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The WCS 2.0 Draft

70th OGC Technical Committee
Darmstadt, Germany
Peter Baumann
September 30, 2009

WCS 2.0: Rationales

- Decision in 2007: WCS to be revamped
  - 1.1 perceived as complex (we'd call it „more complete", though)
- design goals
  - Easy to handle
  - harmonization with GML coverage model
  - Allow use of WCS coverages without WCS (again, harmonization)
  - Better suited for core/extension model
  - Formally stated testable requirements in the sense of the Policy doc
  - best: formal specification
- …all this made it impossible to be backwards compatible
  - Therefore, 1.2 $\rightarrow$2.0

Issues encountered

- Overall GML.SWG did excellent work
  - coverage model is crisp and clear

But:

- GML coverages not documented as UML
  - Had to produce UML, to be verified by GML.SWG
- Items missing in GML
  - Ex: null values, interpolation indicator
- Intended use sometimes unclear in GML
  - Sometimes under debate in GML.SWG
  - Ex: RangeSet
- GML in flux: some relevant CRs on GML.SWG's table

Design Decisions

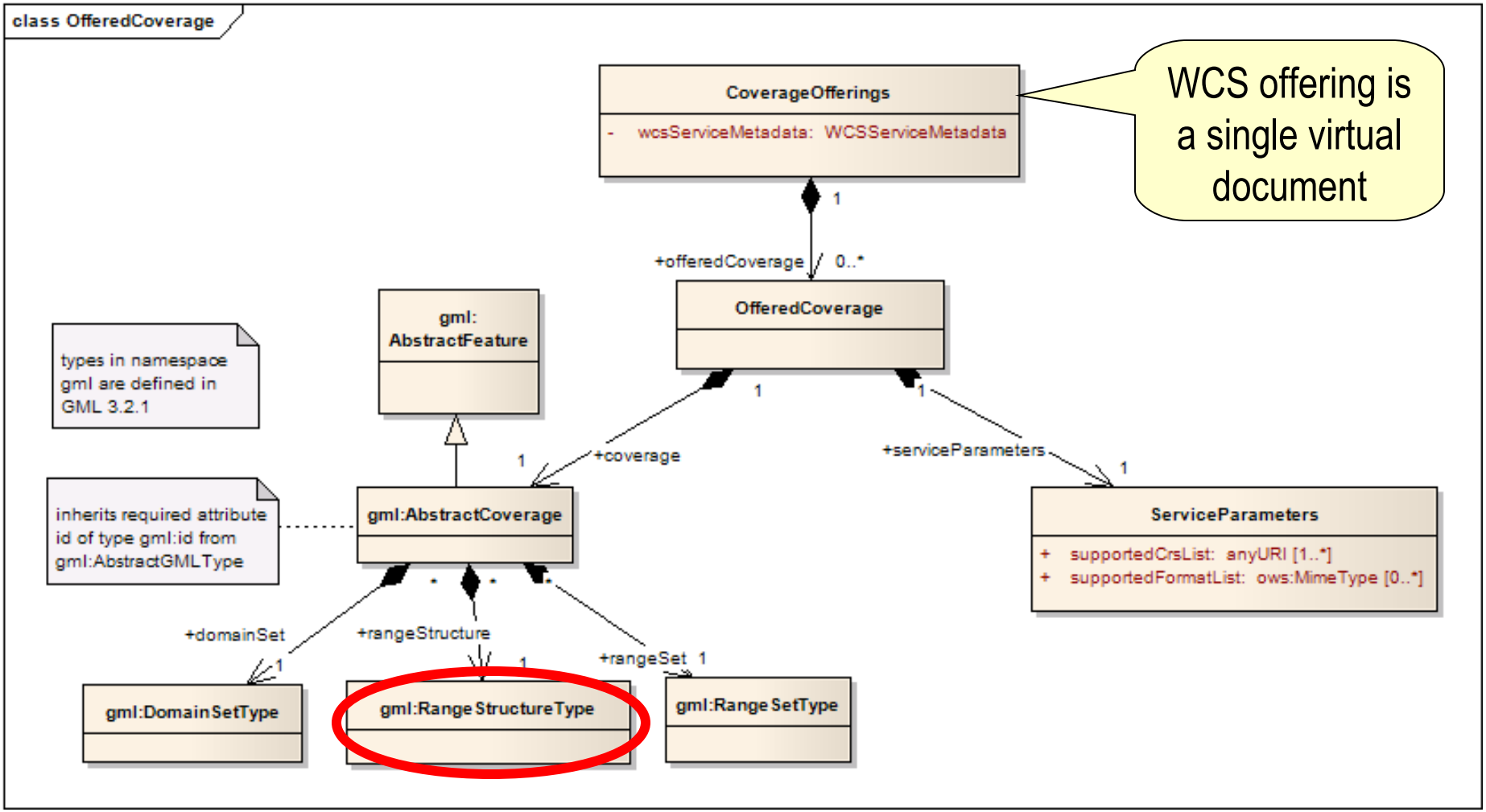
- Complete offering of a WCS server = 1 XML document
- Syntax: XML Schema, based on GML
- Semantics: XPath
  - **Req** Let `id1` and `id2` be GML identifiers of type `gml:id`. Then, the following **shall** hold:

```
id1 = id2
⇒
deep_equal(/CoverageOffering/coverage[@id = id1],
           /CoverageOffering/coverage[@id = id2] )
```

WCS 2.0 Draft

- Structure (w/o canonical clauses)
  - 6 WCS data model
  - 7 WCS service model
  - 8 WCS operations
  - 9 Encodings and protocols
  - 10 Exceptions
  - Annex A (normative) Abstract test suite
  - Annex B (informative) Core and extensions
- 30 pages overall, 19 pages net payload

WCS data model (Clause 6)



Where WCS Sees Adaptation Needs

See discussion on https://portal.opengeospatial.org/twiki/bin/view/WCS2x0swg/AnalysisOfGML

- Separate range *values* from range *description*
  - Currently all mixed in RangeSet
- Comprehensive range type description
  - RangeStructure to contain:
    - Structure of range type, if any (record, …?)
    - Range component data type (boolean, int, float, …)
    - Unit of measure (gml:UomIdentifier)
      - Possibly more, like datum for elevation; under discussion
    - nullValues (gml:ValueArray)
    - Interpolation: list of gml:CodeType, cf 19123
  - ows:[UnNamed]DomainType ?
  - Change Request under work; see also 08-157 by Andrew Woolf

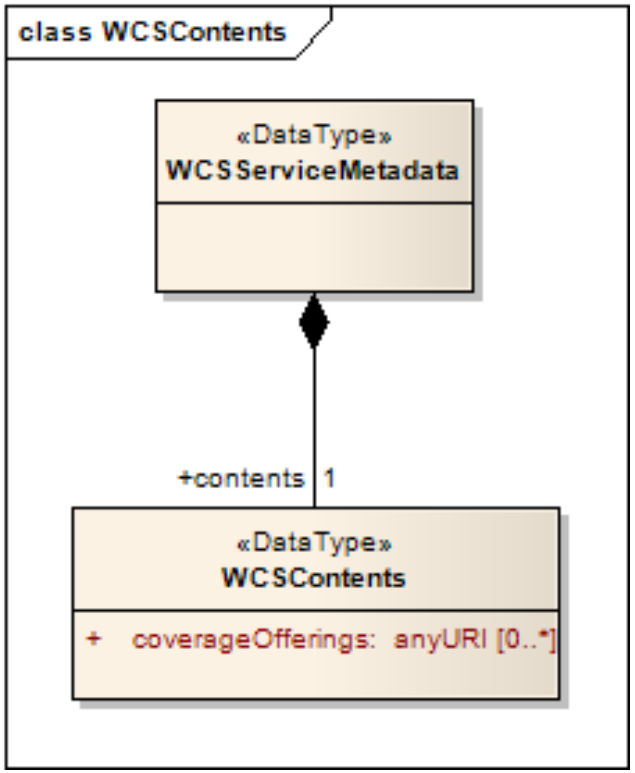
Where WCS Sees Adaptation Needs

- Separate range values from range description
  - Currently all mixed in RangeSet
- Comprehensive range type description
  - Change Request
- A WCS coverage shall have at least one CRS associated
  - ie, WCS.SWG feels that „our“ coverages cannot go without
  - From these, at least one for „direct“ (axis-parallel) access
  - We believe we can handle this through an additional WCS constraint
- Have a canonical place for CRS in a coverage object
  - CRS / domain association diverges from 19123
  - Location not straightforward

WCS service model (Clause 7)

- …as before
  - GetCapabilities
  - DescribeCoverage
  - GetCoverage

WCS operations (Clause 8)



- GetCapabilities:
  - Request: as before
  - Response:
    - Syntax: WCSContents
    - Semantics:

```
  /CoverageOfferings/@wcsServiceMetadata
| /CoverageOfferings/offeredCoverage/@id
```

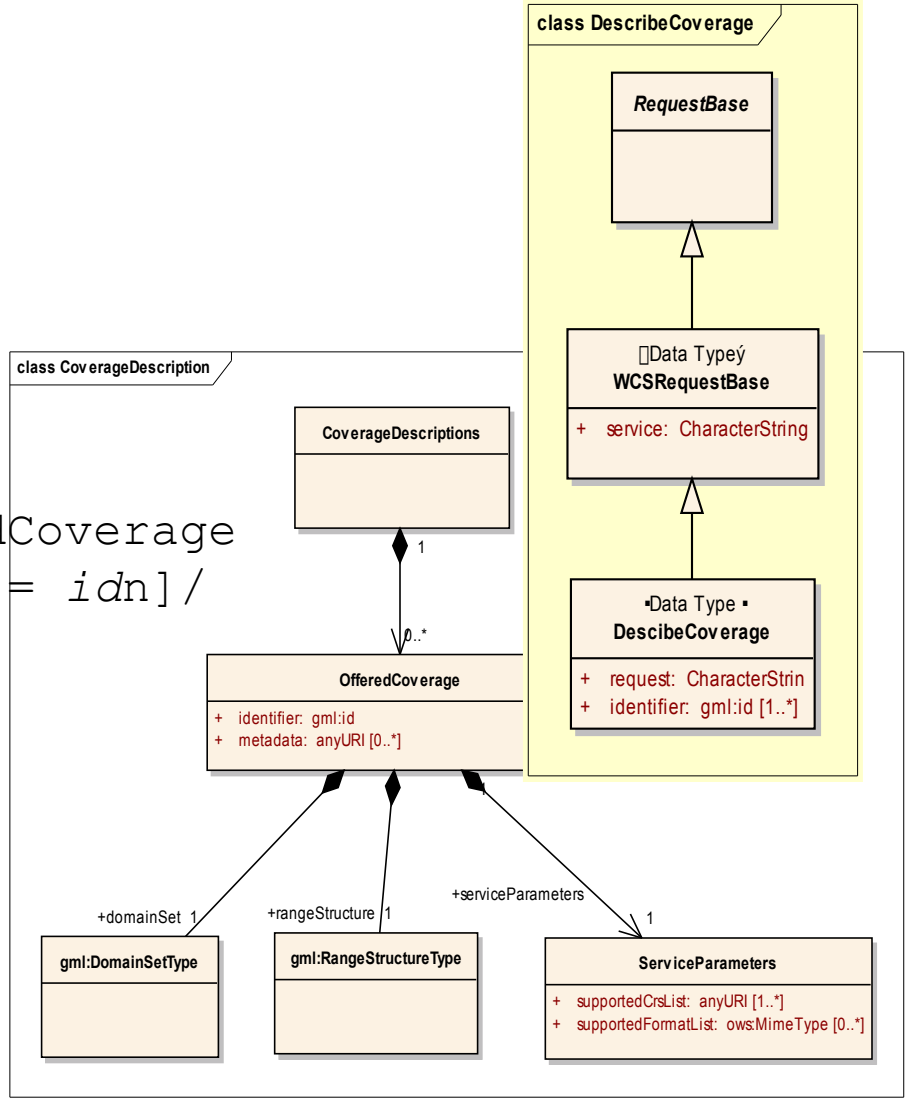
    - To be elaborated in detail

WCS operations (Clause 8)

- DescribeCoverage
  - Request:
    - Syntax: DescribeCoverage
  - Response:
    - Syntax: CoverageDescriptions
    - Semantics:

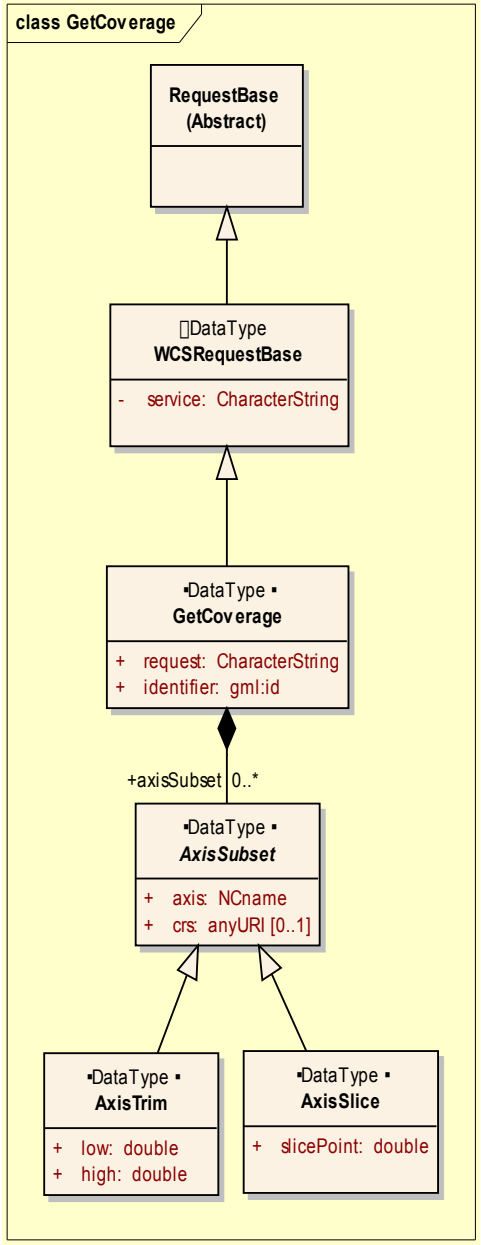
```
/CoverageOffering/offeredCoverage
   [@id = id1 or … or @id = idn]/
   ( domainSet
   | rangeStructure
   | wcsServiceParameters
   )
```

    - To be elaborated in detail



WCS operations (Clause 8)

- GetCoverage
  - Request:
    - Syntax: GetCoverage
    - Note differentiation:
      subset = trim | slice →know result dimension!
  - Response:
    - Syntax: gml:coverage
    - Semantics:
      `/CoverageOffering/offeredCoverage`
      `[@id = id]`
    - To be elaborated in detail



Encodings and protocols (Clause 9)

- Defines
  - GET / KVP
  - POST / XML
  - SOAP
- Requires any implementation to support at least 1 of those
- Anybody want to contribute REST? Still time…
- New: trim/slice operations in GetCoverage, ex:
  - ```
    http://www.myserver.org:port/path?
     service=WCS
    &version=2.0
    &request=GetCoverage
    &identifier=42
    &axissubset=x,urn:ogc:def:crs:OGC:2:84(-71,47)
    &axissubset=y,urn:ogc:def:crs:OGC:2:84(-66,51)
    ```
    ```

Goals achieved?

- design goals
  - Easy to handle
    - 32 pages overall
  - harmonization with GML coverage model
    - Ok once GML CR(s) accepted
  - Better suited for core/extension model
  - Formally stated testable requirements in the sense of the Policy doc
    - ok
  - best: formal specification
    - Ok, XPath

Next Steps

- Is our GML coverage UML diagram OK?
  - Need dictum of GML.SWG
- RangeStructure CR
  - CR best in close sync with GML.SWG
- CRS: how to handle, canonical place, ...
  - Requires WCS internal discussion
- Find minimal subset of GML required (KISS)
  - Need support of GML folks

Planned Schedule

- Gather input in today's meeting
- Refine & check WCS draft
  - Tools, test implementation
- Submit GML CR (~October)
- Write core (plus one extension?)
- Finalize WCS 2.0 for vote at December TC meeting