The WCS 2.0 Draft

70th OGC Technical Committee
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Peter Baumann
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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 → 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)

WCS offering is a single virtual document
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:
      ```xml
      /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