



# Open Geospatial Standards for Preparedness and Crisis Management

ANSI/HSSP 9<sup>th</sup> Annual Plenary Meeting

Panel 5: Preparedness and Crisis Management Standardization

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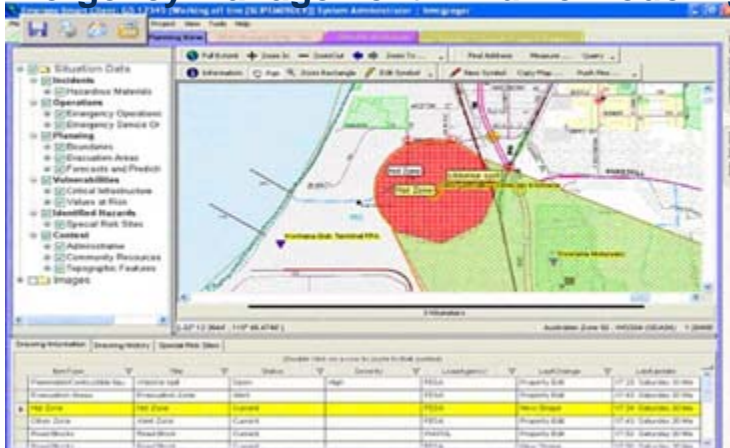
# Location Is Key



## OGC Vision

To achieve the full societal, economic and scientific benefits of integrating location resources into commercial and institutional processes worldwide

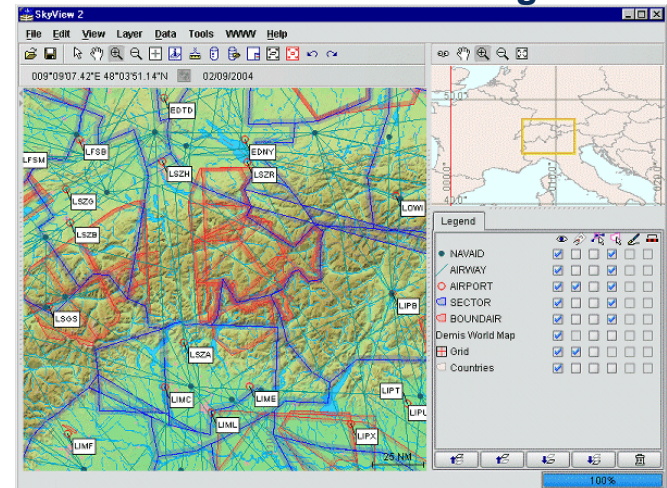
### Emergency Management – Plume Modeling



Landgate, Shared Land Information Platform, Western Australia

OGC Web Services Standards making data from 20+ agencies available to thousands of users.

### Aeronautical Information – Flight Safety



Skyview2, Eurocontrol

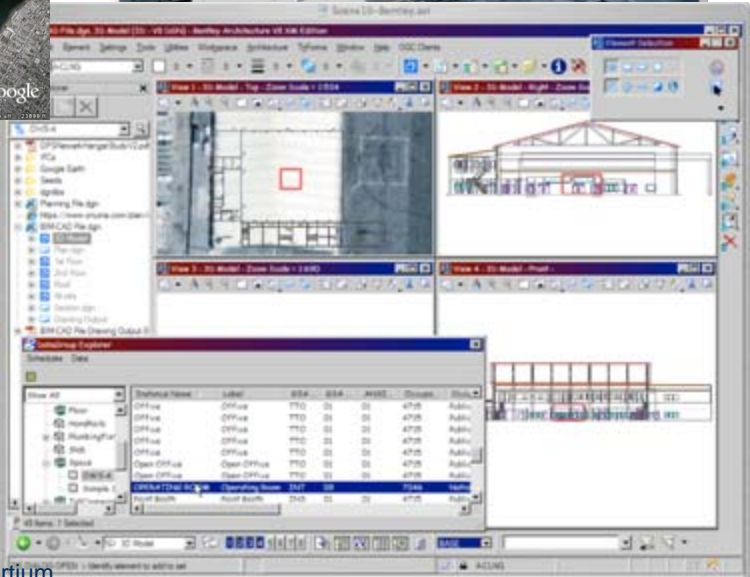
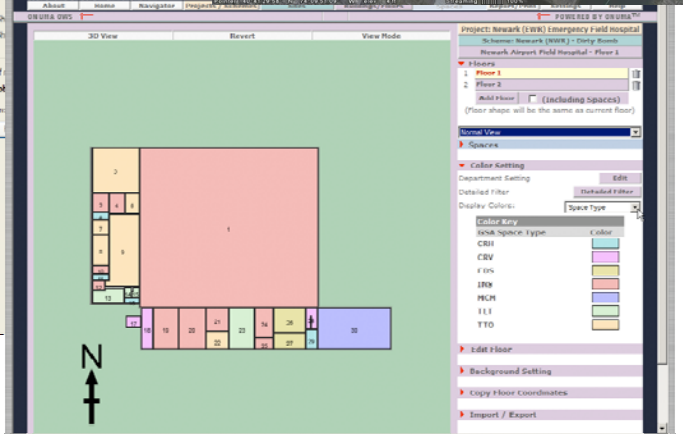
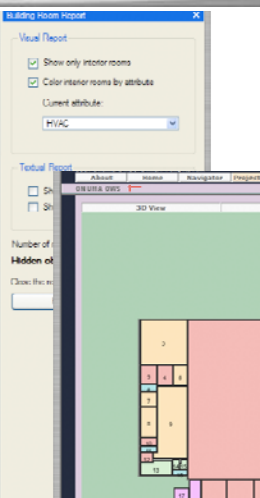
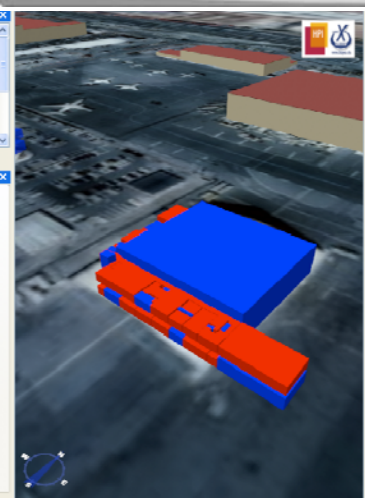
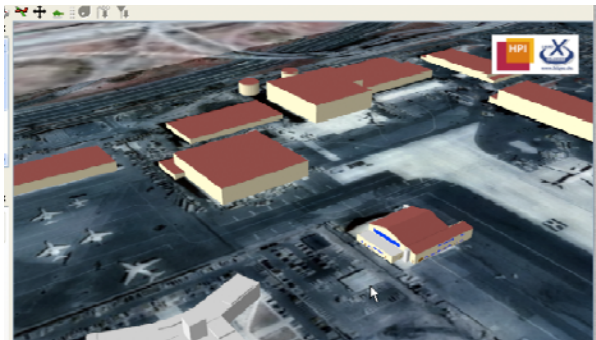
OGC Web Services Standards, Aeronautical Information XML based on OGC Geography Markup Language



# Heavy Emphasis on Emergency Management, HLS, D&I Requirements in OGC Standards Development

(OGC Web Services Phase 4 Testbed - 2006)  
Dirty bomb scenario in Port of NY/NJ

<http://www.opengeospatial.org/pub/www/ows4/index.html>

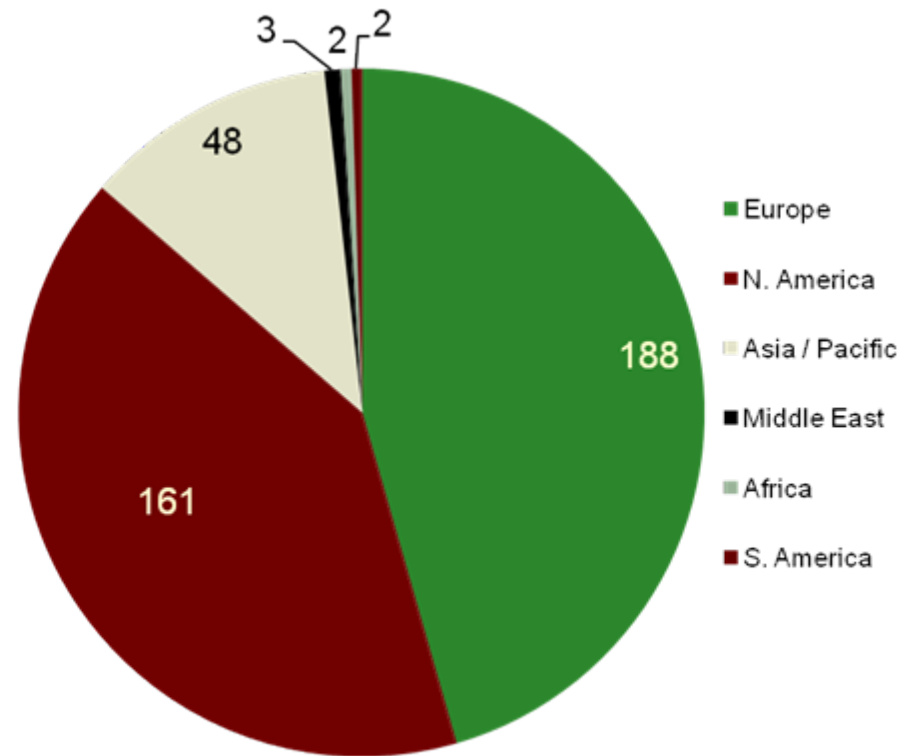


# OGC - Summary



- Voluntary consensus standards organization founded in 1994
- 404 member organizations and growing
- 30+ implementation standards available free of charge
- Emphasis on rapid prototyping based on user scenarios
- Hundreds of product implementations in the global market
- Broad user community implementation worldwide
- Alliances with many other SDO's

OGC Membership Distribution  
By Region



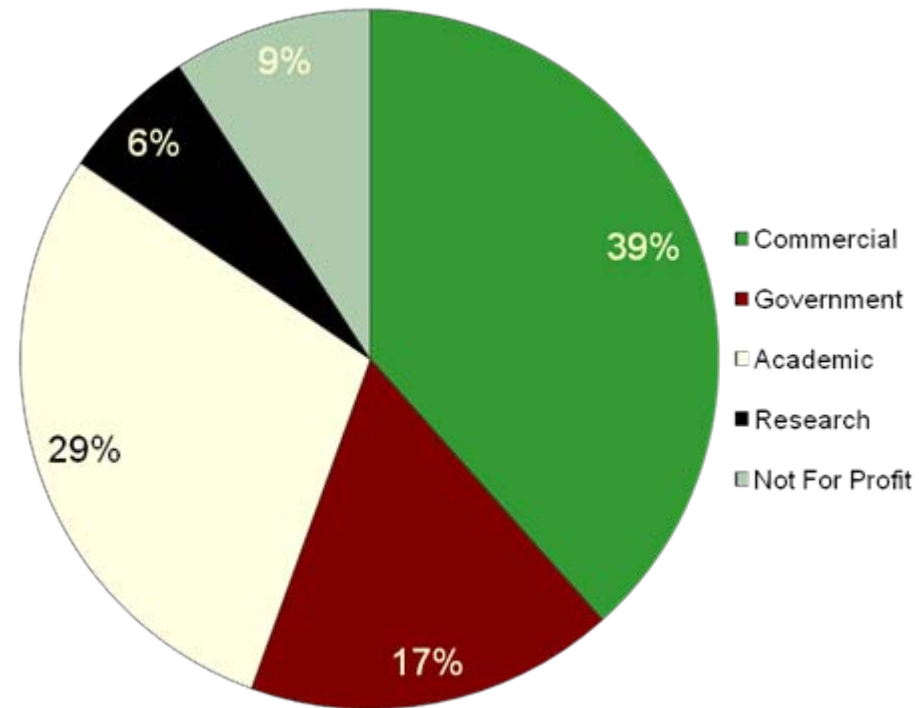


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**OGC Membership Distribution  
By Type**



# Example Member Organizations



**NORTHROP GRUMMAN**

**ORACLE®**

**Google™**



**Microsoft®**



**COMPUSULT**



**OGC®**



# Example Government Member Organizations



- DOD Australia
- Geoscience Australia
- NSW Dept of Environment and Climate Change (Australia)
- Eurocontrol
- European Environment Agency
- European Satellite Centre
- European Space Agency
- EU Joint Research Centre
- UK MOD
- UK MET Office
- METEO France
- BRGM (France)
- Ordnance Survey (UK)
- State Land Agencies (Germany)
- US DHS
- US EPA
- US FAA
- US NASA
- USGS
- US NGA
- US Census
- US NOAA
- JPEO
- Oakridge National Lab
- Natural Resources Canada
- North Carolina Dept of Environment & Natural Resources
- Dept. Science & Technology (India)
- Korea Land & Housing

# OGC Web Services Standards



Rapid discovery, access, fusion and application of location information for:

- Critical Infrastructure
- Emergency Management
- Weather Forecasting / Warning
- Climate Change
- Defense and Intelligence
- Local Government Services
- Routing / Logistics
- And many more applications...

Videocam  
Type:  
Control parameters:



Sensors

Imagery



Features





# OGC Web Services Standards



## Relevant OGC Web Services Standards:

- Web Map Service (WMS) \*
- Web Feature Service (WFS)\*
- Web Coverage Service (WCS)\*\*
- Catalogue (CSW)\*\*
- Geography Markup Language (GML) \*
- KML
- Others...



## Emphasis on Seeking Adoption through ISO / CEN

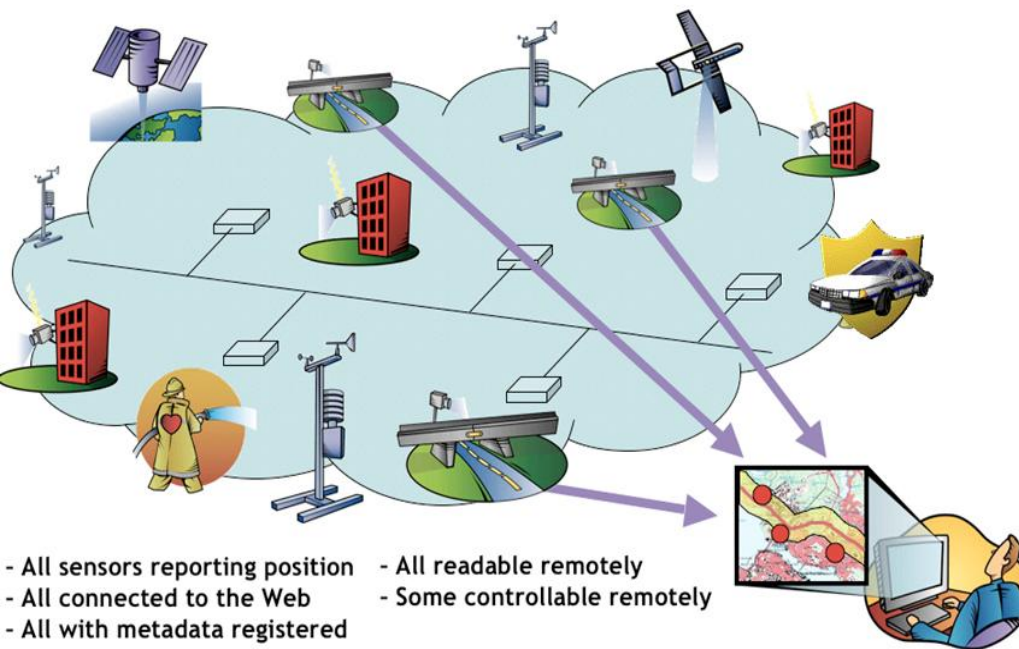
\*Adopted as ISO & CEN standards

\*\*Submitted to ISO as New Work Item

# Adding Sensor Feeds to Situational Awareness



Enables discovery and tasking of sensor assets, and the access and application of sensor observations for enhanced situational awareness



- ✓ Sensor Model Language (SensorML)
- ✓ Transducer Markup Language (TML)
- ✓ Observations & Measurements (O&M)
- ✓ Sensor Planning Service (SPS)
- ✓ Sensor Observation Service (SOS)
- ✓ Catalogue Service
- ✓ Web Notification Service (WNS)
- ✓ Sensor Alert Service (SAS)
- ✓ OASIS (alert) standards
- ✓ IEEE 1451 smart sensor standard

# Multi-source fusion for Actionable Situational Awareness Via Common Standards Baseline

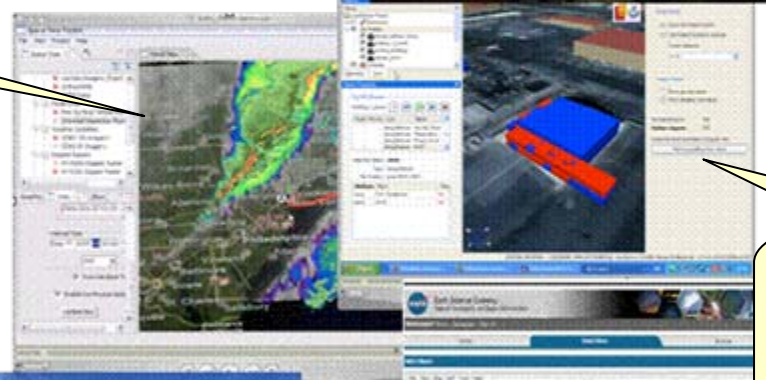


Web based integration of geospatial data from multiple distributed sources

Discovery, tasking, access and integration of real-time sensors and sensor data- fixed and mobile sensors

Standards-based Decision Support Services available to support Actionable Situational Awareness

Fusion of Building Information Models and other engineered information



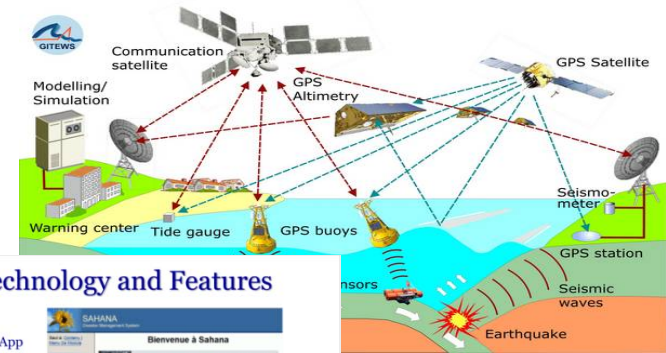
OGC Web Services Phase 4 Testbed (2006)



# Applications Leveraging OGC and Complimentary Standards for Situational Awareness and Decision Support



- Crisis / Disaster Mgt
  - German Indonesian Tsunami Early Warning System (GITEWS)
  - Sahana - Social networking platform for crises management



Source: [www.gitews.org](http://www.gitews.org)

**Sahana Technology and Features**

- Environments
  - Linux, Windows, Portable App
  - VM, LiveCD, LiveUSB
- Translation & Localization
  - Pootle, Character sets
  - Right-to-left scripting
- Messaging:
  - SMS, GPRS, e-mail
- GIS & Open Standards:
  - KML, WMS, GeoRSS, WFS
  - EDXL, CAP, JSON, XML
- Mobile Accessibility
  - Android, iPhone, iPad
  - Blackberry, NetBooks, Cellphones

27 May 2010 <http://www.SahanaFoundation.org>

Source: [www.sahanafoundation.org](http://www.sahanafoundation.org)

Source: [emergeo.com](http://emergeo.com)

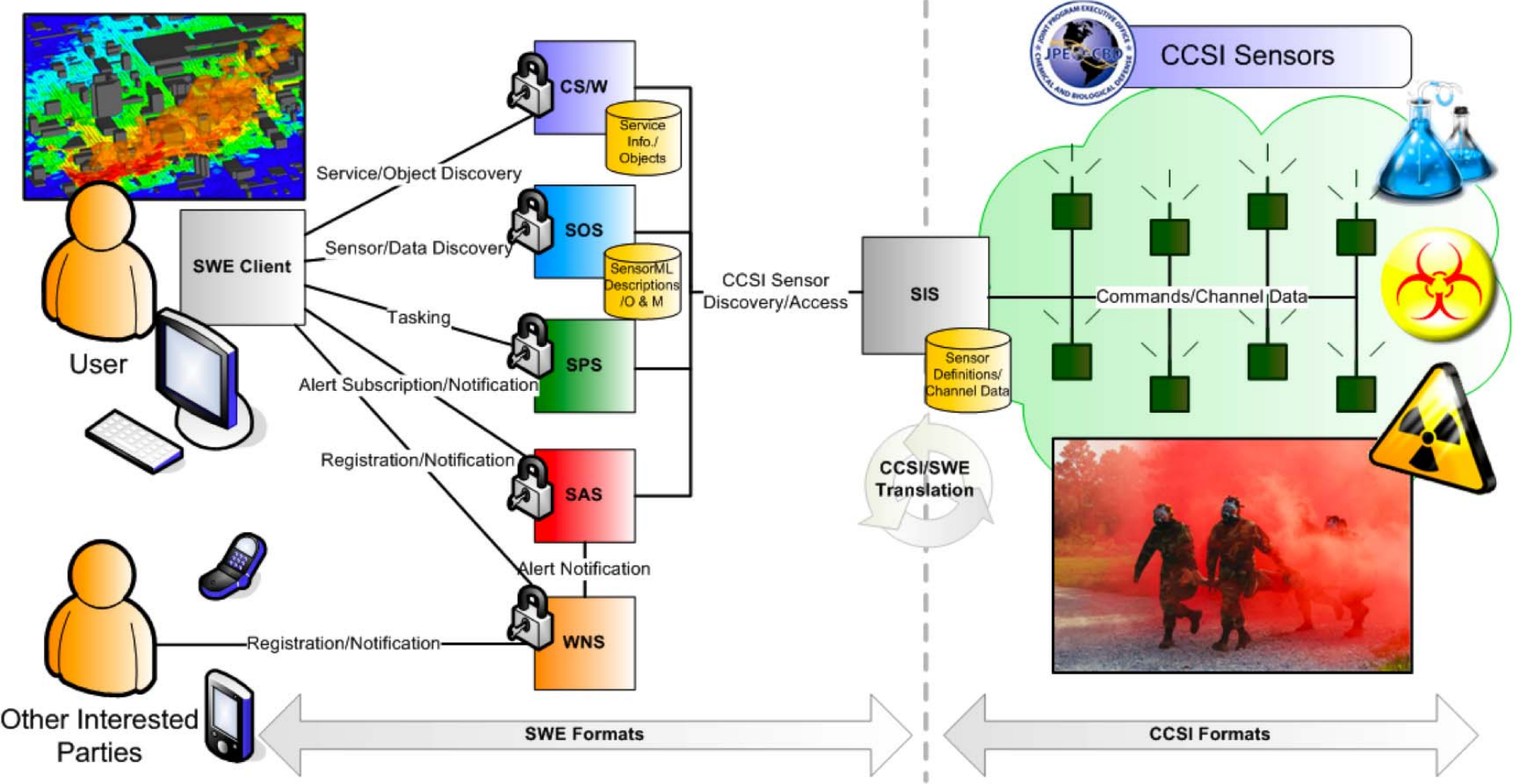


- Public Safety, Defense and Intelligence
  - PulseNet, Northrop Grumman
  - Emergeo FusionPoint



# Sensor Web Enablement in OGC Testbeds

## Standardization of Chemical, Biological, Radiological, Nuclear (CBRN) Sensors



From OGC Web Services Testbed Phases 6 and 7

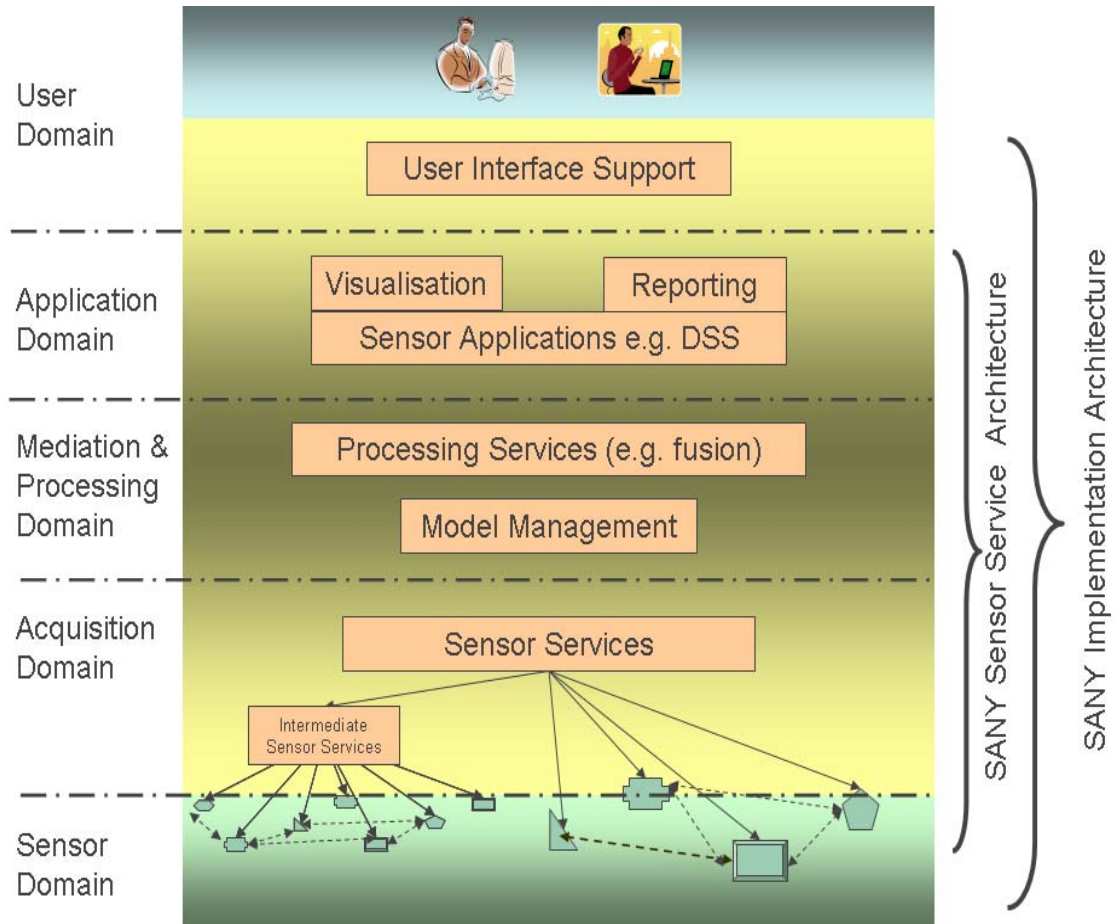
# Support to European Programs



**SANY**  
an open service architecture  
for sensor networks

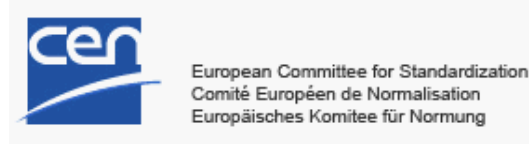
by the SANY Consortium

**S@NY**  
Sensors Anywhere



<http://www.sany-ip.eu/>

# Alliance Partnerships – Key to Addressing Increasingly Complex Standards Challenges



IJIS Institute



Others... *and many others*  
(see <http://www.opengeospatial.org/ogc/alliancepartners>)



# In Closing

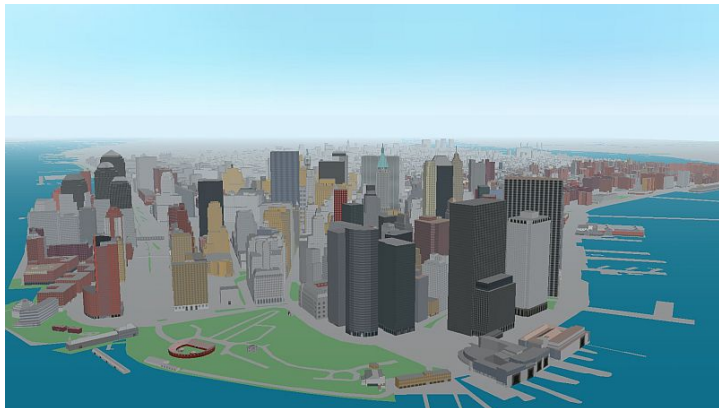
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- **OGC and complimentary ISO and CEN standards provide an interoperable location information underpinning for improved**
  - Situational awareness
  - Decision making
- **Requirements driven by user community requirements**
- **Broad implementation in the global marketplace**
- **International, multi-sector consensus process**
- **Collaboration across SDO's is key to success**



# Thank You



Source: GTA Geoinformatik GmbH, [www.gta-geo.de](http://www.gta-geo.de)



Source; Thomas Kolbe, Berlin TU

## CityGML – 3D Urban Models



# References



## OGC References:

- Approved Standards
  - [www.opengeospatial.org/standards](http://www.opengeospatial.org/standards)
- Working Groups
  - [www.opengeospatial.org/projects/groups/wg](http://www.opengeospatial.org/projects/groups/wg)
- Emergency & Disaster Management Working Group
  - [www.opengeospatial.org/projects/groups/edmdwg](http://www.opengeospatial.org/projects/groups/edmdwg)
- Reference Model
  - [www.opengeospatial.org/standards/orm](http://www.opengeospatial.org/standards/orm)
- Membership Listing by Region
  - [www.opengeospatial.org/standards/orm](http://www.opengeospatial.org/standards/orm)
- Sensor Web Enablement
  - [www.opengeospatial.org/projects/groups/sensorweb](http://www.opengeospatial.org/projects/groups/sensorweb)
- List of Implementing Products
  - [www.opengeospatial.org/resource/products](http://www.opengeospatial.org/resource/products)

## Community References:

- Sensors Anywhere (SANY) – European Framework 6 Program, Sensor Services Architecture
  - [www.sany-ip.eu/publications/3317](http://www.sany-ip.eu/publications/3317)
- US Federal Geographic Data Committee Endorsement External Standards
  - [www.fgdc.gov/standards/fgdc-endorsed-external-standards/index\\_html](http://www.fgdc.gov/standards/fgdc-endorsed-external-standards/index_html)
- Geospatial Intelligence Standards Working Group Adopted Standards
  - [www.gwg.nga.mil/](http://www.gwg.nga.mil/)