A repeatable approach to validate geospatial interoperability
December 2023

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Chief Standards Officer, OGC
Agenda

• The OGC Standards-Innovation continuum
• Collaborative Solutions and Innovation
• OGC Compliance Program
The OGC Standards-Innovation continuum
Call for Sponsors

Identify Project

Create public call

Select best members

Executive Project

Generate Results

Innovation Cycle

Use cases and requirements

DWG discussion

SWG formation

Standards development

Formulation of enhancements

DWG/SWG Presentation

Interest gathering

Solve discrete problems

OGC Innovation-Standardization continuum

Experiment in context
Collaborative Solutions and Innovation
What is OGC Innovation?

Design and experimental laboratory
Best practices engineering and consulting
Prototype development and demonstration
OGC COSI: Data to Wisdom

Technology Maturation Strategy
› Technology Readiness Levels (TRL) Scale
› Successful synchronized development of the required individual technologies

Knowledge Value Chain
› From raw data to high level products
› Data - Information - Knowledge - Wisdom
# Technology Maturation Strategy

## Technology Readiness Levels

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic Principles Observed</td>
<td>Translation of basic research to possible applications. Ideation, technology foresight.</td>
</tr>
<tr>
<td>2</td>
<td>Technology Concept Formulated</td>
<td>Early technological and applied product and process research. Preparation system integration.</td>
</tr>
<tr>
<td>3</td>
<td>First Assessment feasibility concept &amp; technologies</td>
<td>Prototype system integration. Service development.</td>
</tr>
<tr>
<td>4</td>
<td>Validated Integrated Prototype In Lab</td>
<td>Prototype testing in real environment, product/process enhancements.</td>
</tr>
<tr>
<td>5</td>
<td>Tested Prototype In User Environment</td>
<td>Deployment and performance tests.</td>
</tr>
<tr>
<td>6</td>
<td>Pre-Production Product</td>
<td>Scale in markets</td>
</tr>
<tr>
<td>7</td>
<td>Low Scale Pilot Production Demonstrated</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Manufacturing fully tested, validated, qualified</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Production &amp; Product Fully Operational</td>
<td></td>
</tr>
</tbody>
</table>

### Technology Readiness Levels:

- **Fundamental research/invention**
- **Concept validation**
- **Prototyping & incubation**
- **Pilot production & demonstration**
- **Initial market introduction**
- **Market expansion**
OGC Initiative Types and TRL

- Testbed
- Engineering Services
- Pilot Interoperability Experiment
- OpEx
- Design Ex Sprint
- Plugfest

Variety

<table>
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<tr>
<th>Basic Principles Observed</th>
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Fundamental research/invention  
Concept validation  
Prototyping & incubation  
Pilot production & demonstration  
Initial market introduction  
Market expansion
COSI - sponsors

- Reduce technology risk
- Stay on top of trends
- Show leadership
- Influence capabilities and tools
- Cost share with others
COSI - participants

- Develop at the cutting edge
- Understand sponsors’ needs & market
- Early at market
- Boost R&D budget
- Gain recognition
Collaborative Solution and Innovation Projects

1. Research
   - Testbed-18/19
   - CHEK, ACCORD
   - USAGE, DEMETER

2. Application
   - GeoE3, AD4GD,
   - CLINT, CLIMOS,
   - ILIAD, eShape

3. Communities
   - Marine Pilot
   - Disaster Pilot
   - Climate Pilot
Interoperability and Collaboration from Oceans to Space

Testbed-19

Finishing soon
Interoperable and Open Information Climate Resilience Pilot

Open Geospatial Consortium
Disaster Pilot

Eyes in the sky, feet on the ground.
Highlighting results from above initiatives
Open Science
Persistent
Demonstrator
Growing the Open Science Community
OGC Compliance Program
Introduction

• The OGC Compliance Program provides the resources, procedures, and policies to certify products for compliance with one or more OGC standards.

• The primary purpose of the program is to increase systems interoperability while reducing technology risks by providing a process whereby compliance with OGC standards can be tested.
Relation to ISO 19105 Conformance & Testing Standard

Specification Elements

- Requirements Classes
- Requirements
- Conformance Classes
- Conformance Tests

Image source: ISO 19105
OGC Compliance Testing & Certification Process

1. Implementation passes the test hosted on the OGC test facility
2. Organization applies for compliance certification on the OGC website
3. Compliance submission is reviewed by OGC staff
4. Implementation is certified and listed in the public OGC compliance database
5. Organization purchases license to use certification mark

Example

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NOTE: Compliance testing on the OGC Validator is free. However, there is a fee to use the **Certified OGC Compliant** mark.

Pricing is at [https://www.ogc.org/compliance](https://www.ogc.org/compliance)
Compliance Testing: How long does it take?

• Self test to confirm that the application can pass the test (approximately 5 to 10 minutes)

• Make an online request to OGC to certify as compliant (5 minutes)

• OGC will verify and then respond
Tools for testing and validation of compliance

• For regular testing (by most users)
  ❖ Use the hosted OGC Validator at https://cite.ogc.org/teamengine

• For testing during application development
  ❖ Use the docker images, command-line interface, or Java JAR libraries
OGC Validator
https://cite.ogc.org/teamengine

Product Improvement and Differentiation
The OGC validator is an essential tool that helps organizations better implement service interfaces, encodings and clients that adhere to OGC standards. Passing the test and getting OGC certified helps organizations distinguishing their product in the market place.

Community Tool
Developers, product and quality assurance managers have been using this free validator for over 8 years.

Features
The OGC Web Validator has the following features:
- Speed testing
- Detailed reporting
- Storing of sessions
- Validation of services
- Validation of clients
- Validation of schemas
- Validation of data

Get OGC Certified
The validator can be used by OGC and non OGC members as often as they like to test their implementations of OGC standards.
The source of the engine and the tests are available at GitHub. The CITE forum provides a place to ask questions and help developers pass the tests.

Available Test Suites

<table>
<thead>
<tr>
<th>Specification</th>
<th>Version</th>
<th>Test Suite Revision</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalogue Service - Web (CSW)</td>
<td>2.0.2</td>
<td>1.18</td>
<td>Final</td>
</tr>
<tr>
<td>Catalogue Service - Web (CSW)</td>
<td>3.0.0</td>
<td>1.3</td>
<td>Final</td>
</tr>
<tr>
<td>GML in JPEG 2000 (GMLJP2)</td>
<td>2.0</td>
<td>1.1</td>
<td>Final</td>
</tr>
<tr>
<td>GeoPackage</td>
<td>1.0</td>
<td>1.1</td>
<td>Final</td>
</tr>
<tr>
<td>GeoTiff</td>
<td>1.2</td>
<td>1.1</td>
<td>Final</td>
</tr>
<tr>
<td>Geography Markup Language (GML)</td>
<td>3.2.1</td>
<td>1.29</td>
<td>Final</td>
</tr>
</tbody>
</table>

To apply for certification, visit the OGC implementation database, register your product and provide details about the validation results.
Community and support

Open Source

GitHub

Maven

TestNG

Jenkins

Public Forum

Support

Code

Contributors

GML CRS, and polygons definitions

Enable testing of INPSIRE metadata profiles

Processing non-ASCII chars

Communities Collaboration
Thank you

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