



OGC Innovation Program Update

**3D Geospatial Summit II
Orlando, FL USA**

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Mark Reichardt

mreichardt@opengeospatial.org

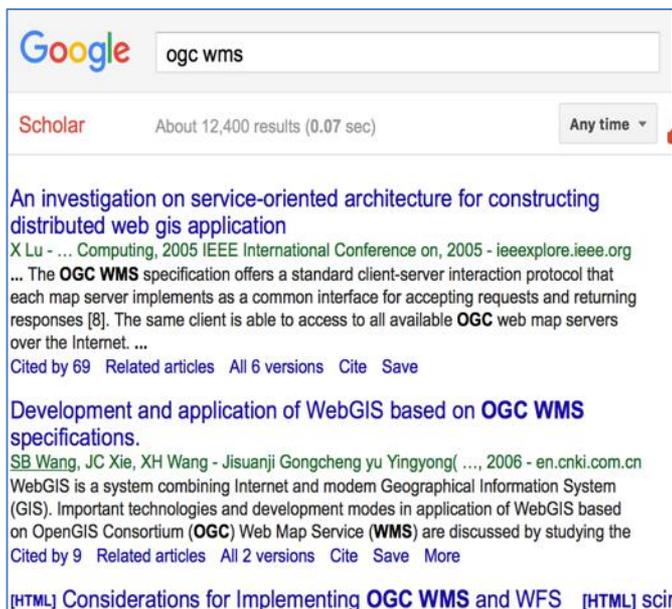
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Web Mapping Testbed in 1999

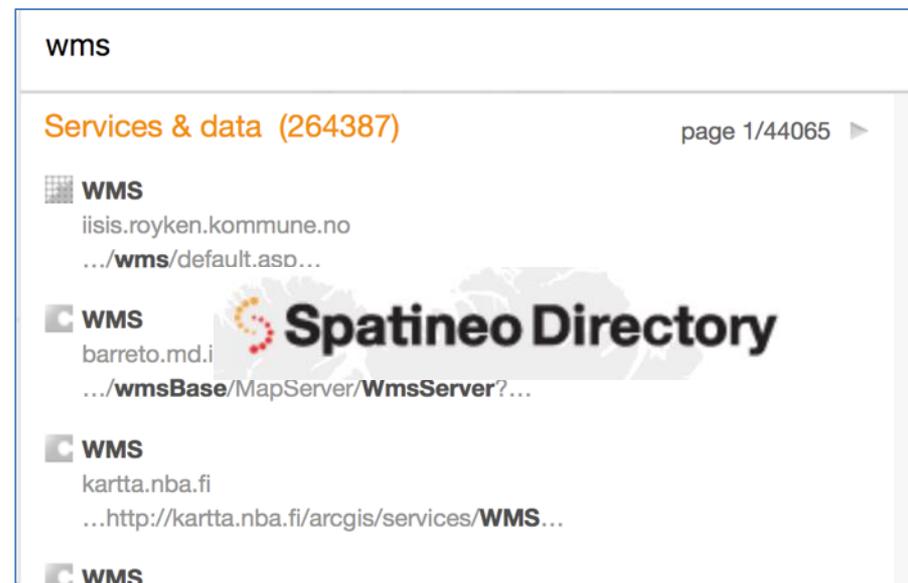
Created the Web Map Service (WMS)

Today we have **thousands of articles** related to WMS

Today **hundreds of thousands of layers** are available



Google Scholar search results for "ogc wms". The search bar shows "ogc wms" and the results count is "About 12,400 results (0.07 sec)". The first result is titled "An investigation on service-oriented architecture for constructing distributed web gis application" by X Lu, published in "Computing, 2005 IEEE International Conference on, 2005 - ieeexplore.ieee.org". The abstract states: "The OGC WMS specification offers a standard client-server interaction protocol that each map server implements as a common interface for accepting requests and returning responses [8]. The same client is able to access to all available OGC web map servers over the Internet. ...". Below the abstract are links for "Cited by 69", "Related articles", "All 6 versions", "Cite", and "Save". The second result is titled "Development and application of WebGIS based on OGC WMS specifications." by SB Wang, JC Xie, and XH Wang, published in "Jisuanji Gongcheng yu Yingyong(..., 2006 - en.cnki.com.cn)". The abstract states: "WebGIS is a system combining Internet and modern Geographical Information System (GIS). Important technologies and development modes in application of WebGIS based on OpenGIS Consortium (OGC) Web Map Service (WMS) are discussed by studying the". Below the abstract are links for "Cited by 9", "Related articles", "All 2 versions", "Cite", "Save", and "More". At the bottom of the screenshot, there are links for "[HTML] Considerations for Implementing OGC WMS and WFS" and "[HTML] scir".



Search results for "wms" on the Spatineo Directory. The page shows "Services & data (264387)" and "page 1/44065". The first result is titled "WMS" with the URL "iisis.royken.kommune.no .../wms/default.asp...". The second result is titled "WMS" with the URL "barreto.md.i .../wmsBase/MapServer/WmsServer?...". The third result is titled "WMS" with the URL "kartta.nba.fi ...http://kartta.nba.fi/arcgis/services/WMS...". The fourth result is titled "WMS" with a partially visible URL. The Spatineo Directory logo is visible in the background.

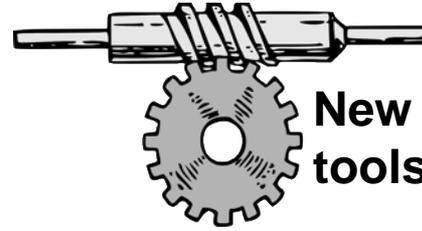
OGC Innovation Program Initiatives

- ***Reduce technology risk*** through accelerating development, testing and acceptance of interoperability standards with the refinement of standards and best practices
- ***Expand the market and improve choice*** by encouraging industry adoption of new standards and best practices, ensuring market availability of interoperable solutions
- ***Mobilize new technologies*** through providing participants with real world experience and a platform to innovate while driving early adoption of standards
- ***Provide cost effective method*** for sponsors and participants to share expertise and development while gaining early marketplace insight and advantage

Benefits to Sponsors



**Confidence
and
advancement
of solutions**



**New
tools**

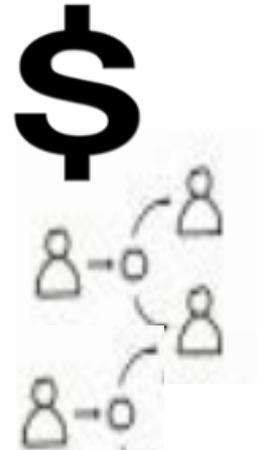
**Influence
technology**



**Lead new
standards**



**Get early
insights
from
experts**



**Leverage
investment (cost
sharing/ pool of
sponsors)**

Benefits to participants



**Position themselves
in the global
marketplace**



**Improve
their
solution**



**Interact with
sponsors and
technical experts**



**Increase
Business**



**Get
funded**

Press Release:



Participant X
did Y work



**Opportunity to
market company
and solutions**

Initiative phases



**Identify pool
of sponsors**



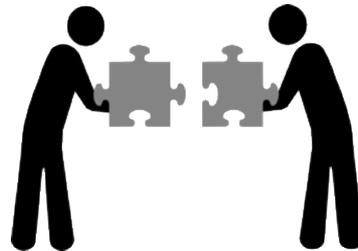
**Concept
development**



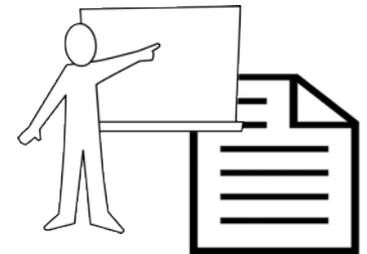
**Call for
Participation**



**Team
formation**

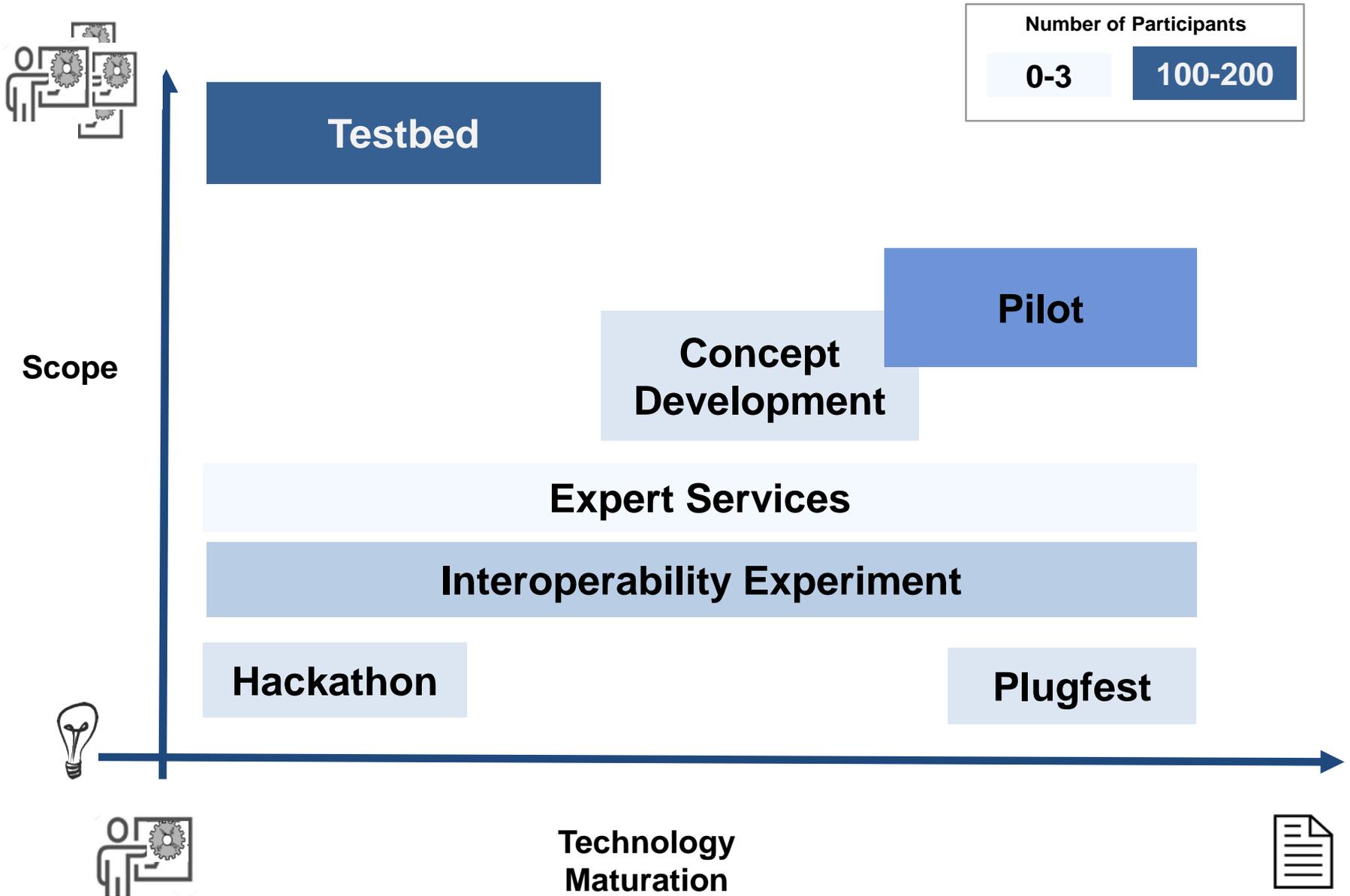


Execution



**Demonstration
and outreach**

Types of Initiatives – Agile Prototyping



Example Recent / Planned Pilots

- **Aviation Pilot** produced proven standards that are now operational in civilian aeronautical information management systems
- **Empire Challenge Pilot** enabled sharing of sensor data in the defense and intelligence domain based on the OGC Sensor Web Enablement standards.
- **Arctic Data Pilot** demonstrating the diversity, richness and value of a Spatial Data Infrastructure (SDI) to Arctic stakeholders.
- **Future Cities Pilot** demonstrated how use of CityGML and IFC (BIM standard) together to enhance financial, environmental, and social outcomes for citizens living in cities.
- **Underground Infrastructure Pilot** – based on results of recent NYC Concept Development Study, this pilot will demonstrate a common architecture and data model across multiple cities. Scenarios will include street excavations, large scale construction, disaster planning and response.

Relevant Activities in Current / Upcoming OGC Initiatives

- [OGC Testbed 13](#) (Completion December 2017)
 - Explores
 - expansion of CDB 1.0 feature codes and application schema via NAS profile
 - use of OGC Web Services framework to access the CDB data store.
 - Engineering Report expected to be released in late December 2017
- [OGC Testbed 14](#) (Request out 8 December 2017, Kick Off April 2018)
 - Indoor Navigation
 - Includes focus on first responder indoor navigation
 - Create and convert 3D indoor LiDAR point cloud models to functional building and navigation models for high risk structures
 - Store and serve point cloud, building, and navigation models for visualization and navigation
 - Derive dynamic turn-by-turn indoor navigation instructions based on the navigation model
 - View and annotate point cloud and building models, along with navigation routes and instructions into, through, and out of buildings.

Current / Upcoming Initiatives

- OGC Testbed 14 (cont'd)
 - 3D Portrayal / Visualization / Streaming
 - Urban centric built infrastructure scenario
 - Test and validate the use of I3S and 3DTiles streaming protocols with the OGC 3D Portrayal Service
 - Focus on web based visualizations of CityGML and CDB data sets via structured workflows
 - Integration of Augmented Reality into CityGML
 - Visualization of AR content within CityGML models and 3D visualization
 - Machine Learning
 - Addressing uncertainties
 - Integration with OGC Web Services environment
 - From “supervised” to “reinforced” learning
 - Knowledge generation and semi-automated clustering techniques

References:

Testbed 14 Summary: <http://www.opengeospatial.org/projects/initiatives/testbed14>

Testbed 14 Ideas: <https://github.com/opengeospatial/testbed14-ideas/issues>

OGC Technology Trends: <https://github.com/opengeospatial/OGC-Technology-Trends>

Testbed 14

Topics Pending Sponsor Funding

- Sponsor areas of interest that are currently unfunded
 - CDB and 3D Globe Service
 - defined 'container', terrain service, model service, 3D feature service, disconnected capability
 - Semantic Web
 - Evaluation of semantic web approaches to optimize discovery and application of services and geoinformation via OGC services
 - Point Cloud and Cataloging
 - Common standards-based architecture to improve interoperability and application
- A second RFQ/CFP may be issued early February 2018 to address additional requirements

What Next?

- Explore adding priority M&S requirements to existing initiatives
- Explore joint initiatives led by members of OGC, SISO, and USGIF and the M&S community:
 - **Interoperability Experiments** - narrow focus, entirely member driven with light staff facilitation.
 - **Joint testbed threads / pilot initiatives** – more complex issues/requirements. Funding from sponsoring organizations, staff facilitated / managed.
 - Direct linkage with existing testing, prototyping activities:
 - Labs / testbed infrastructure led by Services
 - Research centers
 - Private sector
 - Exercises, LVC events - Operation Blended Warrior