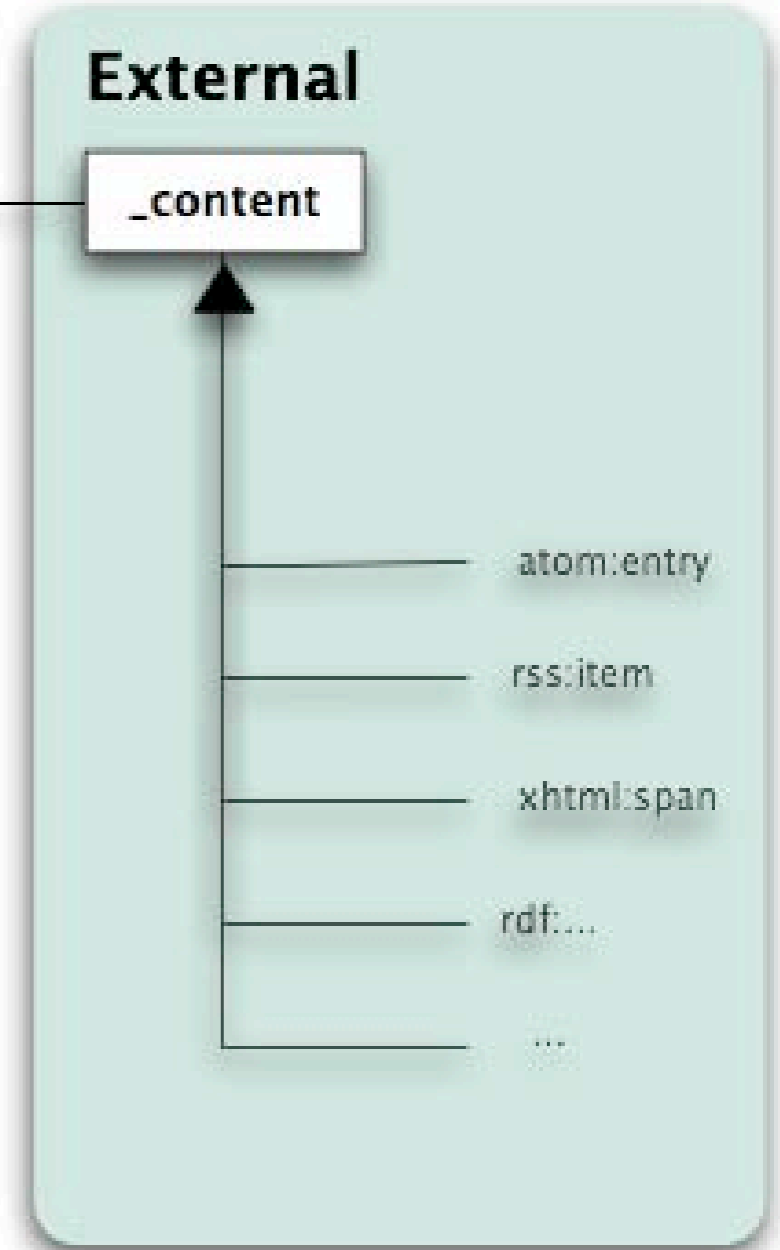
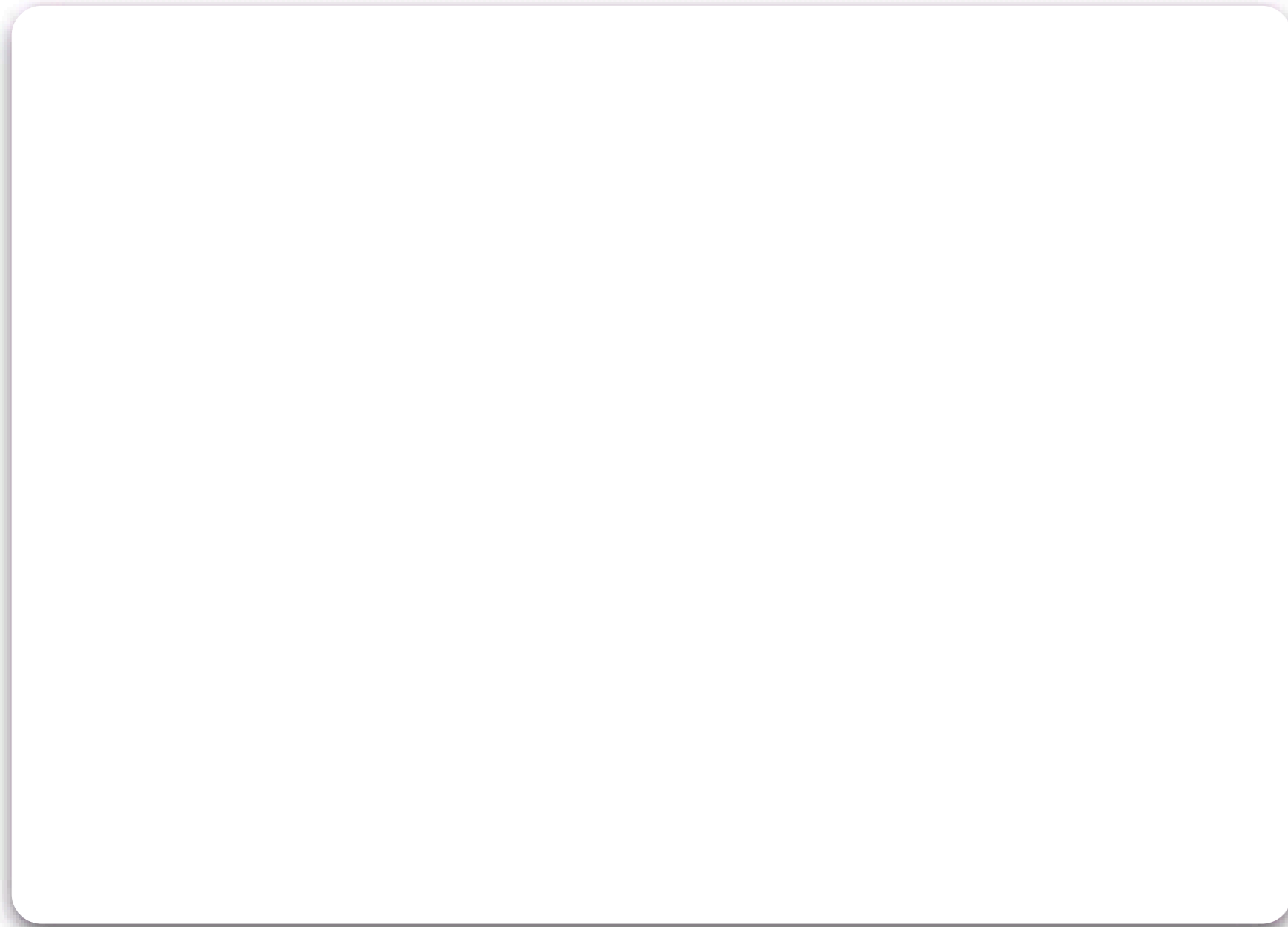
Josh Lieberman, Traverse Technologies Inc.



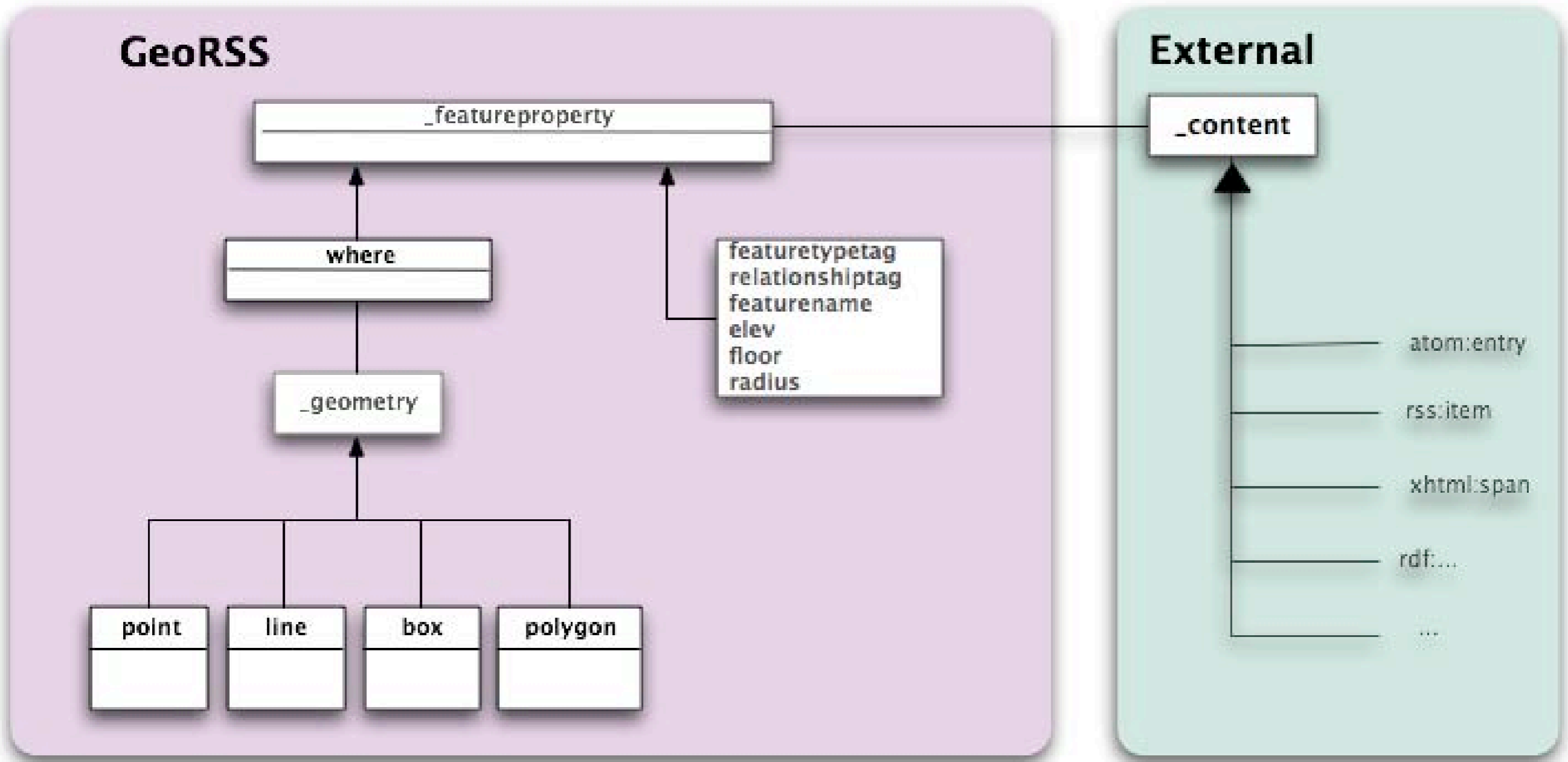
# SCOPE

- Conceptual view of GeoRSS - significance of this part of Web architecture
- Feed protocols and distributed knowledge management
- Featured information vs informed features
- GeoRSS as contributed resource association
- GeoRSS as spatiotemporal narrative
- GeoRSS for distributed resource update
- GeoRSS and discovery
- KML and GeoRSS: rivals or complements?

# GEORSS 1.0 CONTENT



# GEORSS 1.0 CONTENT



# GEORSS EXAMPLES

- **Simple**

- `<georss:point>45.256 -71.92</georss:point>`
- `<georss:line>45.256 -110.45 46.46 -109.48 43.84 -109.86</georss:line>`
- `<georss:polygon>`
- `45.256 -110.45 46.46 -109.48 43.84 -109.86 45.256 -110.45`
- `</georss:polygon>`
- `<georss:box>42.943 -71.032 43.039 -69.856</georss:box>`  
`<georss:featuretypeptag>city</georss:featuretypeptag>`  
`<georss:relationshipptag>is-contained-within</georss:relationshipptag>`

*(GeoRSS Simple maps directly*

*onto GeoRSS GML)*

- **GML**

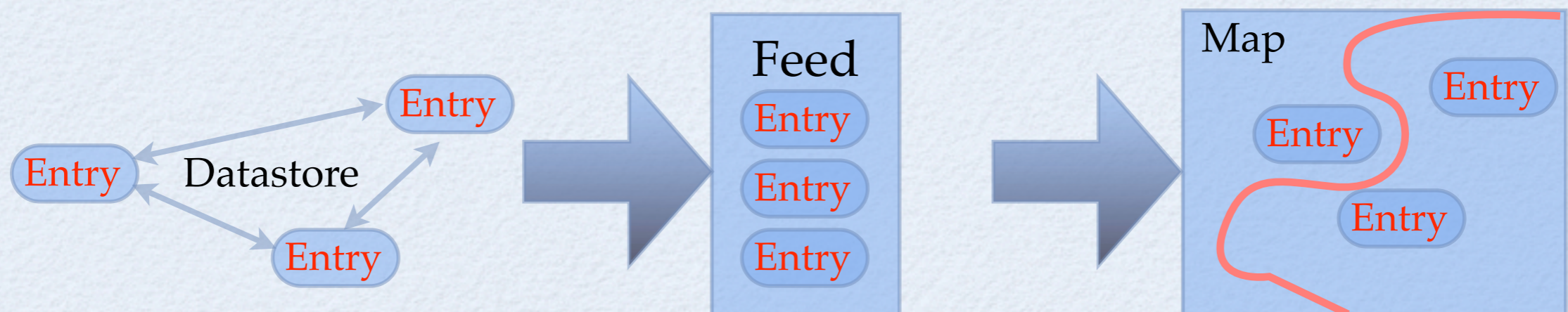
- `<georss:where>`
- `<gml:Point>`
- `<gml:pos>45.256 -71.92</gml:pos>`
- `</gml:Point>`
- `</georss:where>`
  
- `<georss:where>`
- `<gml:Polygon>`
- `<gml:exterior>`
- `<gml:LinearRing>`
- `<gml:posList>`
- `45.256 -110.45 46.46 -109.48 43.84 -109.86 45.256 -110.45`
- `</gml:posList>`
- `</gml:LinearRing>`
- `</gml:exterior>`
- `</gml:Polygon>`
- `</georss:where>`





# FEED PROTOCOLS

- HTTP GET - fetch feed as an XML document
- HTTP HEAD - check update headers to see if a feed has changed
- ATOM PUB - insert-update-delete entries in published feeds
- OpenSearch - URL-based simple query returning feeds
- WFS / PUBSUB - insert-update-delete entries & query / filter feeds
- Response format - return GeoRSS from any appropriate service operation
- “Push” notifications through XMPP or structured SMS



# FEATURE VS RESOURCE

- *General Feature Model / ISO 19107-19136: (Re) derive existing information from AbstractFeature to make geospatial data.*
- *GeoRSS: “featurize” resources, a new and independent geographic view of existing information*



# RESOURCE ASSOCIATIONS

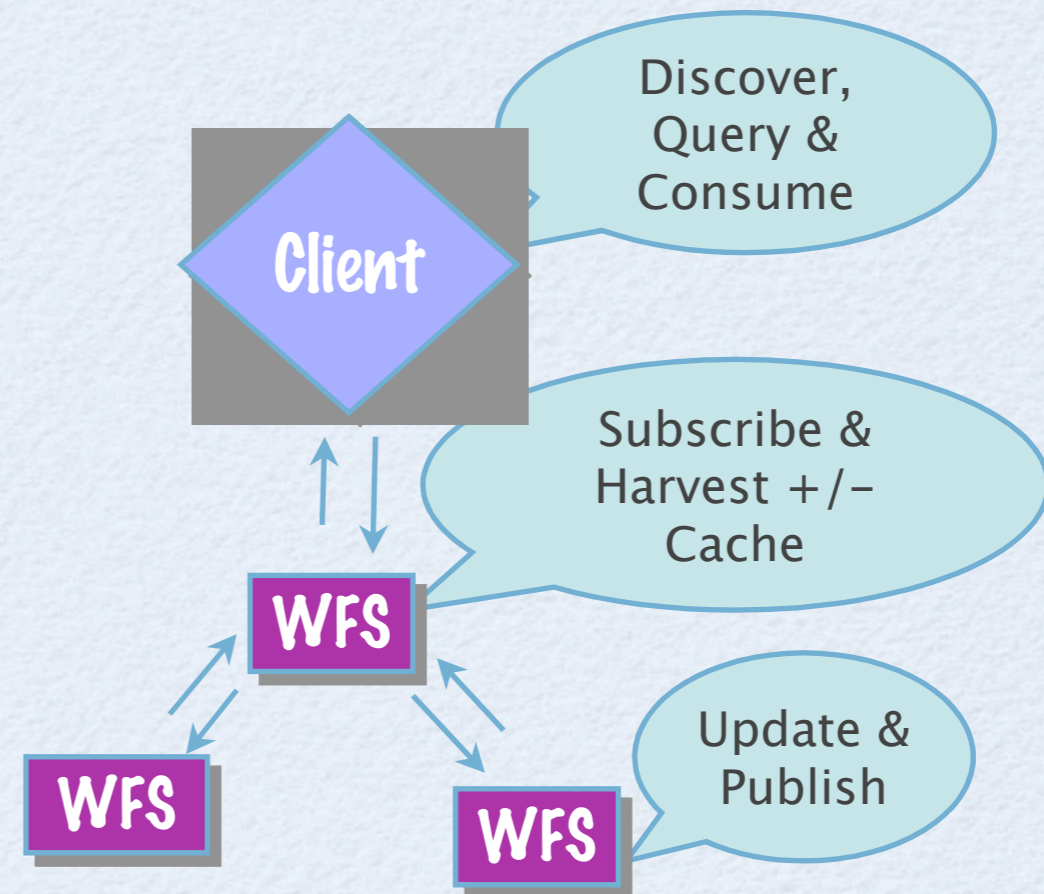
- Utilizes the atom:link element:
  - E.g.  
`<atom:link href="http://www.geobase.ca/domain" term="Queensland">`  
`<atom:link rel="georss:contains" href="http://www.geonames.org/Brisbane" />`
- Requires agreement on shared link relations
- Issue: how to reference another entry
  - `<atom:id />` is globally unique, but not an anchor
  - option to add (duplicate) `<atom:entry xml:id="..."`
  - extension (e.g. Atom threading extension) to add `ref` element for link internal to feed.
- Start with RCC8 relations which are (largely) computable

# FEED(ING) NARRATIVES

- Interest in describing the space (or spatiotemporal) trajectory - path - narrative of resources or parts of resources)
- Most flexible is to point at each “node” with an entry, then link one entry to another.
- `<atom:link />` flexibility in defining the relationships between nodes (prev - next - branch - ?)
- Narrative could also be a workflow...

# FEEDING MESSAGES AND FLOWING WORK: THE BIOLOGY OF LIVE DATA

- Use Case 1:  
Publish locally,  
access nationally

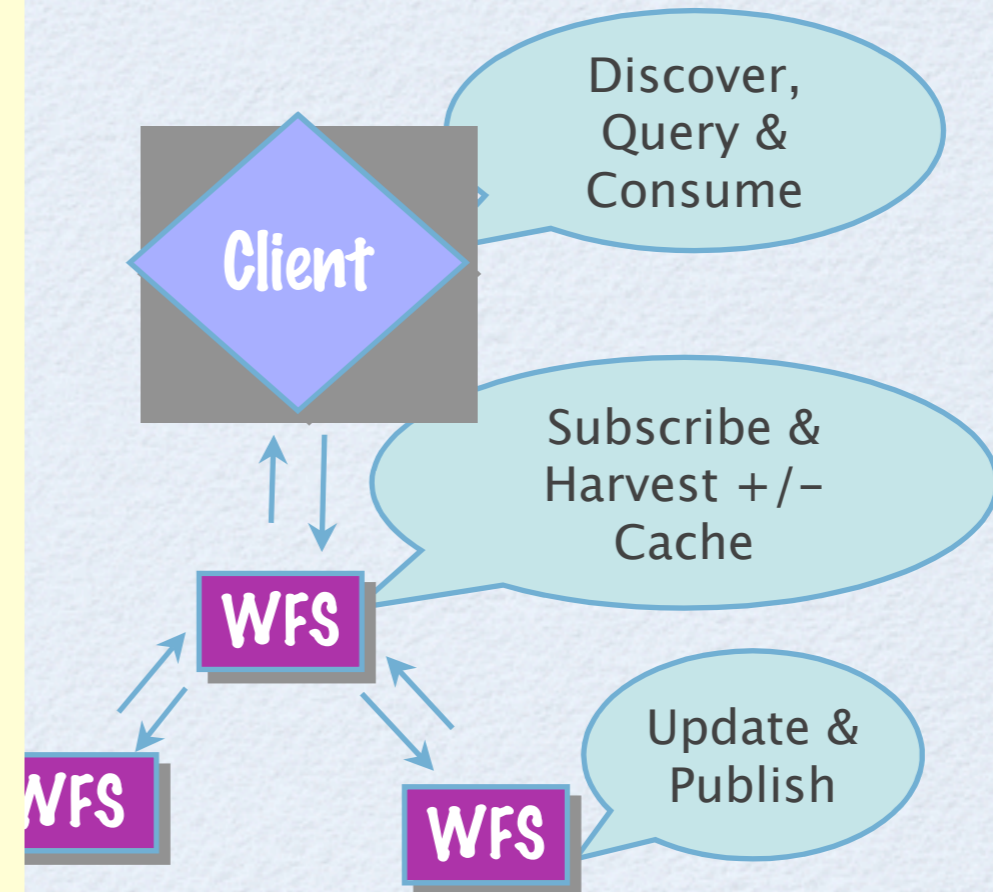


# S AND FLOWING GY OF LIVE DATA

Change Feed (Update Feed):

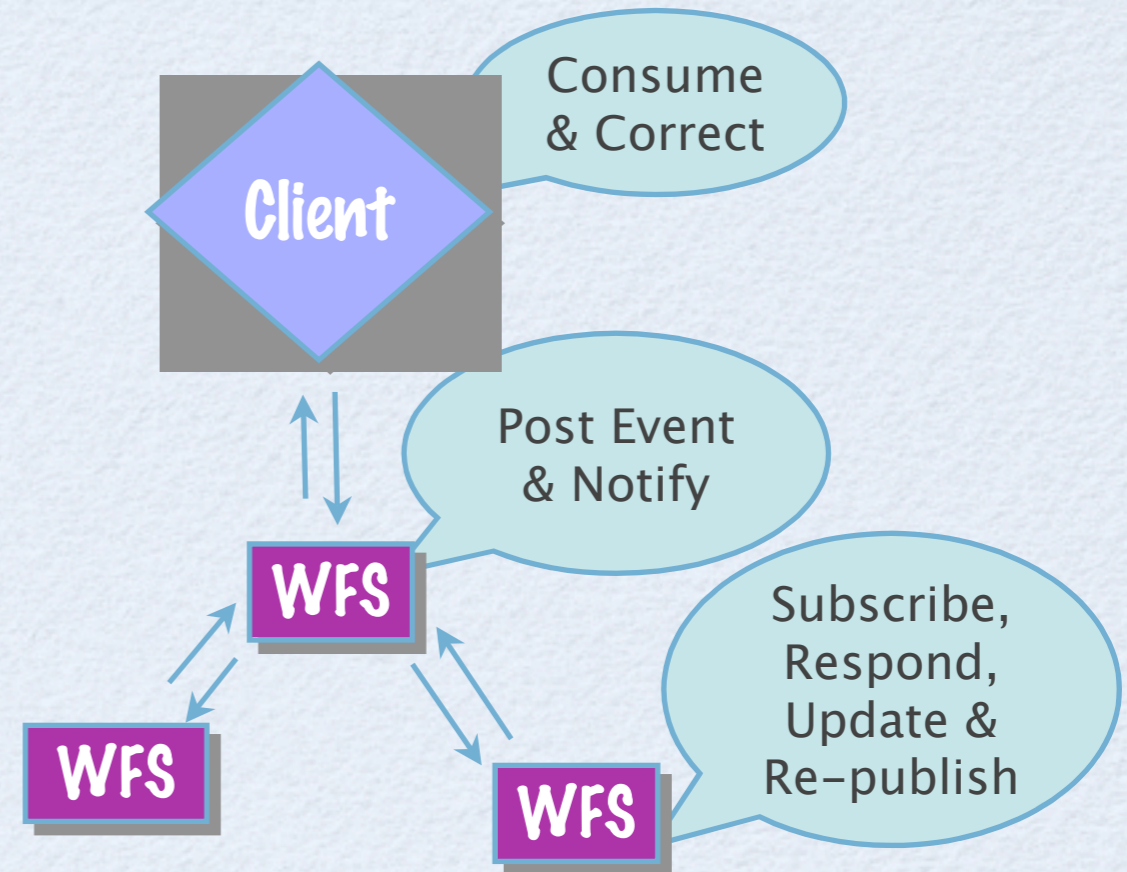
```
<verbatim>
<?xml version="1.0" encoding="utf-8"?>
<feed xmlns="http://www.w3.org/2005/Atom" xmlns:georss="http://www.georss.org" xmlns:gb="http://
www.geobase.ca/interop-pilot-2007" xmlns:gml="http://www.opengis.net/gmlsf">
  <title>Geobase Feedback</title>
  <category term="feedback">
  <link href="http://www.geobase.ca/feedback"/>
  <updated>2003-12-13T18:30:02Z</updated>
  <author>
    <name>John Doe</name>
    <email>jdoe@geobase.ca</email>
  </author>
  <generator>Cubeserv</generator>
  <id>urn:uuid:60a76c80-d399-11d9-b93C-0003939e0af6</id>

  <entry>
    <title>Correction to Brisbane placename feature</title>
    <author>
      <name>John Doe</name>
      <uri>http://www.johndoe.com</uri>
      <email>jdoe@johndoe.com</email>
    </author>
    <category scheme="http://www.geobase.ca/feedtype" term="feedback">
    <category scheme="http://www.geobase.ca/domain" term="Tasmania">
    <category scheme="http://www.geobase.ca/featuretype" term="placename">
    <category scheme="http://www.geobase.ca/action" term="update">
    <category scheme="http://www.geobase.ca/status" term="published">
    <link rel="http://www.geobase.ca/linktype/sourcefeature" href="http://wfs.geobase.ca?request=GetFeature..."/>
    <link rel="http://www.geobase.ca/linktype/feedback" href="" />
    <link rel="alternate" href="http://www.geonames.org/Brisbane"/>
    <id>urn:uuid:1225c695-cfb8-4ebb-aaaa-80da344efa6a</id>
    <updated>2003-12-13T18:30:02Z</updated>
    <summary>Update of Brisbane placename feature</summary>
    <content>Extended description of feedback and evidence</content>
    <georss:where>
      <gml:Point>
        <gml:poslist>143.5165125 -42.13445</gml:poslist>
      </gml:Point>
    </georss:where>
    <georss:featureOfInterest>
      <gml:FeatureCollection >
        <gml:featureMember>
          <topp:tasmania_cities>
            <topp:the_geom>
              <gml:MultiPoint srsName="epsg:4326">
                <gml:pointMember>
                  <gml:Point>
                    <gml:poslist>143.5165125 -42.13445</gml:poslist>
                  </gml:Point>
                </gml:pointMember>
              </gml:MultiPoint>
            </topp:the_geom>
            <topp:CITY_NAME>Brisbane</topp:CITY_NAME>
            <topp:ADMIN_NAME>Tasmania</topp:ADMIN_NAME>
            <topp:CNTRY_NAME>Australia</topp:CNTRY_NAME>
            <topp:STATUS>Provincial capital</topp:STATUS>
            <topp:POP_CLASS></topp:POP_CLASS>
          </topp:tasmania_cities>
        </gml:featureMember>
      </gml:FeatureCollection>
    </georss:featureOfInterest>
  </entry>
</feed>
</verbatim>
```



# FEEDING MESSAGES AND FLOWING WORK: THE BIOLOGY OF LIVE DATA

- Use Case 2:  
Consume and  
comment  
nationally,  
respond and  
update locally

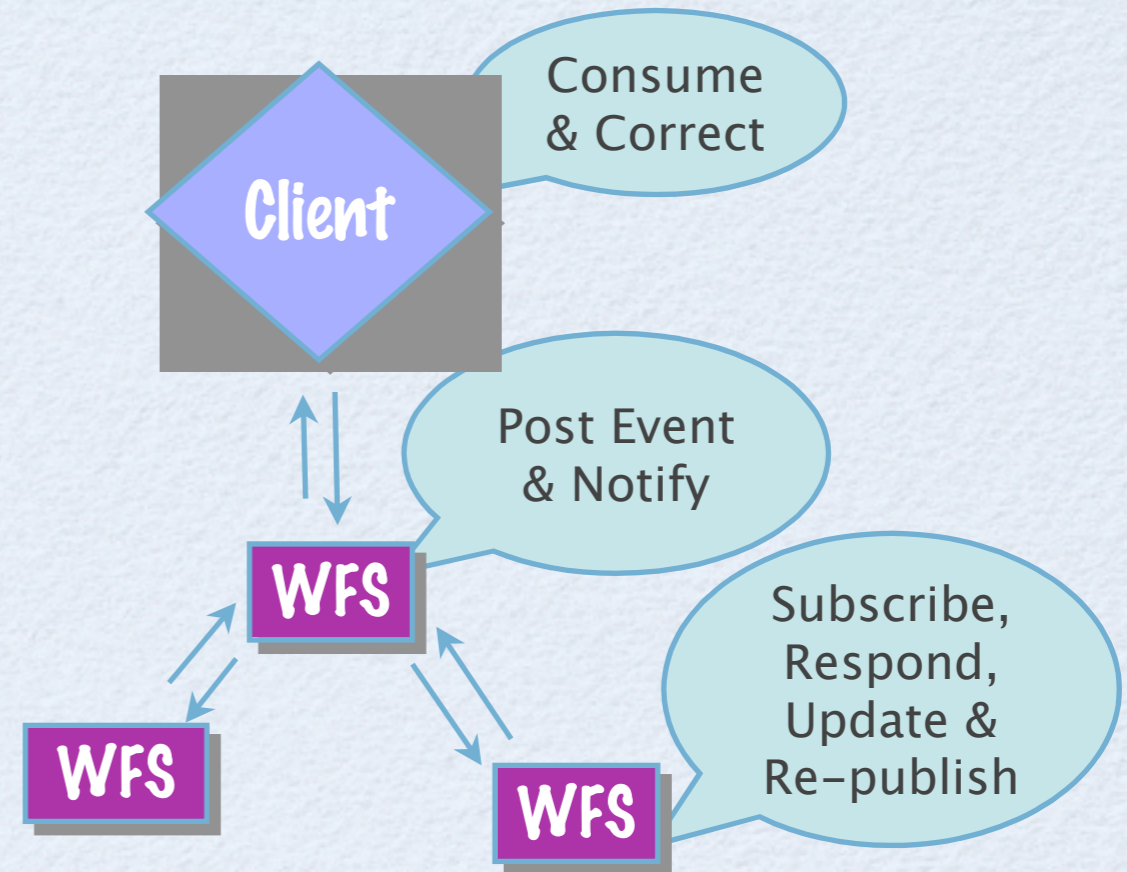


# ES AND FLOWING OGY OF LIVE DATA

Change Feed (Feedback Feed):

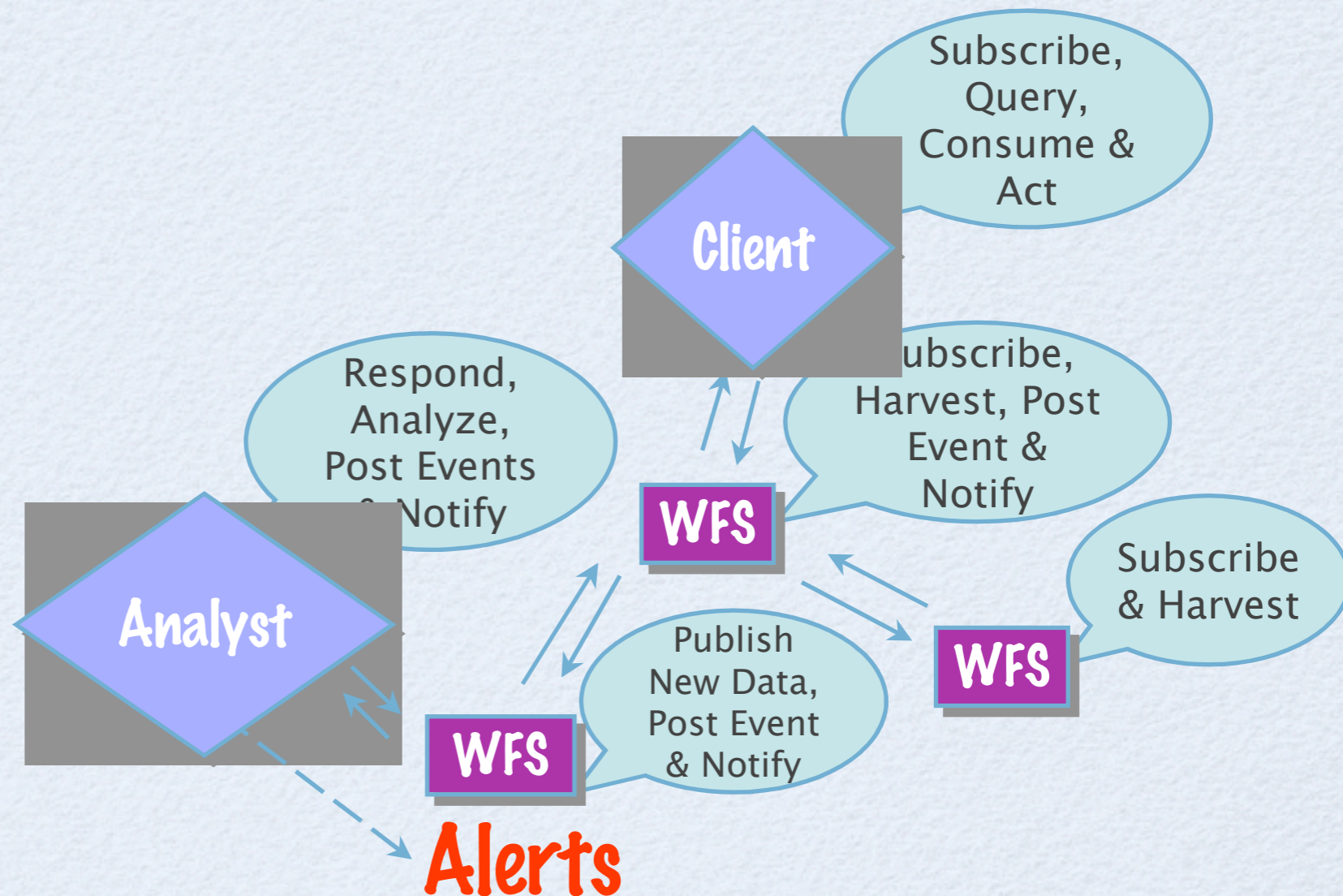
```
<verbatim>
<?xml version="1.0" encoding="utf-8"?>
<feed xmlns="http://www.w3.org/2005/Atom" xmlns:georss="http://www.georss.org" xmlns:gb="http://www.geobase.ca/interop-pilot-2007" xmlns:gml="http://www.opengis.net/gmlsf">
  <title>Geobase Feedback</title>
  <category term="feedback">
  <link href="http://www.geobase.ca/feedback"/>
  <updated>2003-12-13T18:30:02Z</updated>
  <author>
    <name>John Doe</name>
    <email>jdoe@geobase.ca</email>
  </author>
  <generator>Cubeserv</generator>
  <id>urn:uuid:60a76c80-d399-11d9-b93C-0003939e0af6</id>

  <entry>
    <title>Correction to Brisbane placename feature</title>
    <author>
      <name>John Doe</name>
      <uri>http://www.johndoe.com</uri>
      <email>jdoe@johndoe.com</email>
    </author>
    <category scheme="http://www.geobase.ca/feedtype" term="feedback">
    <category scheme="http://www.geobase.ca/domain" term="Tasmania">
    <category scheme="http://www.geobase.ca/featuretype" term="placename">
    <category scheme="http://www.geobase.ca/action" term="update">
    <category scheme="http://www.geobase.ca/status" term="published">
    <link rel="http://www.geobase.ca/linktype/sourcefeature" href="http://wfs.geobase.ca?request=GetFeature..." />
    <link rel="http://www.geobase.ca/linktype/feedback" href="" />
    <link rel="alternate" href="http://www.geonames.org/Brisbane" />
    <id>urn:uuid:1225c695-cfb8-4ebb-aaaa-80da344efa6a</id>
    <updated>2003-12-13T18:30:02Z</updated>
    <summary>Update of Brisbane placename feature</summary>
    <content>Extended description of feedback and evidence</content>
    <georss:where>
      <gml:Point>
        <gml:poslist>143.5165125 -42.13445</gml:poslist>
      </gml:Point>
    </georss:where>
    <georss:featureOfInterest>
      <gml:FeatureCollection >
        <gml:featureMember>
          <topp:tasmania_cities>
            <topp:the_geom>
              <gml:MultiPoint srsName="epsg:4326">
                <gml:pointMember>
                  <gml:Point>
                    <gml:poslist>143.5165125 -42.13445</gml:poslist>
                  </gml:Point>
                </gml:pointMember>
              </gml:MultiPoint>
            </topp:the_geom>
            <topp:CITY_NAME>Brisbane</topp:CITY_NAME>
            <topp:ADMIN_NAME>Tasmania</topp:ADMIN_NAME>
            <topp:CNTRY_NAME>Australia</topp:CNTRY_NAME>
            <topp:STATUS>Provincial capital</topp:STATUS>
            <topp:POP_CLASS></topp:POP_CLASS>
          </topp:tasmania_cities>
        </gml:featureMember>
      </gml:FeatureCollection>
    </georss:featureOfInterest>
  </entry>
</feed>
</verbatim>
```



# FEEDING MESSAGES AND FLOWING WORK: THE BIOLOGY OF LIVE DATA

- Use Case 3:  
Analyze and publish locally, notify, consume, act regionally / nationally



Change Feed (Event Feed):

```

<verbatim>
<?xml version="1.0" encoding="utf-8"?>
<feed xmlns="http://www.w3.org/2005/Atom" xmlns:georss="http://www.georss.org" xmlns:gb="http://www.geobase.ca/
interop-pilot-2007" xmlns:gml="http://www.opengis.net/gmlsf">
<title>Geobase Event Notification</title>
<category term="event">
<link href="http://www.geobase.ca/event.rss"/>
<updated>2003-12-13T18:30:02Z</updated>
<author>
<name>John Doe</name>
<email>jdoe@geobase.ca</email>
</author>
<generator>Cubeserv</generator>
<id>urn:uuid:60a76c80-d399-11d9-b93C-0003939e0af6</id>

```

```

<entry>
<title>New Brisbane evacuation feature</title>
<author>
<name>John Doe</name>
<uri>http://www.johndoe.com</uri>
<email>jdoe@johndoe.com</email>
</author>
<category scheme="http://www.geobase.ca/feedtype" term="event">
<category scheme="http://www.geobase.ca/domain" term="Tasmania">
<category scheme="http://www.geobase.ca/featuretype" term="area_alert">
<category scheme="http://www.geobase.ca/action" term="alert">
<category scheme="http://www.geobase.ca/status" term="published">
<link rel="http://www.geobase.ca/linktype/ows_context" href="http://csw.geobase.ca?request=GetRecord..." />
<link rel="http://www.geobase.ca/linktype/eventfeature" href="http://wfs.geobase.sk.ca?request=GetFeature" />
<link rel="alternate" href="http://www.em.org/Brisbane023420208.cap" />
<id>urn:uuid:1225c695-cfb8-4ebb-aaaa-80da344efa6a</id>
<updated>2003-12-13T18:30:02Z</updated>
<summary>Evacuation notice for Brisbane area</summary>
<content>Feature collection indicating time and place of evacuation actions due to too much sun exposure</content>
<georss:where>
<gml:Point>
<gml:poslist>143.5165125 -42.13445</gml:poslist>
</gml:Point>
</georss:where>
<georss:featureContext xmlns="http://www.opengis.net/oc">
<oc:<OWSContext/>
</georss:featureContext>
<georss:featureOfInterest>

```

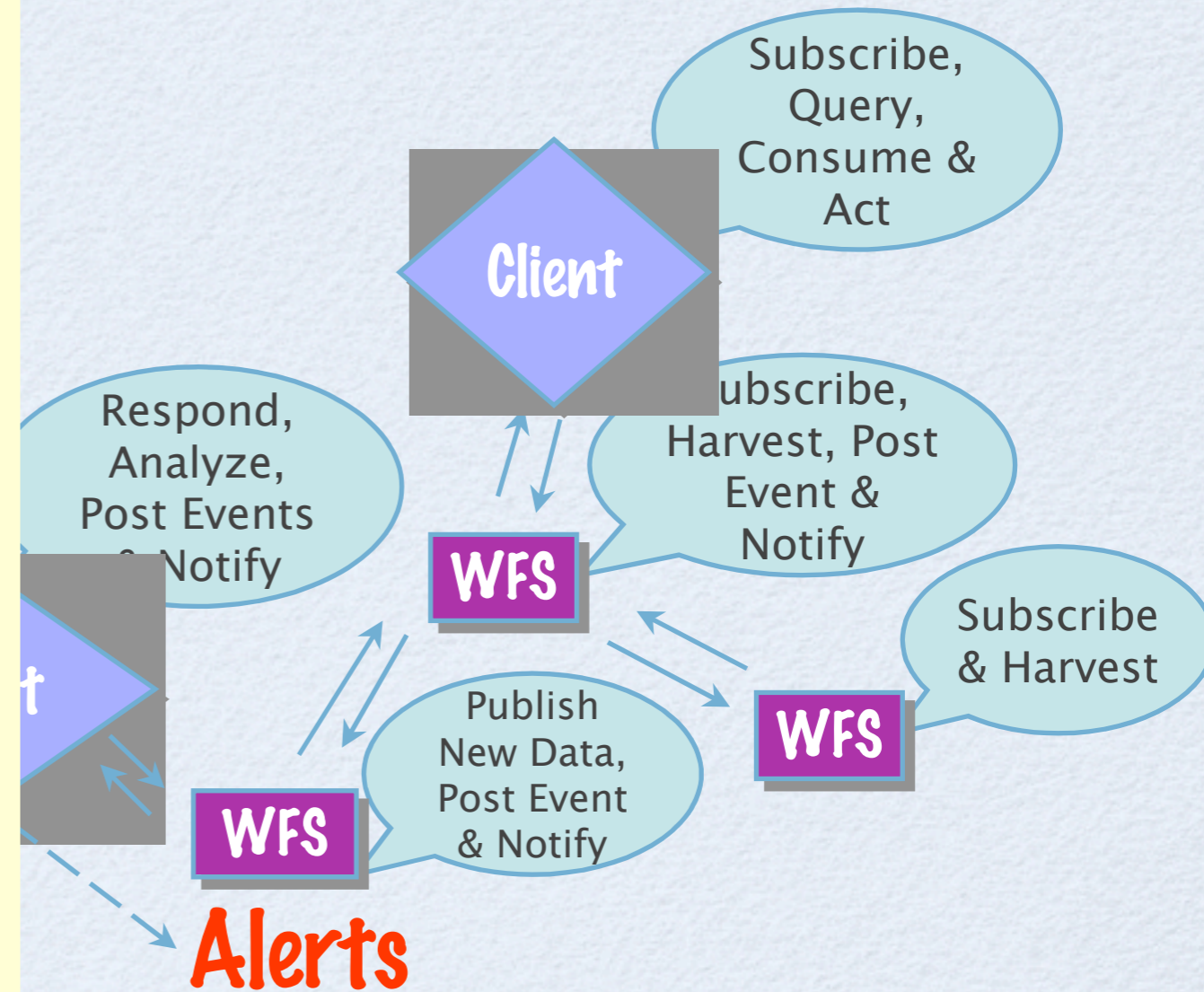
```

</georss:featureOfInterest>
<cap:alert xmlns:cap="urn:oasis:names:tc:emergency:cap:1.1">
<cap:identifier>NOAA-OIL-SPILL-20060811UTC073015</identifier>
<cap:sender>
oil.spill@testing.noaa.gov</sender>
<cap:sent>2006-08-11T07:30:15-00:00</sent>
<cap:status>Actual</status>
<cap:msgType>Alert</msgType>
<cap:scope>Public</scope>
<cap:note>Original alert from Philippines Department of Health</note>
<cap:info>
<cap:category>Env</category>
<cap:event>Oil Spill</event>
<cap:responseType>Execute</responseType>

<cap:urgency>Immediate</urgency>
<cap:severity>Severe</severity>
<cap:certainty>Observed</certainty>
<cap:senderName>Office of Response and Restoration, National Ocean Service, NOAA</senderName>
<cap:headline>Oil tanker sinking - Phillipines</headline>
<cap:description>In the afternoon of 11 August 2006, the oil tanker SOLAR 1 sank in rough sea conditions
approximately 30 nautical miles south southwest of Iloilo City in the Guimaras Straits, Western Visayas, Philippines. 18 of the 20
crew members survived the incident, but two remain missing. The vessel had been chartered by Petron Corporation to transport

```

# ISSUES AND FLOWING OF LIVE DATA



# GEORSS AND DISCOVERY

- Many search and discovery services / applications can now return GeoRSS-formatted results.
- OpenSearch: specification for defining simple URL-based search invocations. Most commonly used for text-box queries through browsers.
- Geosearch - developing agreement on OpenSearch geo parameters `bbox(lon,lat,lon,lat)` and `circle(lat,lon,radius)` as KVP or text tags

```
<?xml version="1.0" encoding="UTF-8"?>
<OpenSearchDescription xmlns="http://a9.com/-/spec/opensearch/1.1/">
  <ShortName>Web Search</ShortName>
  <Description>Use Example.com to search the Web.</Description>
  <Tags>example web</Tags>
  <Contact>admin@example.com</Contact>
  <Url type="application/rss+xml"
    template="http://example.com/?
q={searchTerms}&pw={startPage?}&format=rss" />
</OpenSearchDescription>
```

```
<Url type="application/xhtml+xml"
  indexOffset="0"
  template="http://example.com/search?
q={searchTerms}&start={startIndex?}" />
```

```
<opensearch:totalResults>3493</opensearch:totalResults>
  <opensearch:startIndex>0</opensearch:startIndex>
<opensearch:itemsPerPage>20</opensearch:itemsPerPage>
```



# TIME

- Atom time:
  - `<updated>2003-12-13T18:30:02Z</updated>`
  - Relates more to publication or entry update time, not the feature extent
- xCal:
  - `DTSTART:19970714T170000Z`
  - `DTEND:19970715T035959Z`
  - Not clear what event the time specification applies to
- Georss:when
  - Specific to time extent of georss geometry tag
  - GeoRSS Simple and GML forms

## Duration:

```
<georss:duration>2006-06-16T07:45:00.000Z 2006-06-16T07:45:00.000Z</georss:duration>
```

-or-

```
<georss:when>  
  <gml:TimePeriod >  
    <gml:beginPosition>2006-06-16T07:45:00.000Z</  
gml:beginPosition>  
    <gml:endPosition>2006-06-16T07:45:00.000Z</  
gml:endPosition>  
  </gml:TimePeriod>  
</georss:when>
```

## Instant:

```
<georss:instant>2003-02-13T12:28-08:00</  
georss:instant>
```

```
<georss:when>  
  <gml:TimeInstant>  
    <gml:timePosition>2003-02-13T12:28-08:00</  
gml:timePosition>  
  </gml:TimeInstant>  
</georss:when>
```

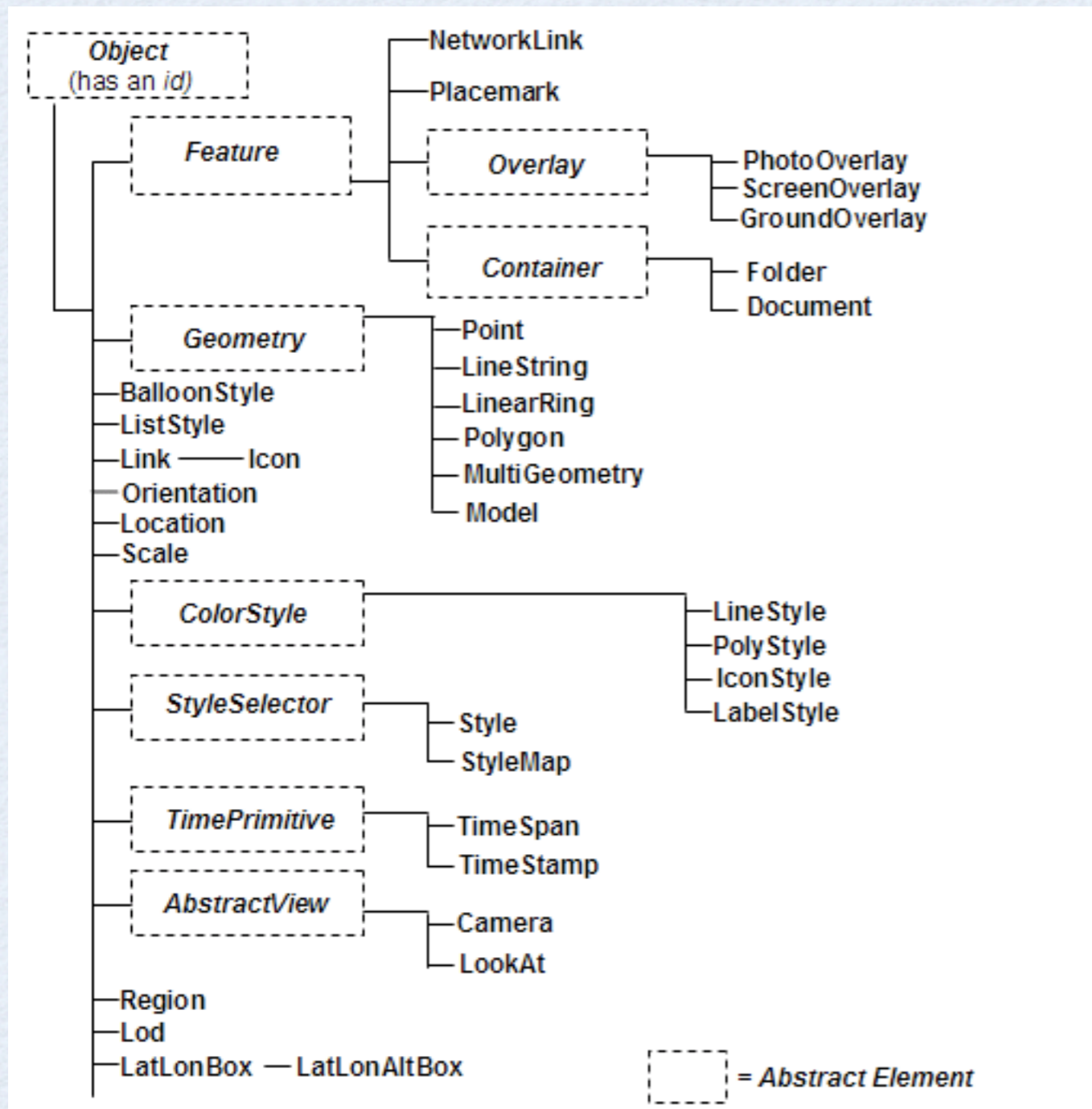
# WHAT'S UP FOR GEORSS 2.0

- Additions: georss:when / georss:instant / georss:duration
- Practices: `<entry xml:id="urn:uuid:1225c695-cfb8-4ebb-aaaa-80da344efa6a" />`
- Agreements:
  - Classification schemes for applications
    - Resource type
    - Resource usage
  - Link relations and types
    - Relationships between resources
    - Alternative representations

# KML VS GEORSS

- KML - focus on visualization of resources
- GeoRSS - focus on tagging and linking between resources
- Both are valuable for making information more searchable
- KML + GeoAtom is useful for search and visualization

# KML ELEMENTS AND QUESTS



```

<kml xmlns="http://www.opengis.net/kml/2.2"
      xmlns:atom="http://www.w3.org/2005/Atom">
  <Document>
    <atom:author>
      <atom:name>J. K. Rowling</atom:name>
    </atom:author>
    <atom:link href="http://www.harrypotter.com" />
    <Placemark>
      <name>Hogwarts</name>
      <Point>
        <coordinates>1,1</coordinates>
      </Point>
    </Placemark>
    <Placemark>
      <name>Little Hangleton</name>
      <Point>
        <coordinates>1,2</coordinates>
      </Point>
    </Placemark>
  </Document>
</kml>
  
```

# THOUGHTS ?

- Portable information “packets” on the Web
- Communal knowledge creation by Web “reification”
- Publish-subscribe machine interactions
- How do we tag ambiguity versus omission?
- Standards process for GeoRSS?
- What is missing?