52north
exploring horizons

The WPS 2.0 Standard

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Overview

- Status update
- WPS 2.0 components
- Conformance tests

WPS 2.0 Status

- SWG vote two weeks ago
- OAB telecon today 9:30 p.m.
- Public comment period will start soon (hopefully)
- Still draft status

WPS 1.0

- Has gained some attention
  - Recently also in the environmental modeling domain
- Long due overhaul (dates back to 2007)
- Lot's of change requests accumulated
- Lacks support for process cataloguing
- No Abstract Test Suite (ATS)

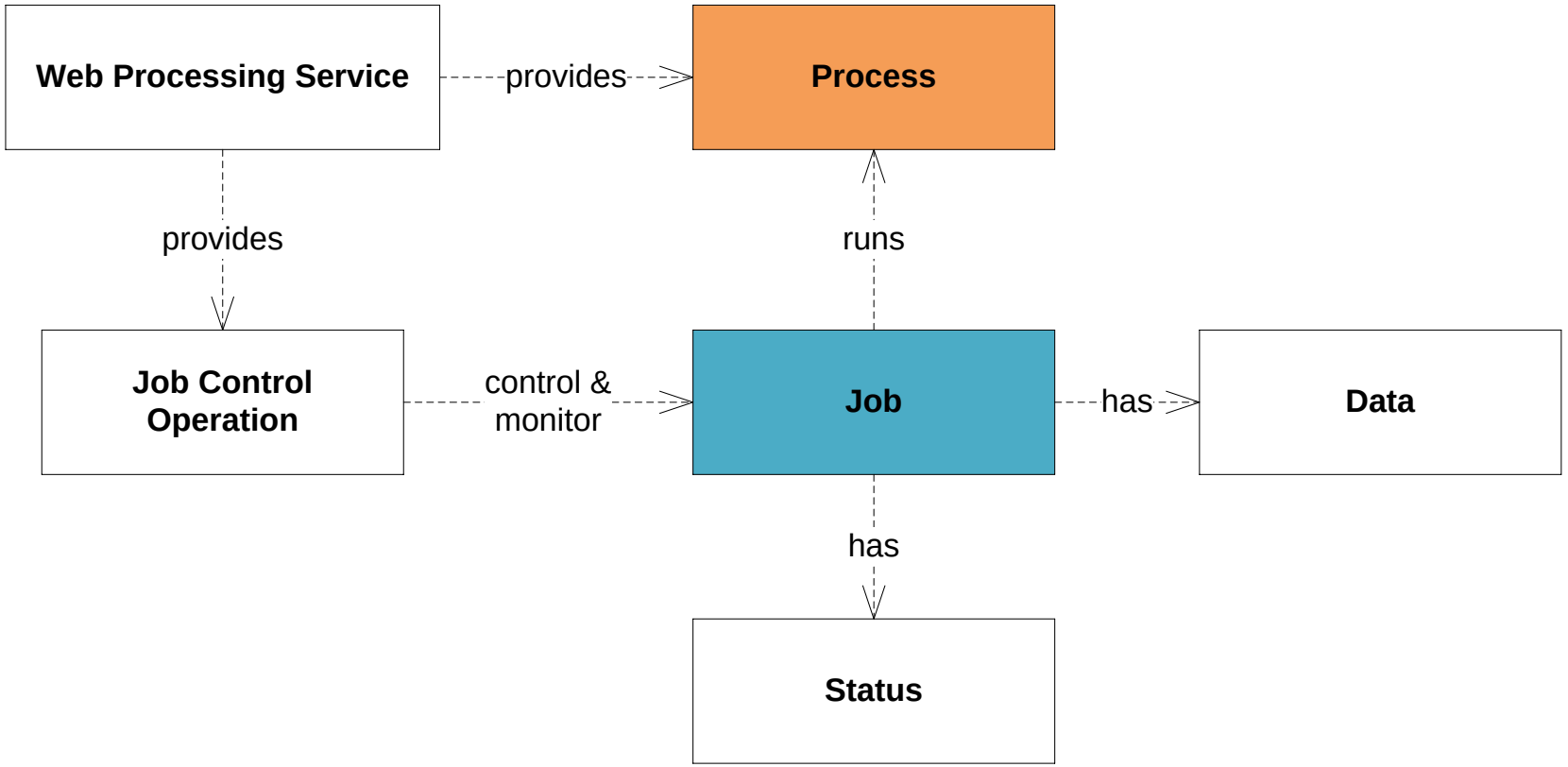
WPS 2.0 – Components

- Conceptual Model - Core
- (Native) Process model / data model
- Support for foreign process models
- Common Service operations
- Process profiles

WPS 2.0 – The core

- Is a conceptual model
- Formulates minimal platform-independent requirements for a WPS
- Can be realized in different Distributed Computing Platforms / Architectures (SOA, REST, …)

WPS 2.0 – The core



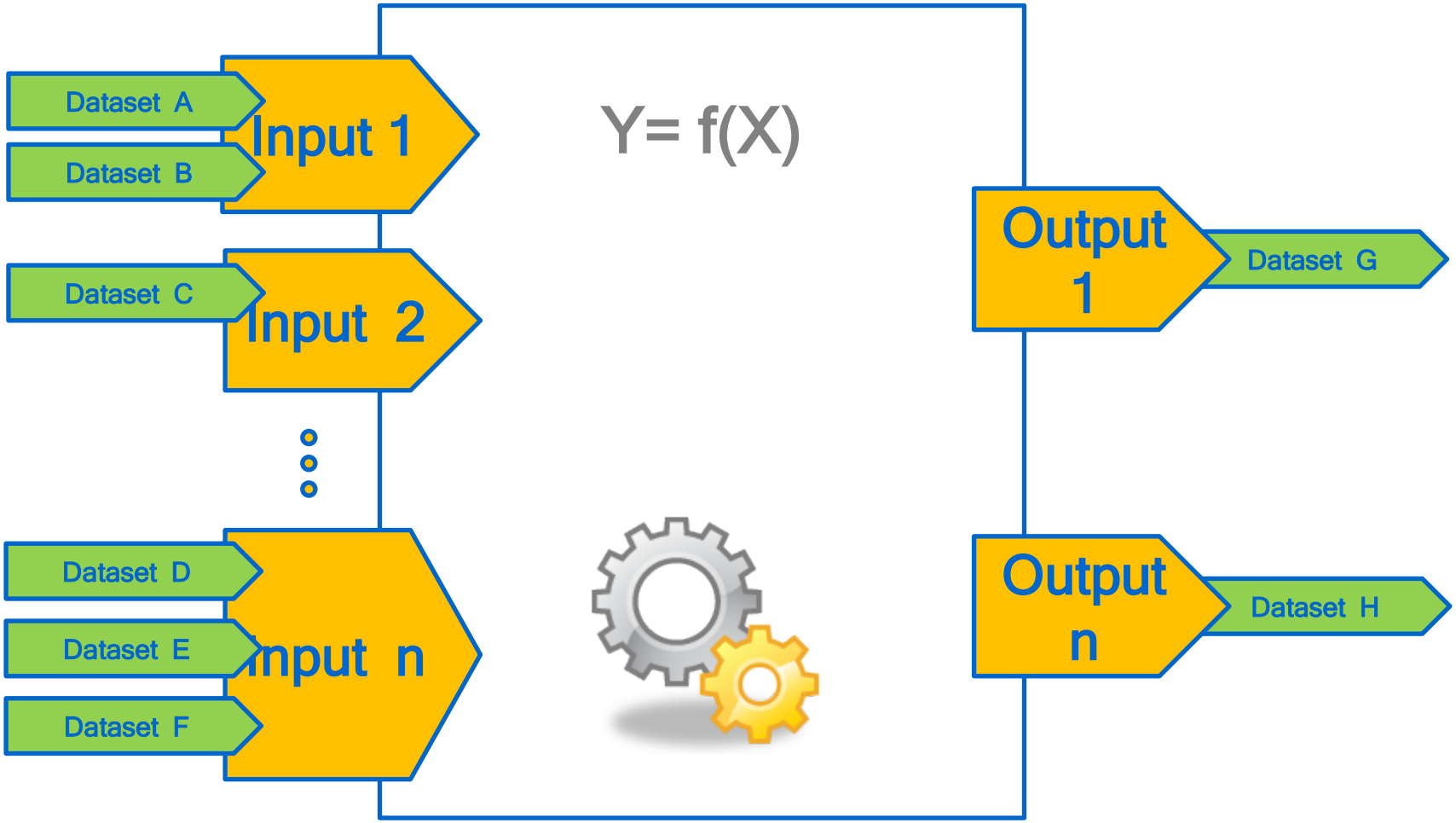
WPS 2.0 – The core

- Requirements around
  - Service discovery
  - Service capabilities
  - Abstract process model
  - Job control
  - Process execution
  - Data transmission by value / by reference
  - Job monitoring

WPS 2.0 – Process Model

- Process interface / signature
- Descriptive elements
- Data types

Process Model WPS 1.0



Process Model WPS 2.0

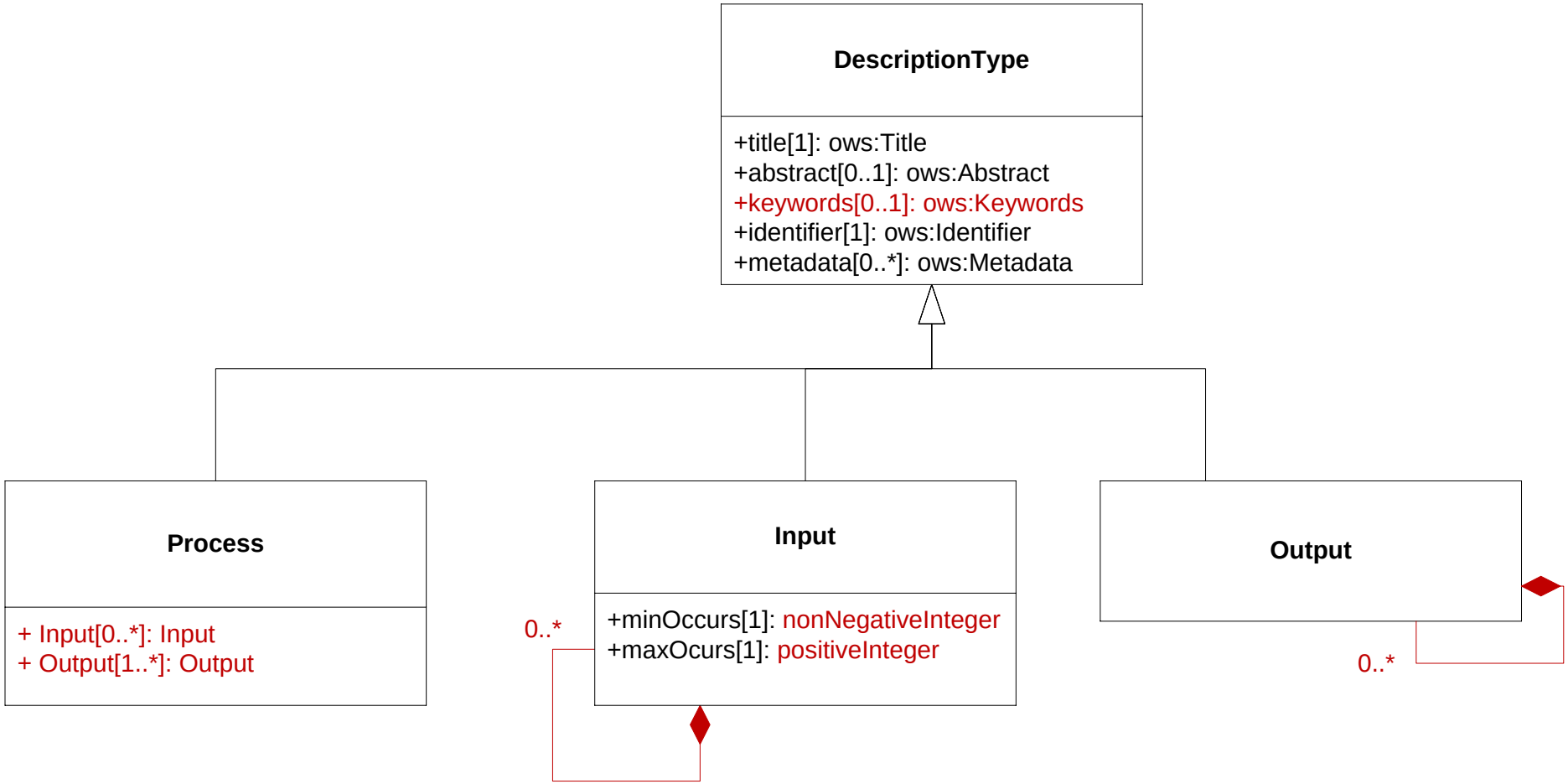
- Process (@Identifier, @Title, @Abstract, @keywords)
  - Input[0..*]
  - Input[0..*]
    - Input[0..*]
    - ...
  - ...
  - Output[1]
    - Output[1..*]
    - ...
  - Output[1]

WPS 2.0

- Nested in-/outputs
  - Specify one or more input types as „data type“ of an input
  - Established relations between inputs
  - Allows more structured inputs
  - Nesting level should be kept low

```
<DataInputs>
  <Input minOccurs="1" maxOccurs="50">
    <ows:Identifier>VALUE_WEIGHT_PAIRS</ows:Identifier>
    <ows:Title>...</ows:Title>
    <ows:Abstract>...</ows:Abstract>
    <Input minOccurs="1" maxOccurs="1">
      <ows:Identifier>VALUE</ows:Identifier>
      <ows:Title>...</ows:Title>
      <ows:Abstract>...</ows:Abstract>
      ...
```

Process Model WPS 2.0



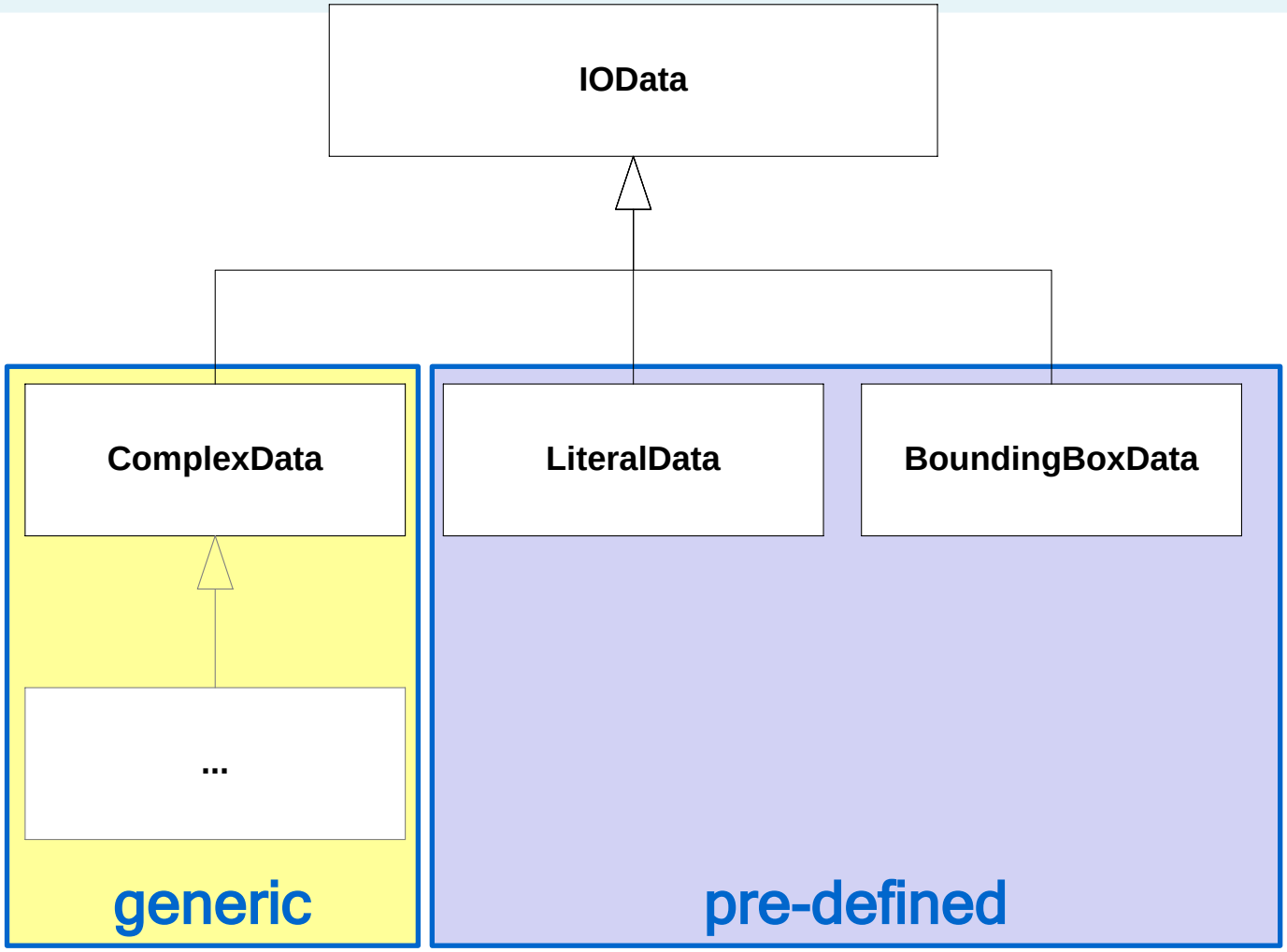
Process Model WPS 2.0

- More symmetry for inputs and outputs
- Documentation links in metadata elements

```
<ows:Metadata
xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation"
xlink:href="http://my.wps.server/processes/proximity/Planar-Buffer.html#input_geometry"/>
```

```
<ows:Metadata
xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation"
xlink:href="http://some.host/profileregistry/implementation/Planar-GML-Buffer.html"/>
```

Data model for Process I/O



Foreign process models

- Idea triggered by SensorML change request
- Purpose: WPS protocol shall support other process models that have their own descriptive model and data types
- Solution: Abstract minimum requirements for process models that shall be used in conjunction with WPS
  - Identifiers for processes, inputs, outputs
  - Well-defined data types
  - Cardinality constraints
  - ...

Common service operations

- GetCapabilities
- DescribeProcess
- Execute (mode=sync|async|auto)
- GetStatus (async)
- GetResult (async)
- Dismiss (extension)
  - Cancel / release running job
  - Release server-stored results

GetCapabilities

- More operations

```
<wps:Contents>
  <wps:ProcessSummary
        jobControlOptions="sync-execute async-execute dismiss">
    <ows:Title>Euclidean Distance</ows:Title>
    <ows:Identifier>
      http://my.site/distance-transform/euclidean-distance
    </ows:Identifier>
  </wps:ProcessSummary>
  <wps:ProcessSummary
                      jobControlOptions="async-execute dismiss">
    processVersion="1.4.0">
    <ows:Title>Cost Distance</ows:Title>
    <ows:Identifier>
      http://my.site/distance-transform/cost-distance
    </ows:Identifier>
  </wps:ProcessSummary>
</wps:Contents>
```

DescribeProcess

- More metadata

```
<wps:ProcessOffering
          jobControlOptions="sync-execute async-execute dismiss"
                        outputTransmission="value reference">

  <wps:Input>
    <ows:Title>Geometry to be buffered</ows:Title>
    <ows:Abstract>
      Simple Features geometry input in GML or GeoJson
    </ows:Abstract>
    <ows:Identifier>INPUT_GEOMETRY</ows:Identifier>
    <wps:ComplexData>
      <wps:Format mimeType="text/xml" encoding="UTF-8"
        schema="http://schemas.opengis.net/gml/
                        3.2.1/feature.xsd" default="true"/>
      <wps:Format mimeType="application/json"
                                          encoding="UTF-8"/>
    </wps:ComplexData>
  </wps:Input>
```

Synch/Asynch execute

- In WPS 1.0 asynch execute was steered by several flags
  - Impossible combinations could appear
- WPS 2.0:
  - One flag „mode“, synch, asynch or auto
  - Auto lets the server decide whether the job is run synch or asynch

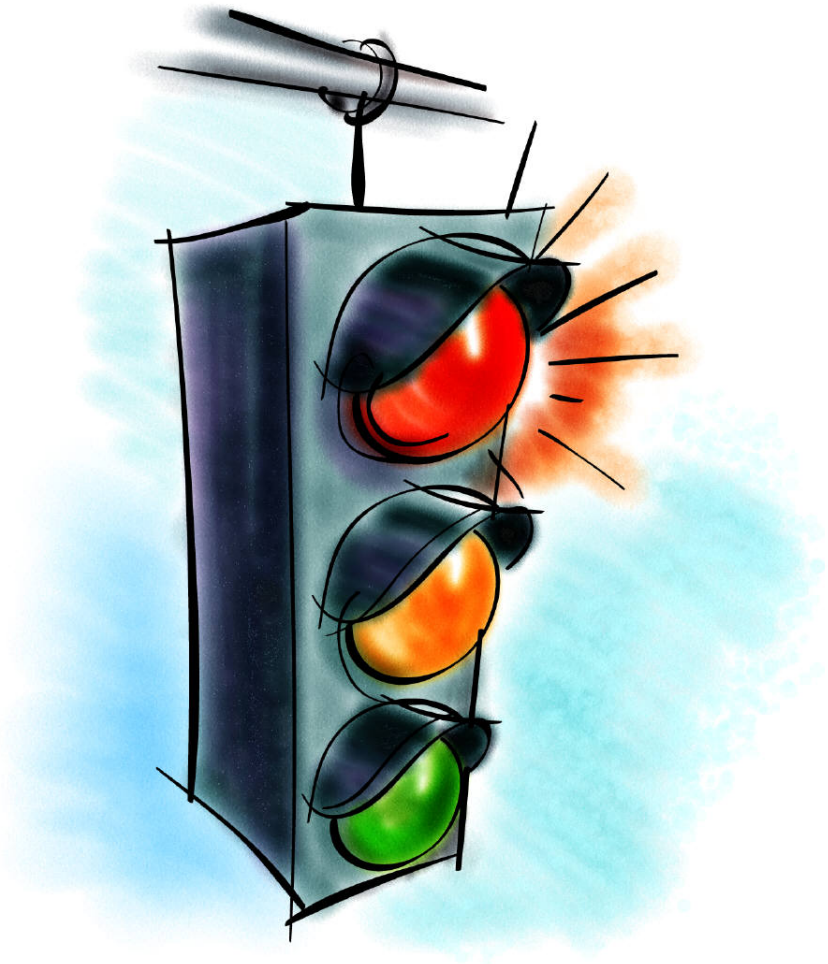
Execute

```
<wps:Execute
  service="WPS" version="2.0.0" response="document" mode="async">


 <wps:Input id=”INPUT_GEOMETRY”>
   <wps:Reference xlink:href="http://some.data.server/
                                                mygmldata.xml"/>

 <!-- Uses default output format -->
   <wps:Output id=”BUFFERED_GEOMETRY”
                                wps:dataTransmissionMode="reference">
   </wps:Output>
```

KVP for execute

- KVP for execute was removed
  - Too complicated because of double URL encoding and nested inputs
  - Could be re-introduced as extension

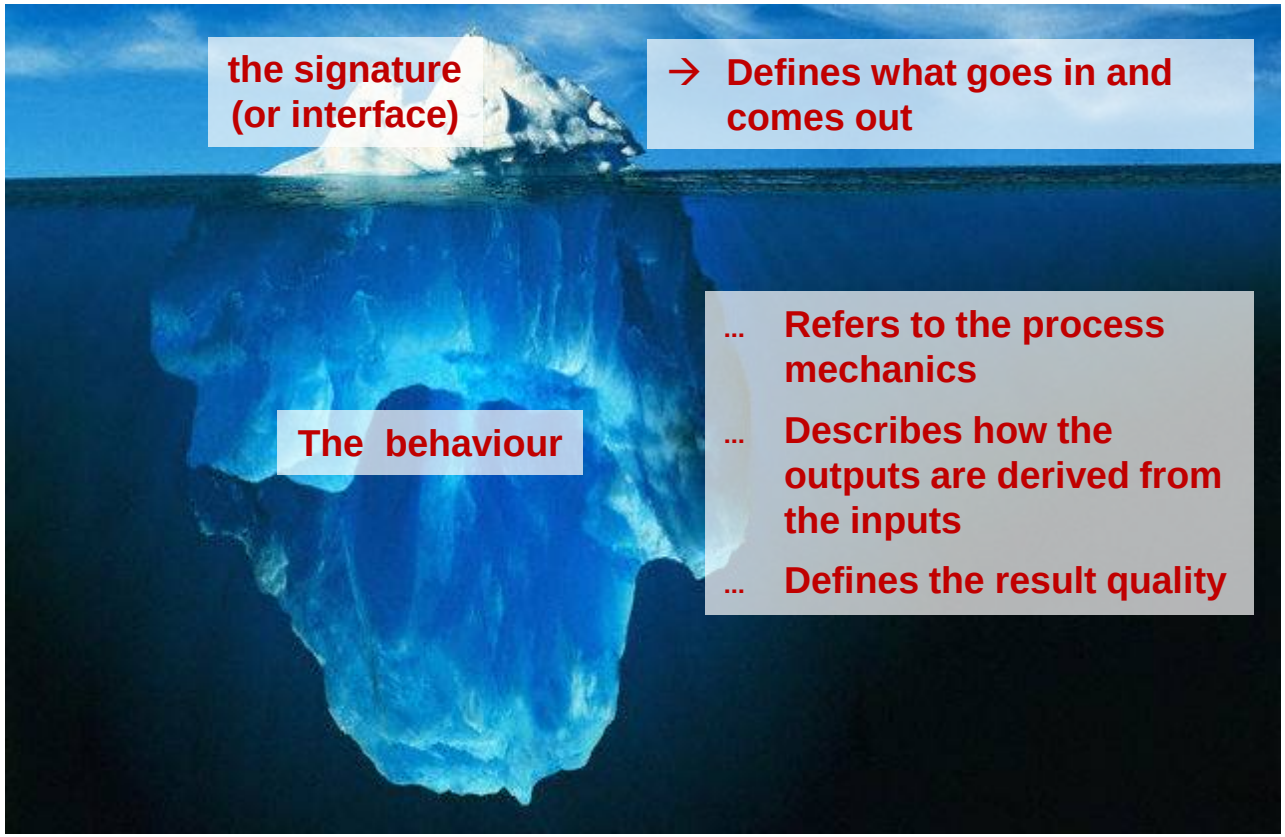
StatusInfo



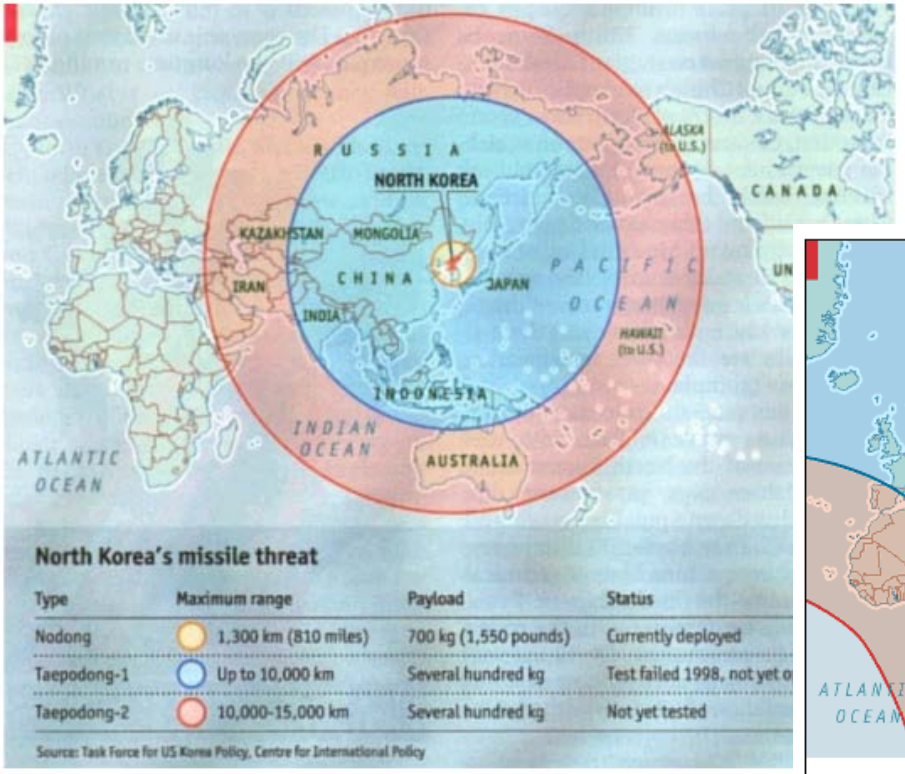
- JobID
- Status (Running, Succeeded,…)
- Estimated completion
- NextPoll
- Expiration date
- Percent completed

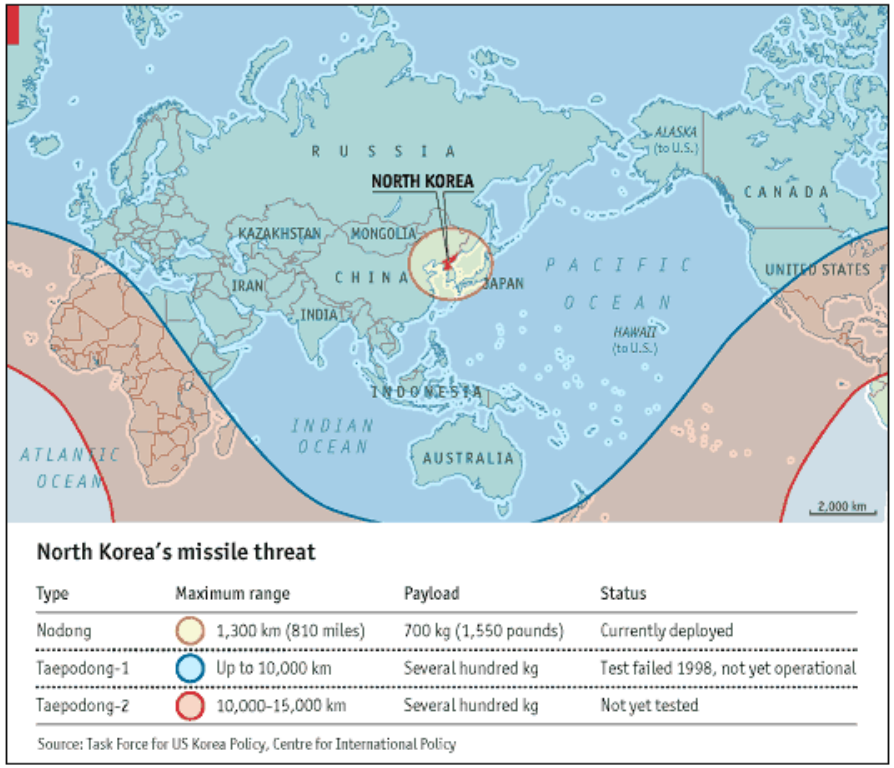
The scope for Process Profiles

- Align the interfaces of different implementations
- Align the behavior of different implementations

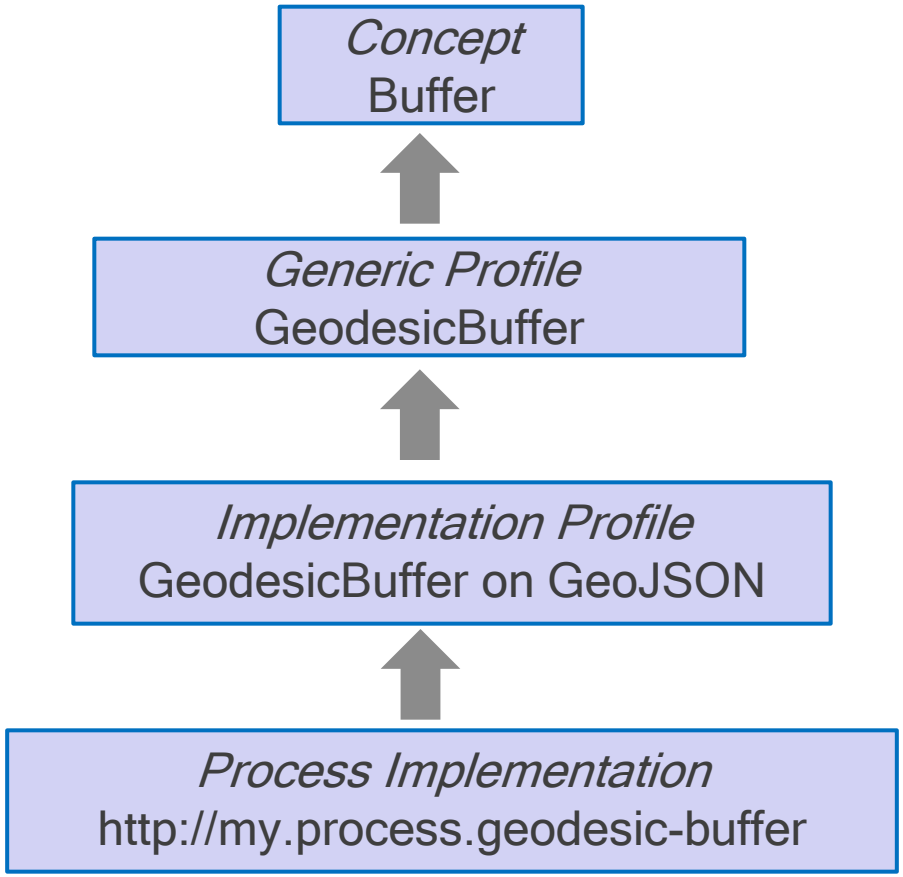


Fundamental difference: Planar vs geodesic buffering





Hierarchical profiling approach (Buffer)



Conformance tests

- More tests than in version 1.0
- Still no release of ATS for 1.0
  - Difficulties testing execute
- Work is needed to create ATS for 2.0
  - Together with test developers
  - Planned to do this in the context of OWS-11

Conformance tests

- Proposal to introduce an echo process
- Offers Complex-, Literal, BBoxData
- Returns inputs unchanged
- Execute operation should be testable

Summary

- WPS 2.0:
  - Modular standard
    - Conceptual service model
    - Process model
  - Leaner specification
  - More metadata
  - Fine grained profiles

More information:

WPS 2.0 SWG

OGC TC Discuss/Announce list

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