



IEEE 1451 and OGC Collaboration in OWS-5 SWE

Presentation to SSHWG - 26 June 2007

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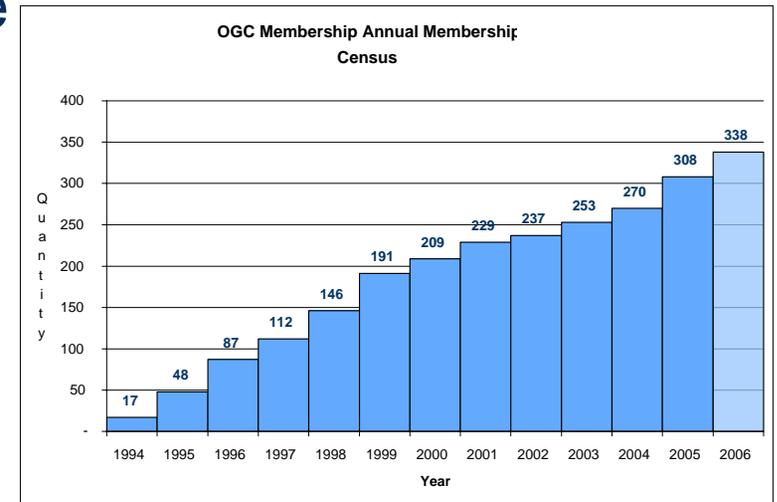


- OGC Interoperability Program
- OWS-5 Testbed
- IEEE1451 in OWS-5

OGC - Quick Background



- 340 members from 35 countries & 6 continents
 - 149 North America
 - 144 Europe
 - 39+ Asia-Pacific (emphasizing growth in this region)
 - 2 Africa
 - 1 South America
- Nineteen approved, publicly available Implementation Specifications
- 20+ draft Implementation Specifications in work
- Strong implementation of OGC standards in the market
- OGC standards used across the defense and intel. community



OGC

OGC Alliance Partnerships

Improve Standards Coordination / Harmonization



- World Wide Web Consortium (W3C)
- Internet Engineering Task Force (IETF)
- Digital Geospatial Information Working Group (DGIWG)
- Global Spatial Data Infrastructure Association (GSDI)
- International Organization for Standards (ISO)
- OASIS
- Object Management Group (OMG)
- Open Mobile Alliance (OMA)
- Web3D
- Simulation Interoperability Standards Organization (SISO)
- International Alliance for Interoperability (IAI)
- IEEE GRSS
- IEEE Technical Committee 9 (Sensor Web)
- National Institute of Building Sciences (NIBS)
- Taxonomic Data Working Group (TDWG)
- Others



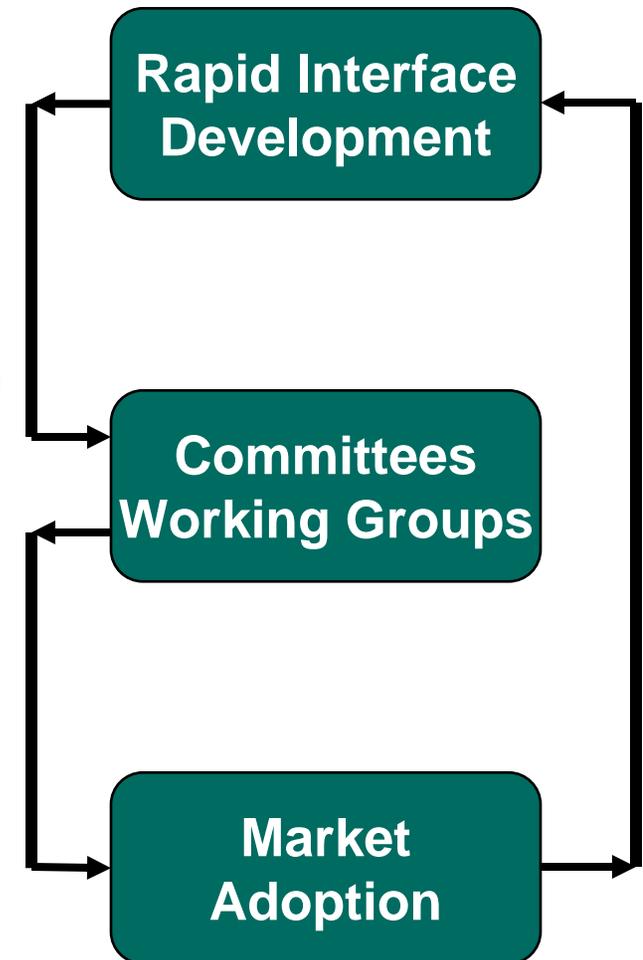
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- Others



OGC's Approach for Advancing Interoperability



- **Interoperability Program (IP)**
 - Global, hands-on prototyping and testing program designed to accelerate interface development and validation, and bring interoperability to the market
- **Specification Development Program**
 - Consensus processes similar to other Industry consortia (World Wide Web Consortium, OMA, OMG, etc.).
- **Outreach & Community Awareness Program** – education and training, encourage take up of OGC specifications, business development, communications



Why Participate in OGC Programs?

Benefits of OGC Standards and Programs



- Introduce requirements for industry action – The OGC consensus process gives user organizations a forum to work legally and directly with industry to encourage cooperative development and alignment of new open standards.
- Improved choice in the marketplace – OGC standards are designed to enable a choice of products that can plug-and-play seamlessly in system or enterprise environments. No single application meets the needs of all users,
- Reduced technology life cycle costs – Through the use of standards based COTS products, users have a better chance to reduce the cost of custom solutions and associated maintenance.
- Rapid Insertion of New Technology – By working with industry and academia to implement OpenGIS® specifications in their offerings, organizations can maximize their ability to rapidly transfer new solutions into use.



[INTRODUCTION](#)

[ABOUT OWS - 4](#)

DEMONSTRATIONS:

[Dirty Bomb Response](#)

[CAD-GIS-BIM](#)

[Earth Observation](#)

[GML CLIENT APPLICATION](#)

[HELP](#)

[EXIT DEMO](#)

OGC OWS-4 DEMONSTRATION



[START DEMO NOW](#)
OR
USE LEFT NAVIGATION
TO ACCESS ANY SECTION.

OGC Web Services-Phase 5 (OWS-5) Testbed



- Objective: Collaboratively extend and demonstrate OGC baseline for interoperable, multi-source decision support
 - Sensor Web Enablement (SWE)
 - Geo-Processing Workflow (GPW)
 - Agile Geography
 - Compliance Testing
- Execution phase: July 2007 to March 2008
- 8 Sponsoring organizations
 - Sponsorship total \$1.1M
 - Total In-kind: \$M to be determined

OWS-5 Schedule



-
- ✓ RFQ Issued May 11, 2007
 - ✓ Questions Due & Bidders Conference May 22, 2007
 - ✓ Clarifications Posted June 1, 2007
 - ✓ RFQ Responses Due June 8, 2007
 - Kickoff Meeting - Phase 1 July 30 - August 3, 2007
 - Interim Milestone Event September 21-22, 2007
 - Phase 1 Delivery, Phase 2 Kickoff
 - Demonstration March 2008 TC
 - Final Delivery March 2008 TC

Basic Sensor Web Requirements



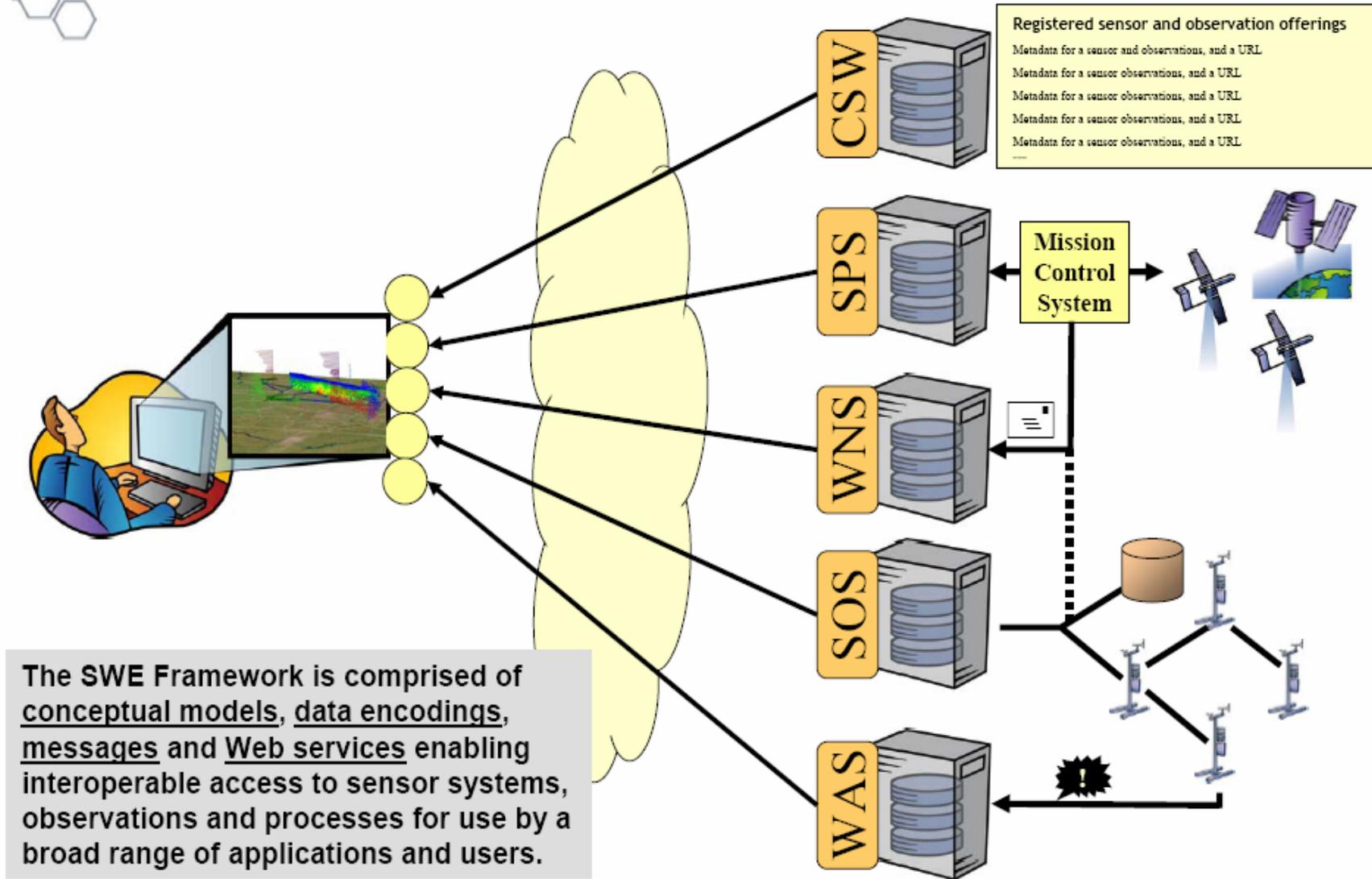
- Quickly **discover sensors and sensor data** (secure or public) that can meet my needs – location, observables, quality, ability to task
- **Obtain sensor information** in a standard encoding that is understandable by me and my software
- Readily **access sensor observations** in a common manner, and in a form specific to my needs
- **Task sensors**, when possible, to meet my specific needs
- Subscribe to and **receive alerts** when a sensor measures a particular phenomenon

OGC Sensor Web Enablement (SWE) Specifications



- Information Models and Schema
 - **Observations and Measurements (O&M)** – Models and schema for semantic basis of measurements
 - **Sensor Model Language (SensorML)** - Models and schema for components, georegistration, response, process models
 - **Transducer Markup Language** - Data encoding that enables interoperability and fusion of dissimilar sensor data
- Web Services
 - **Sensor Observation Service** - Access observations for a sensor or sensor constellation
 - **Sensor Planning Service** – Task sensor system for desired observations
 - **Sensor Alert Service** – Subscribe to alerts from sensor observations
 - **Sensor Registries** – Discover sensors and sensor observations
- Built upon OGC, Web and Internet standards

Enabling Sensor Webs with SWE Framework



The SWE Framework is comprised of conceptual models, data encodings, messages and Web services enabling interoperable access to sensor systems, observations and processes for use by a broad range of applications and users.



Team1451 Proposal to OWS-5

Team1451 Proposal to OWS-5



- Team-1451: individuals from the following organizations:
 - National Institute for Standards and Technology (NIST)
 - Oak Ridge National Labs (ORNL)
 - Smart Sensor Systems
 - Esensors, Inc.
 - ArgonST
 - University Alabama Huntsville
- Seeking other Participants

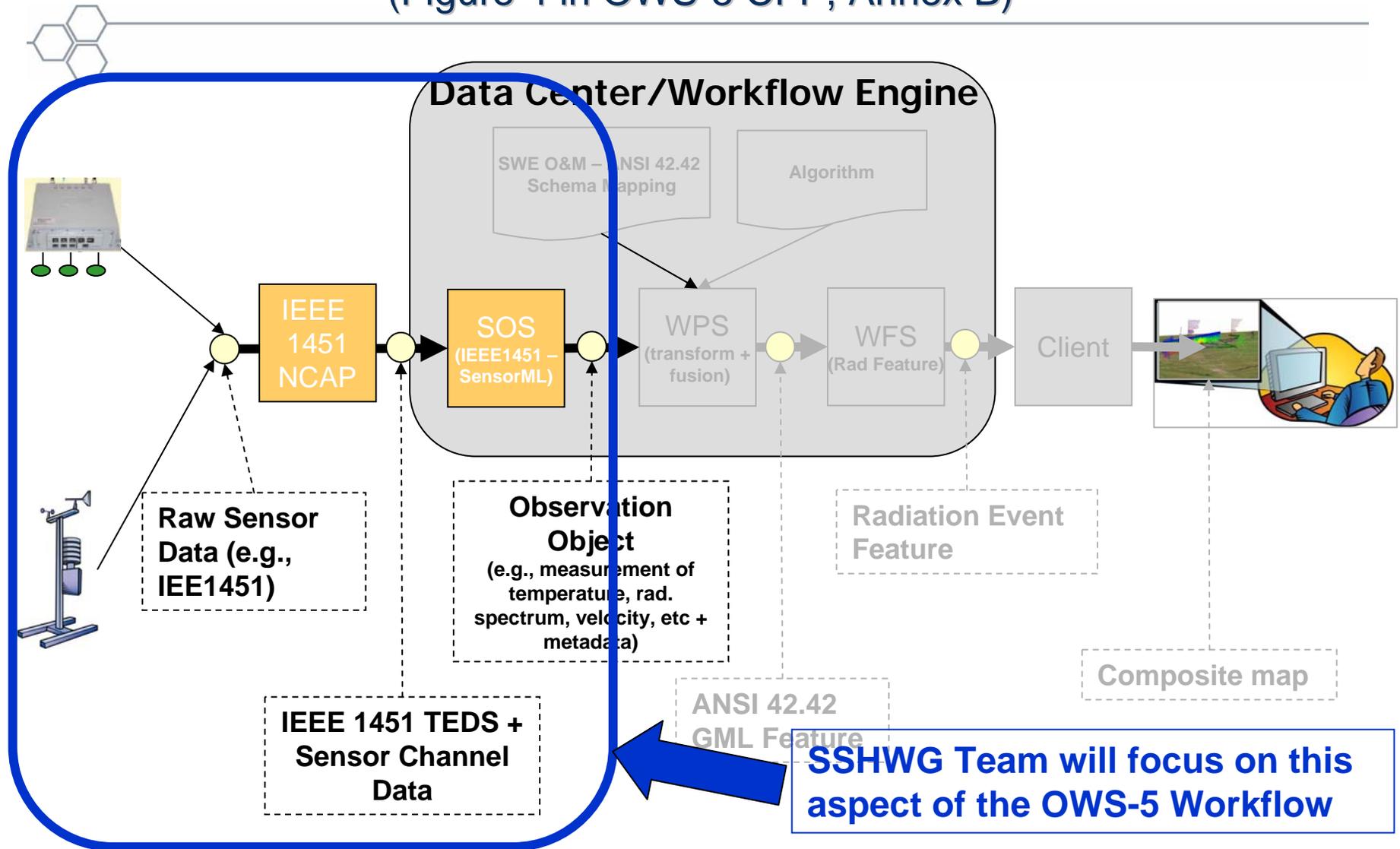
Team1451 Proposal to OWS-5



- SOA-based approach to interoperable implementation and integration of IEEE-1451 and OGC-SWE specifications
- Our goal is to demonstrate these scenarios:
 - Add new sensor module (sensor module plug & play), including sensor discovery and calibration
 - Access sensor data
 - Command sensor
 - Filter sensor data stream
 - Handle sensor alert
- Will enhance and support aspects of “down stream” data processing and workflow requirements OWS-5

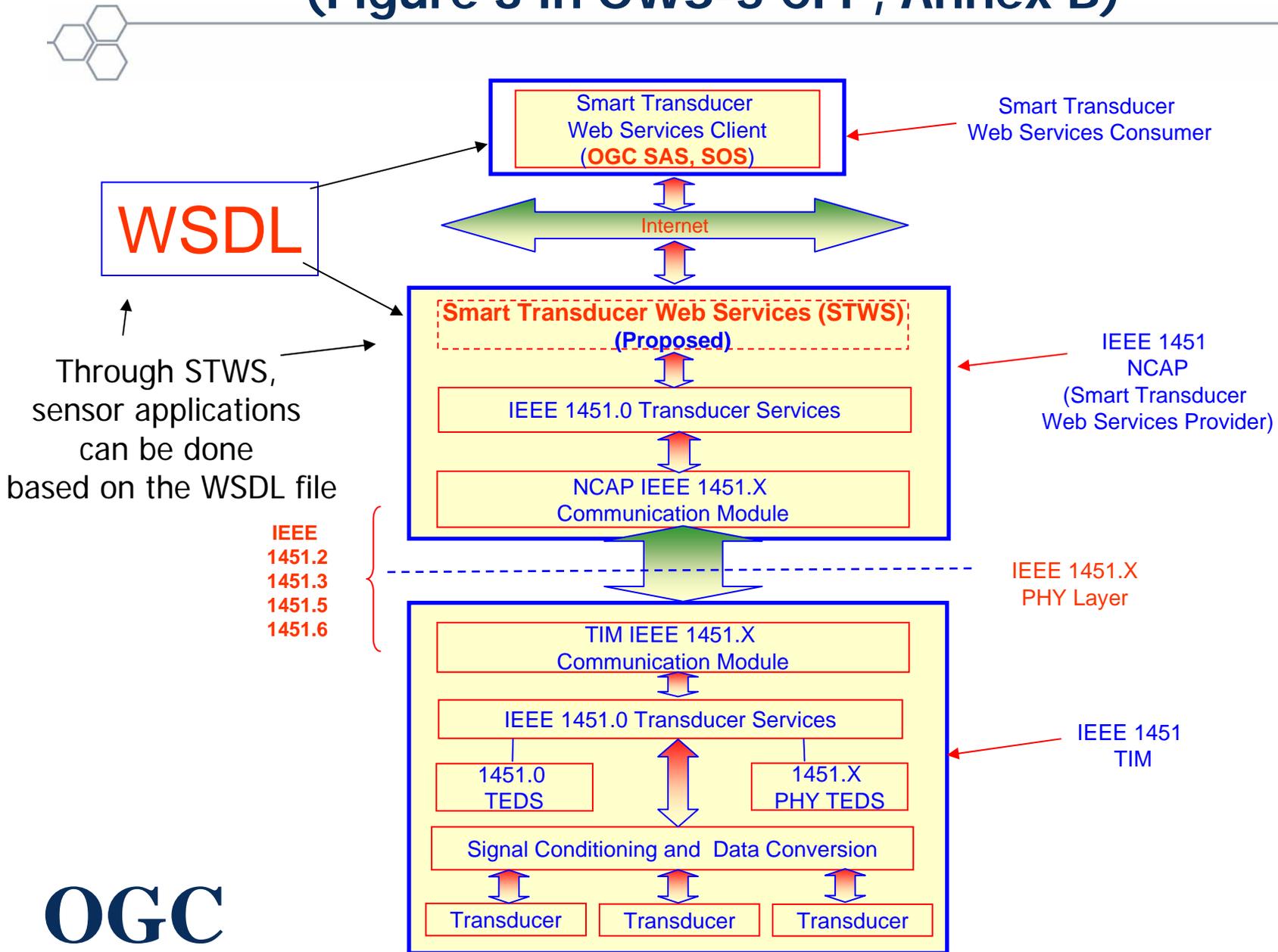
A SOA Workflow for Sensor Data

(Figure 4 in OWS-5 CFP, Annex B)



OGC-SWE & IEEE-1451 Interoperability

(Figure 3 in OWS-5 CFP, Annex B)



Summary



- Team1451 will progress SOA-based approach to Sensors through interoperable implementation and integration of IEEE-1451 and OGC-SWE specifications
- Team1451 seeks additional participation
- OWS-5 Schedule
 - Proposals to participate in OWS-5 needed before Kickoff
 - Kickoff meeting of OWS-5, week of 30 July



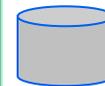
Backup

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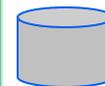
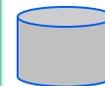
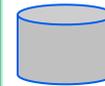
What Drives OGC Standards Development?



COI issues and business cases drive OGC standards development

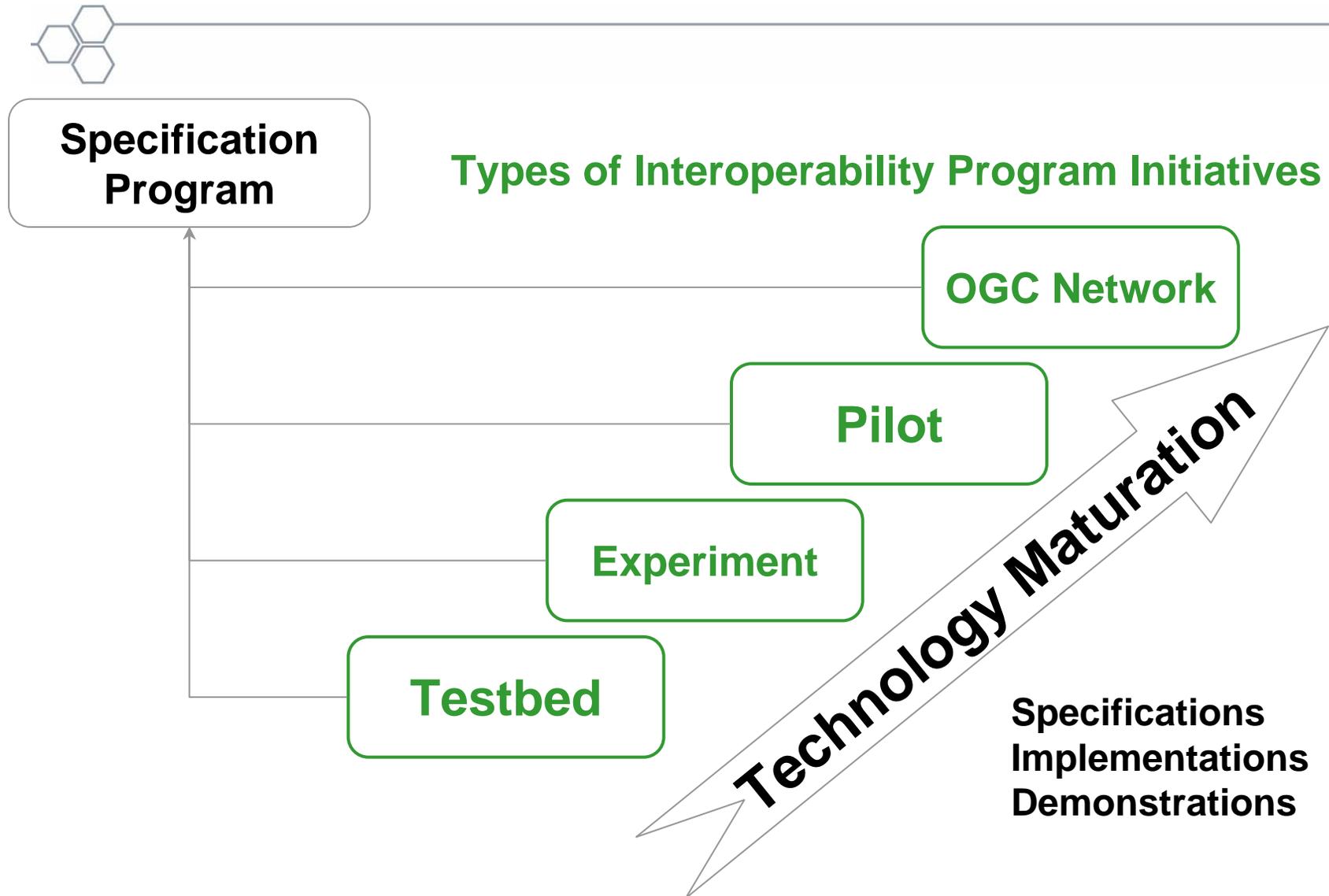


Strong focus on solving Homeland Security, Defense and Intelligence, EM/ER



Rapid prototyping emphasized to accelerate standards development and deployment

Interoperability Program Development



OGC Interoperability Program Initiative Efficiency



- Participants in OGC initiatives contribute more in in-kind contributions (labor, software, etc.) than is provided in Sponsor funding.
- For every one Euro or Dollar in sponsorship funding, the following initiatives have yielded:
 - Web Mapping Testbed I 4 times
 - Web Mapping Testbed II 3 times
 - Geospatial Fusion Services Testbed 3 times
 - OGC Web Services 1 2.7 times
 - Military Pilot Project 1 2 times
 - Open location Services 1.5 times
 - OGC Web Services 3 Testbed 3 times
 - OGC Web Services 4 Testbed 3.5 times
- Why? Vendors want early influence in specification development, early skill building, visibility, and opportunity for early market deployment of standards.

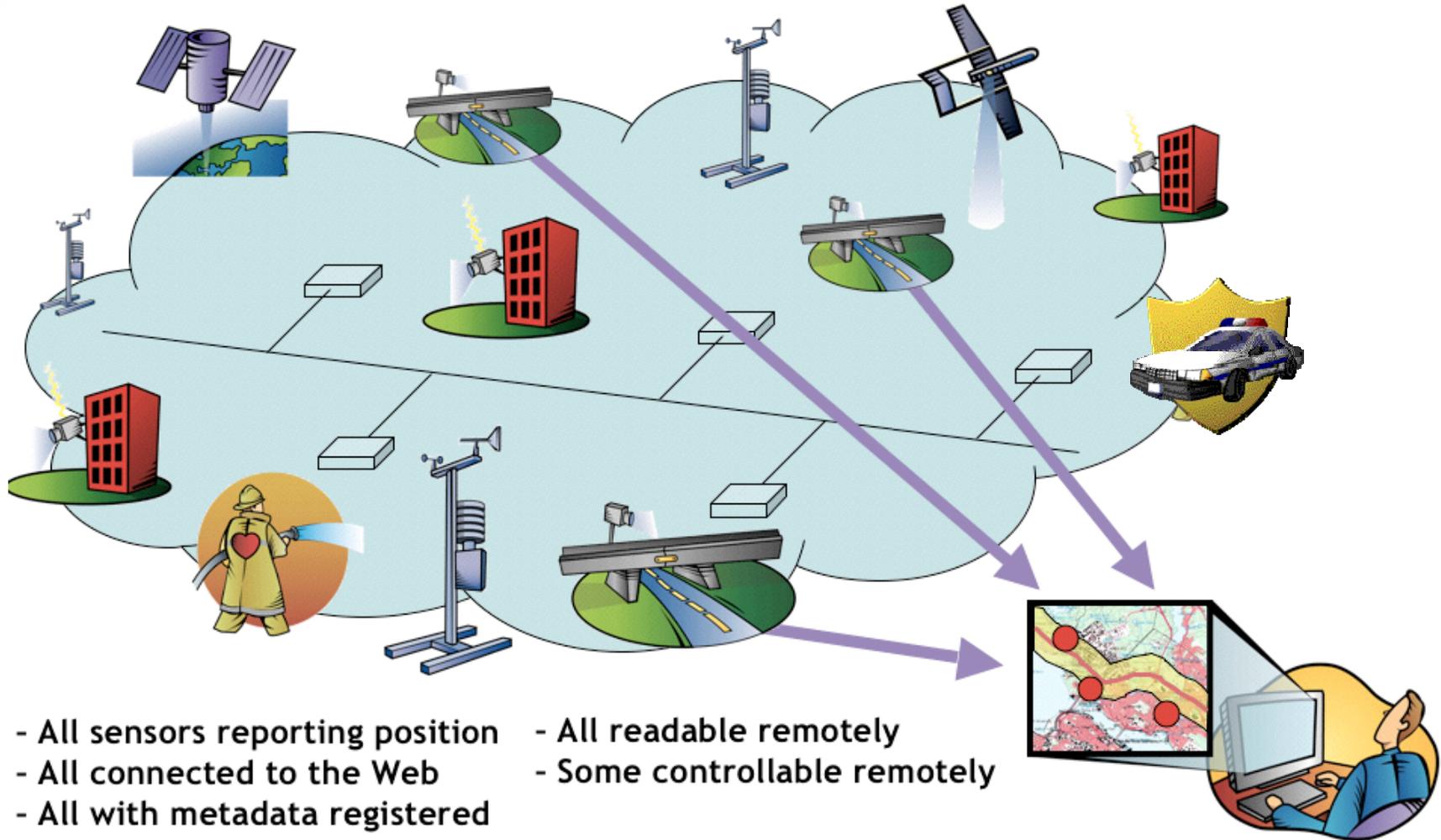
Why OGC?



- Proven process to mobilize industry broadly to cooperatively identify, develop and implement open standards to meet D&I and HLS needs
- Relevant Standards:
 - OGC Core Standards – support access and fusion of a variety of geospatial information to establish Situational Awareness
 - Sensor Web Enablement (SWE) standards approved to publish/discover sensors and sensor data; support access, fusion and application of sensed information in a location context
 - OGC Web Processing Service provides open standards container for critical processing / algorithms needed between the sensor and user
- Formal partnership with IEEE TC9 (1451) to assure that OGC and IEEE frameworks interoperate

OGC

The Sensor Web Concept



OWS-5 SWE Deliverables



- SOS - Georeferenceable Image
- Image Geopositioning Service
- WCS-T - Georeferenceable Image subsetting, JPIP
- SPS for airborne and spaceborne sensors
- Mass Market/EO SWE Implementations
- SOS for IEEE-1451 – Team1451
- SWE Profile for TPPU