

# OpenGeospatial Consortium (OGC) Sensor Web Enablement (SWE) Framework

**Dr. Mike Botts and Alex Robin**

**Vis-Analysis System Technology (VAST) Team**

**National Space Science and Technology Center**

**University of Alabama in Huntsville**

**[mike.botts@uah.edu](mailto:mike.botts@uah.edu)**

**[swe.wg@opengeospatial.org](mailto:swe.wg@opengeospatial.org)**

**<http://vast.uah.edu/sensorML>**

## OpenGeospatial Consortium (OGC)



Consortium of 250+ companies, government agencies, and academic institutes

Open Standards development by consensus process

Interoperability Programs provide end-to-end implementation and testing before spec approval

Standard encodings (e.g. GML, SensorML, O&M, etc.)

Standard Web Service interfaces; e.g.:

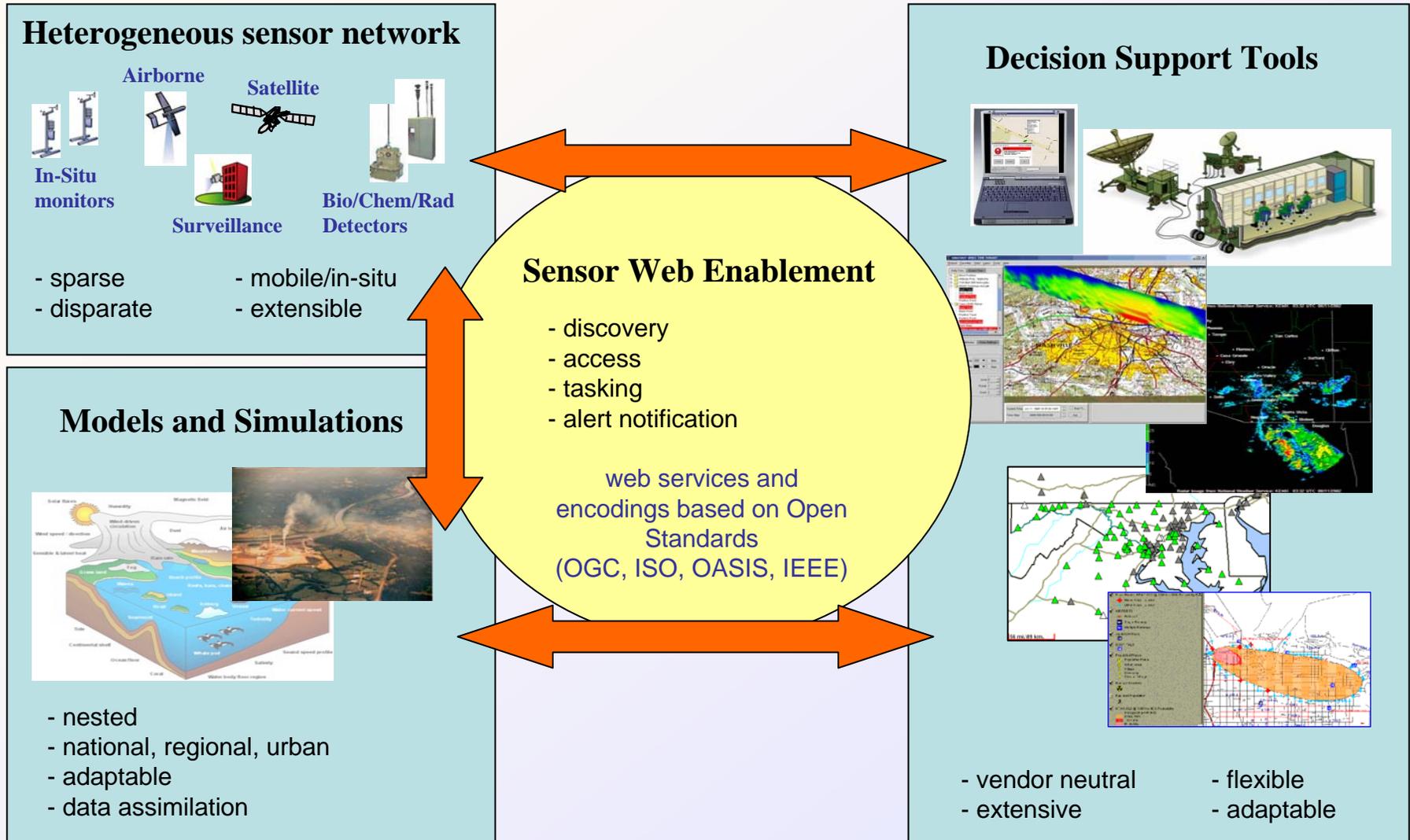
Web Map Service (WMS)

Web Feature Service (WFS)

Web Coverage Service (WCS)

# *Sensor Web Enablement*

# Sensor Web Enablement Framework



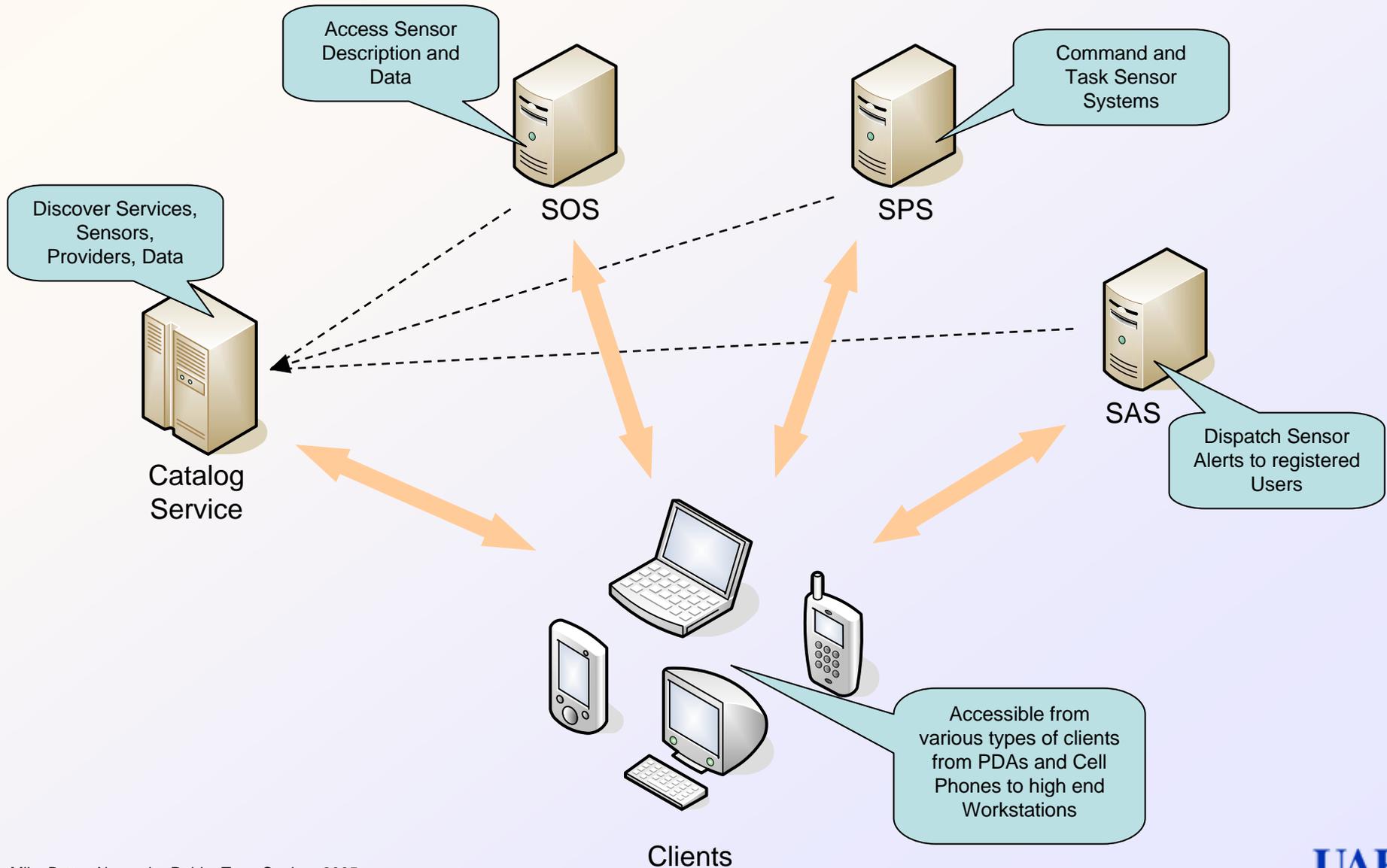


# SWE Specifications

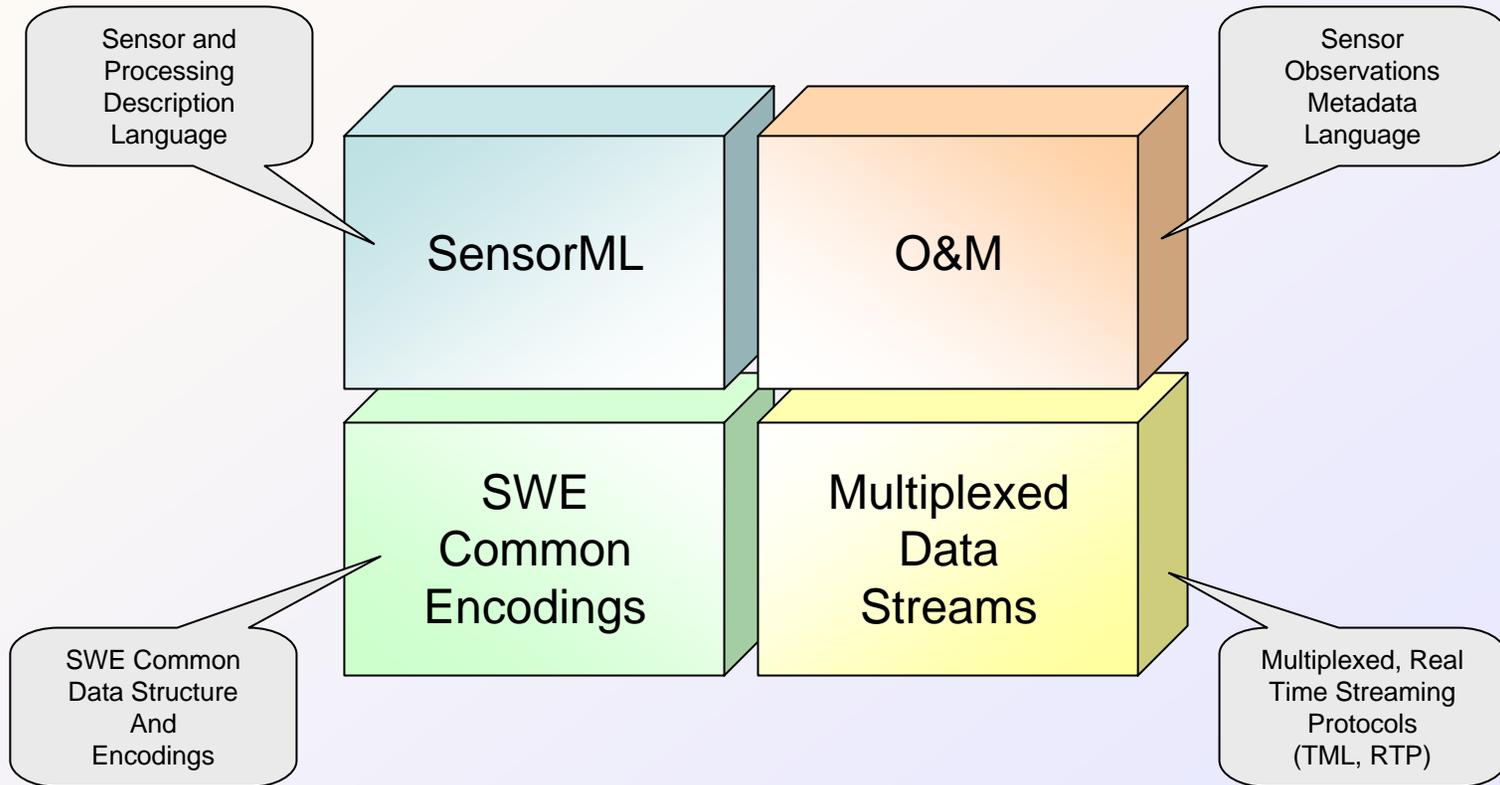
---

- Information Models and Schema
  - **Sensor Model Language (SensorML) for In-situ and Remote Sensors** - Core models and schema for components, georegistration, response, process models
  - **Transducer Model Language (TML)** – XML encoding for supporting real-time streaming sensor data
  - **Observations and Measurements (O&M)** – Core models and schema for observations
- Web Services
  - **Sensor Observation Service** - Access Observations for a sensor or sensor constellation, and optionally, the associated sensor and platform data
  - **Sensor Alert Service** – Subscribe to alerts based upon sensor observations
  - **Sensor Planning Service** – Request collection feasibility and task sensor system for desired observations
  - **Web Notification Service** – Manage message dialogue between client and Web service(s) for long duration (asynchronous) processes
  - **Sensor Registries** – Discover sensors and sensor observations

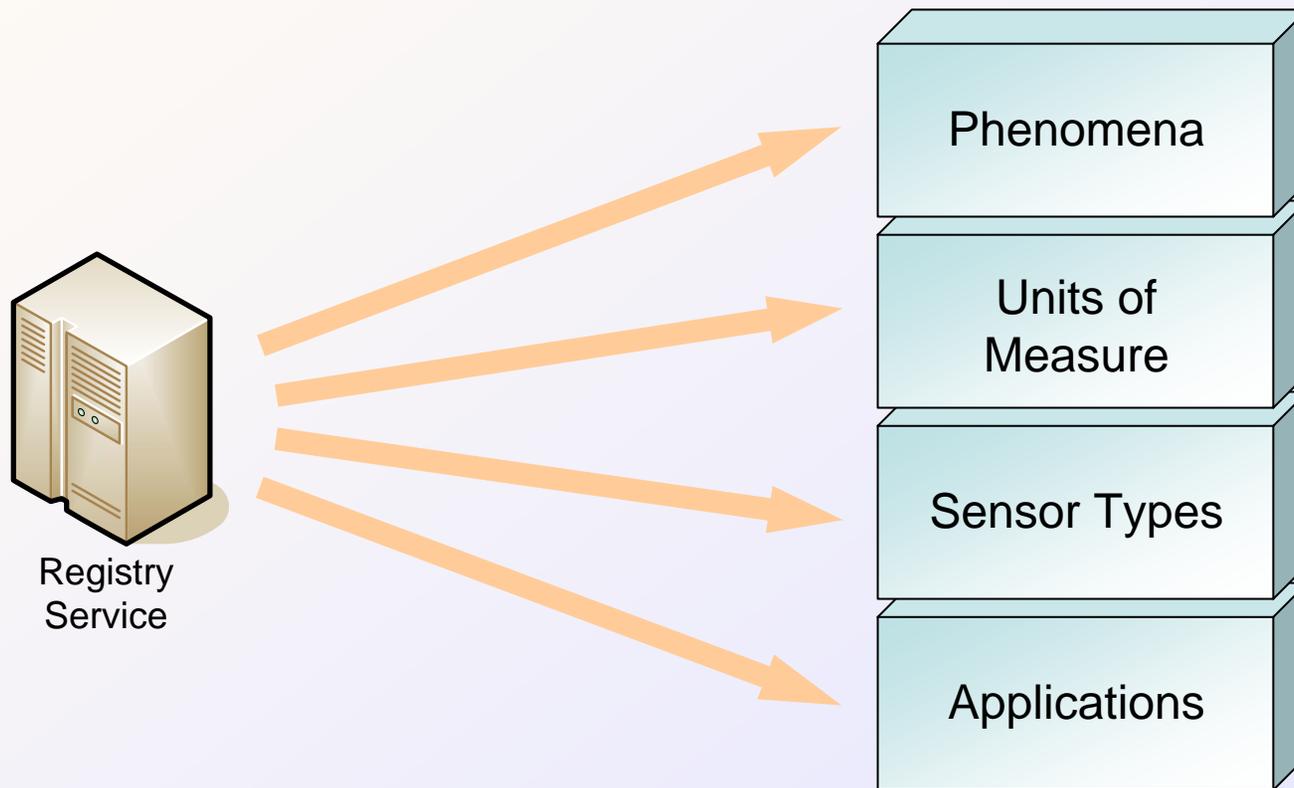
# SWE Components – Web Services



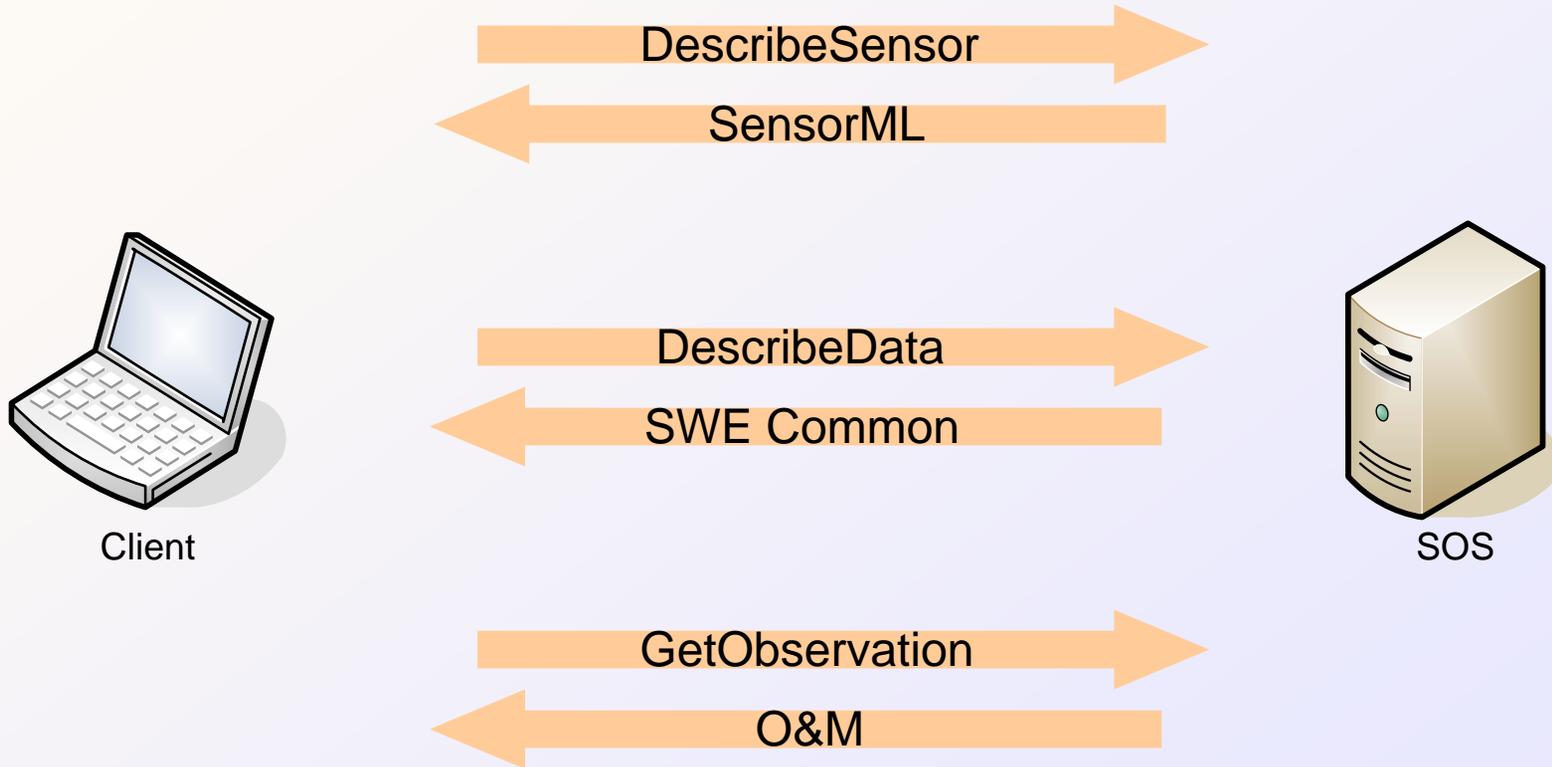
# SWE Components - Languages



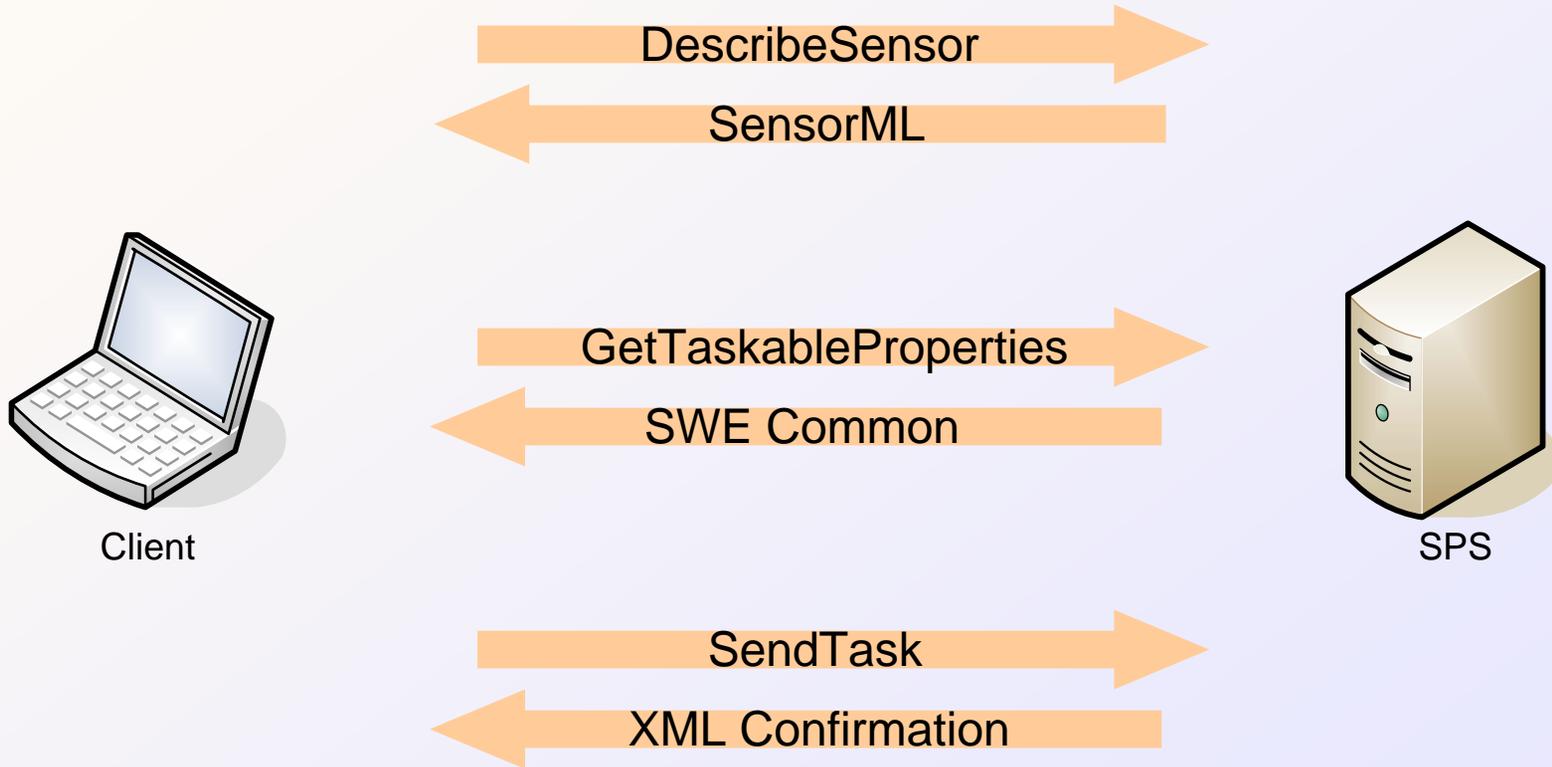
# SWE Components - Dictionaries



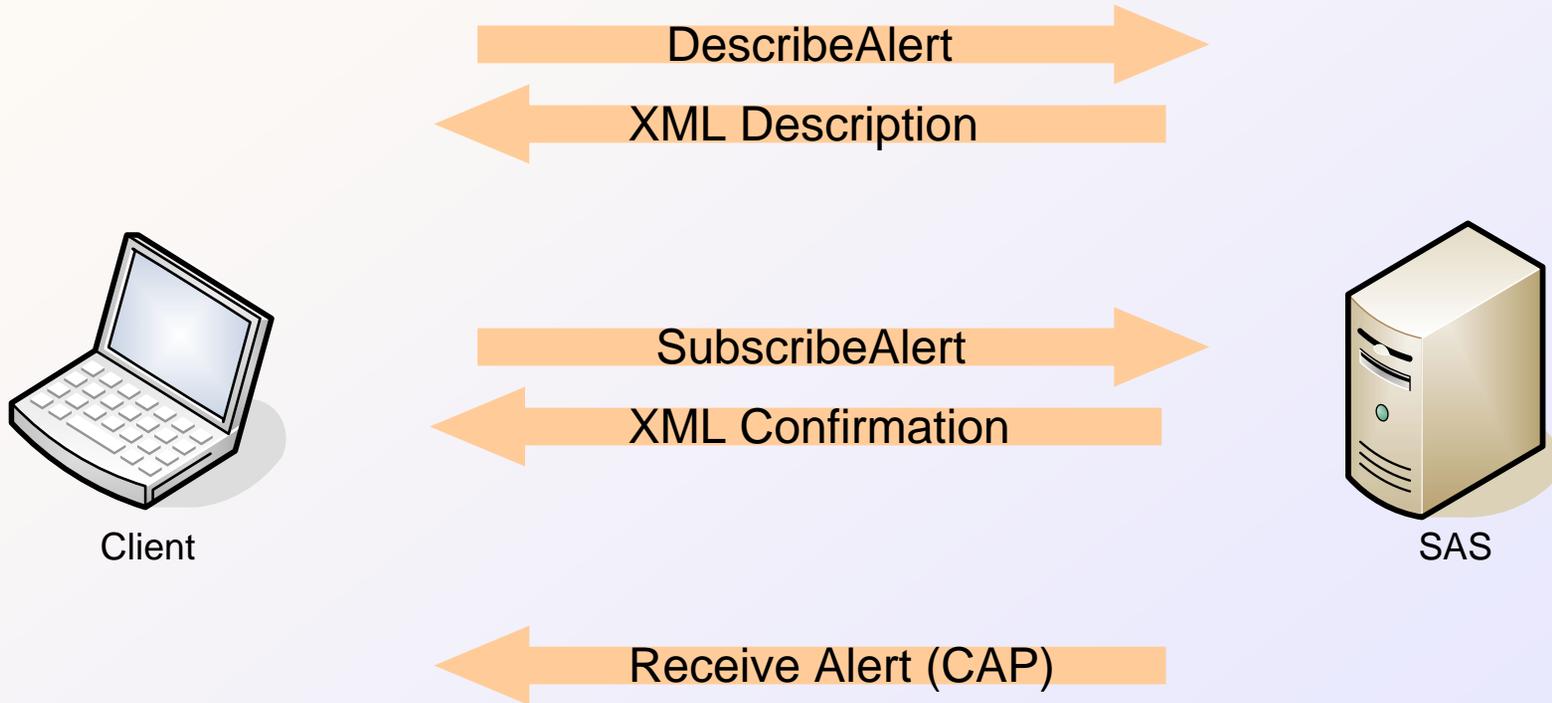
# SWE – Sensor Observation Service



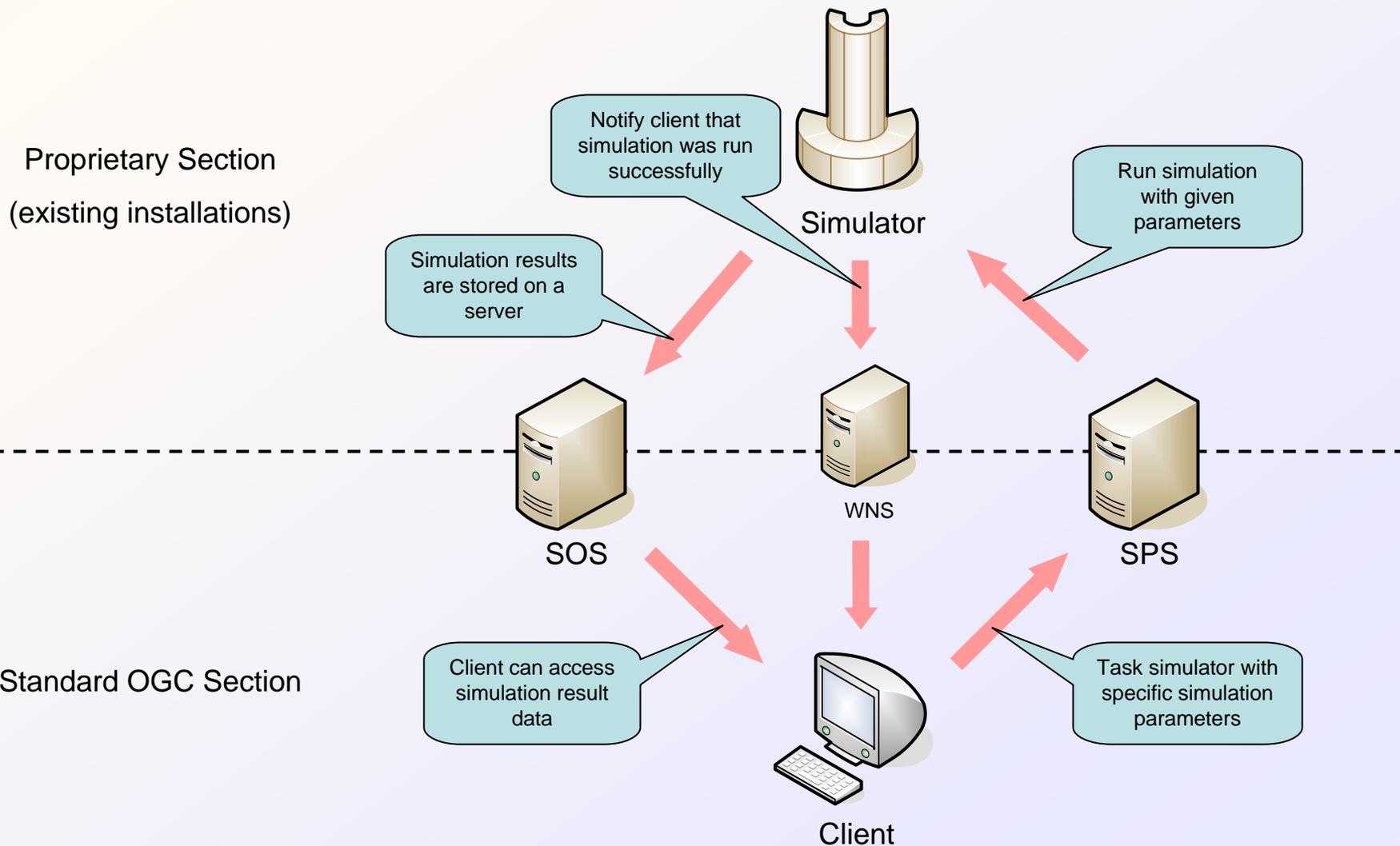
# SWE – Sensor Planning Service

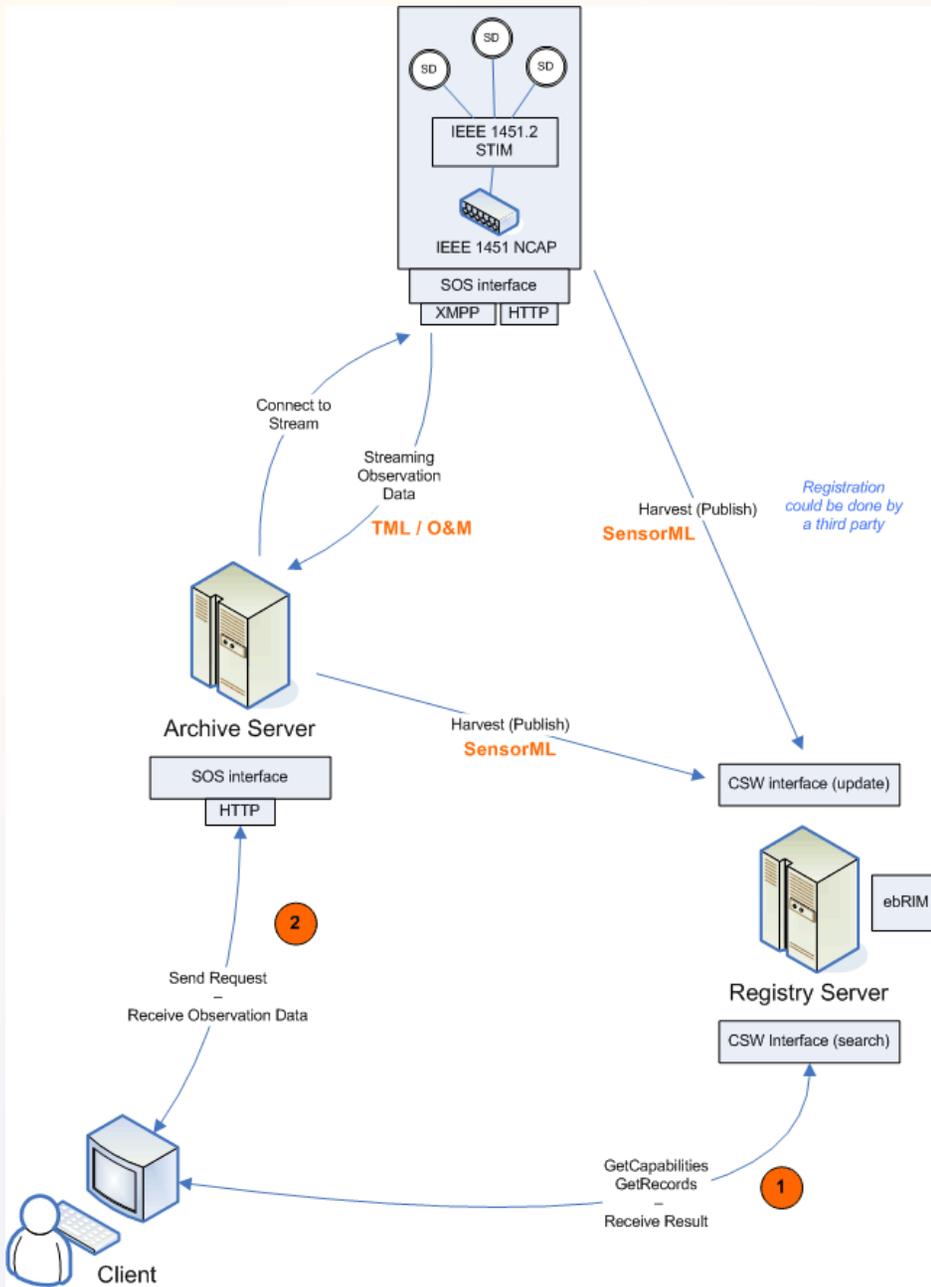


# SWE – Sensor Alert Service

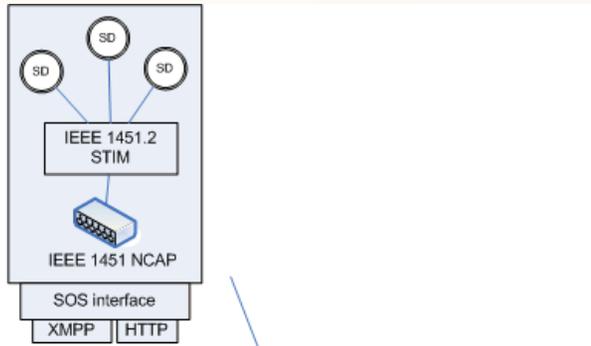


# Integration of Simulation Capabilities

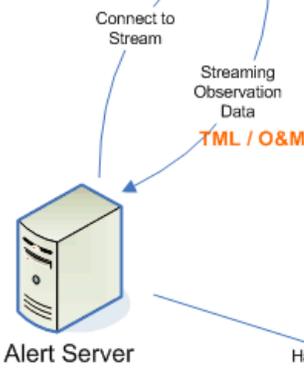




# SOS

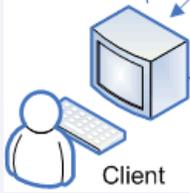
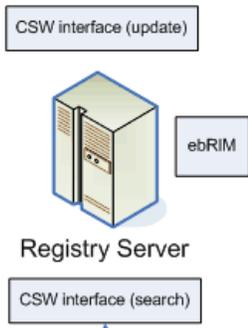


Alert Services are really a special case of stream processing services



Harvest (Publish) SensorML

Registration could be done by a third party

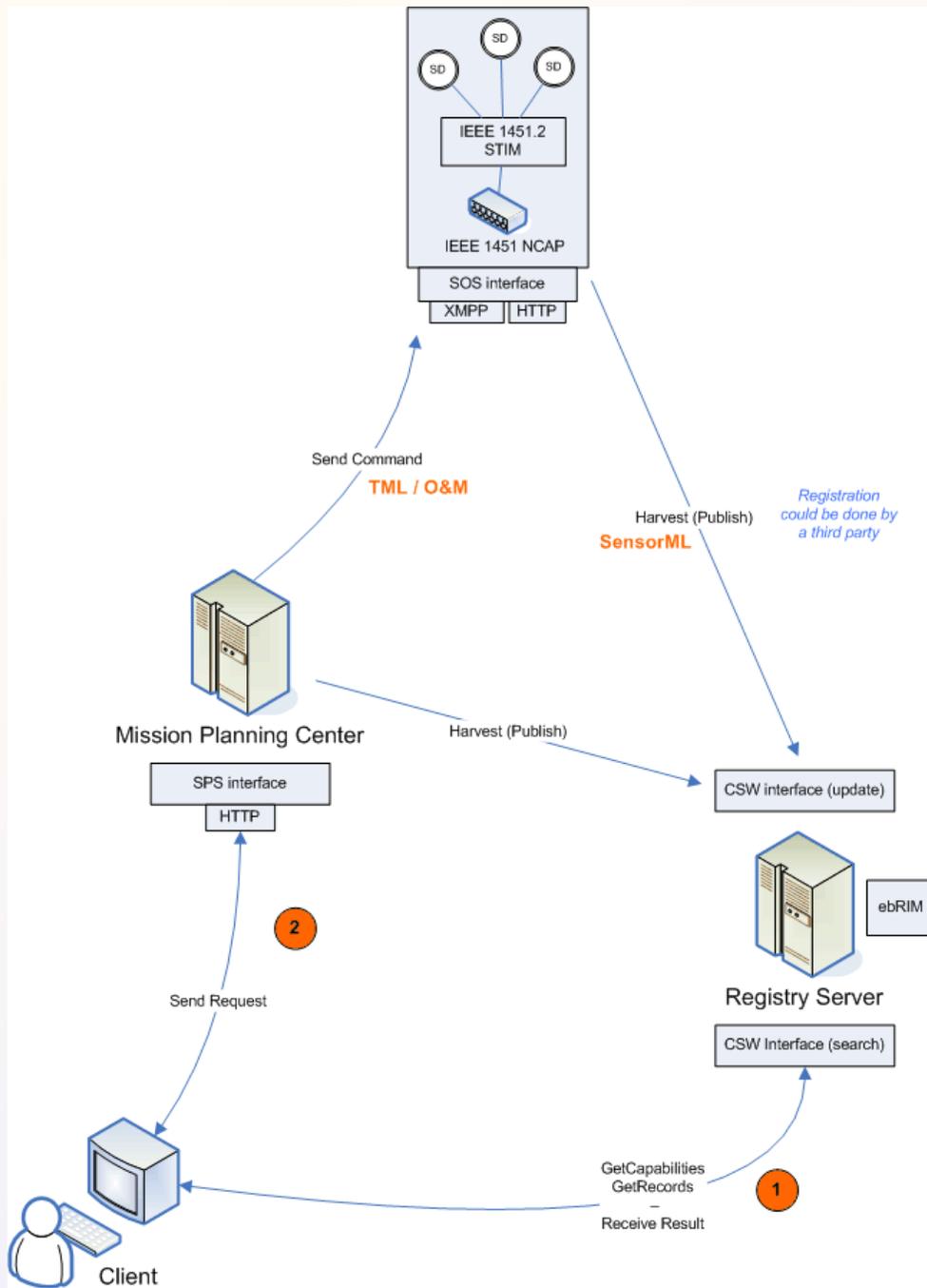


2

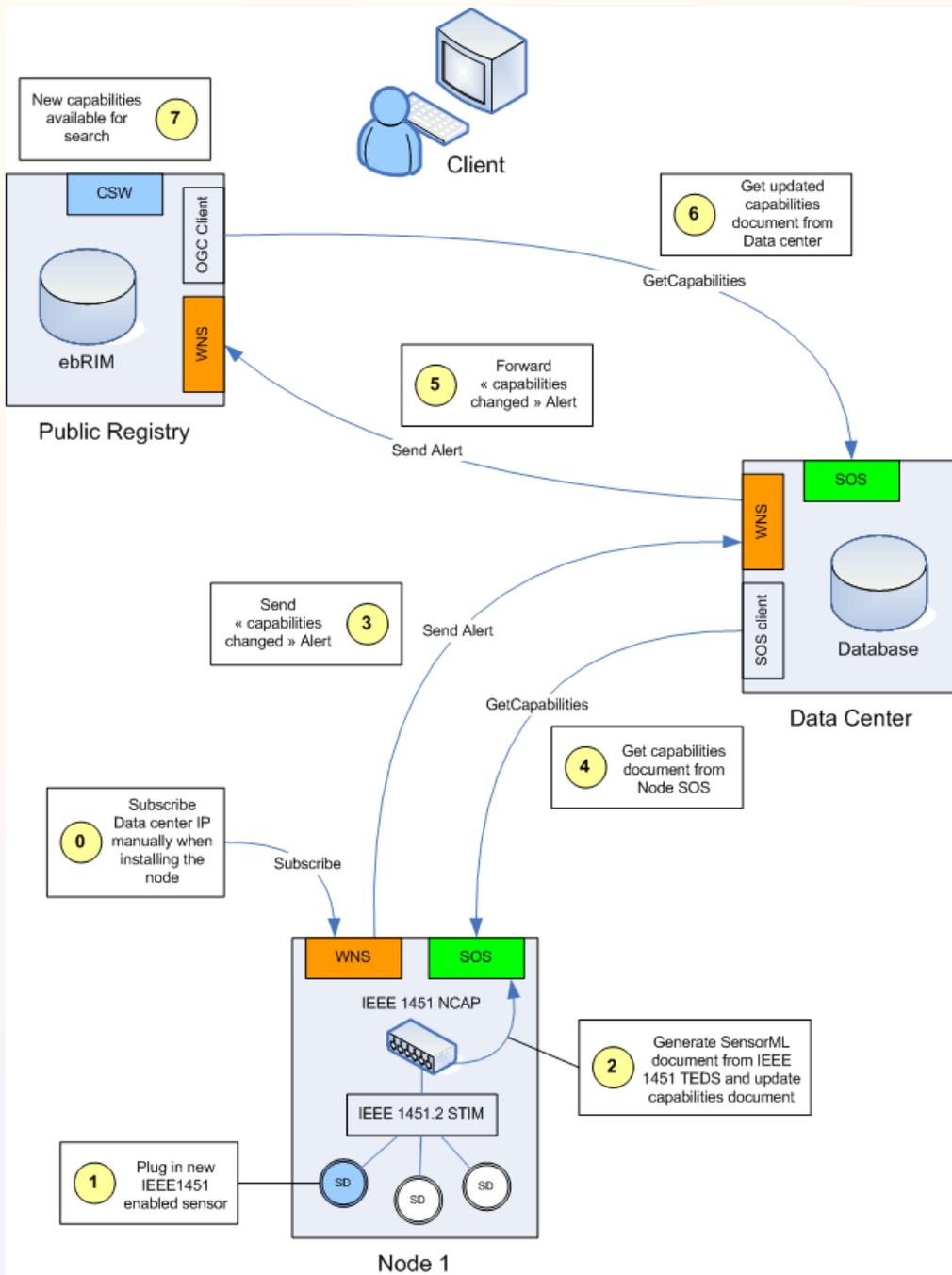
1

# SAS

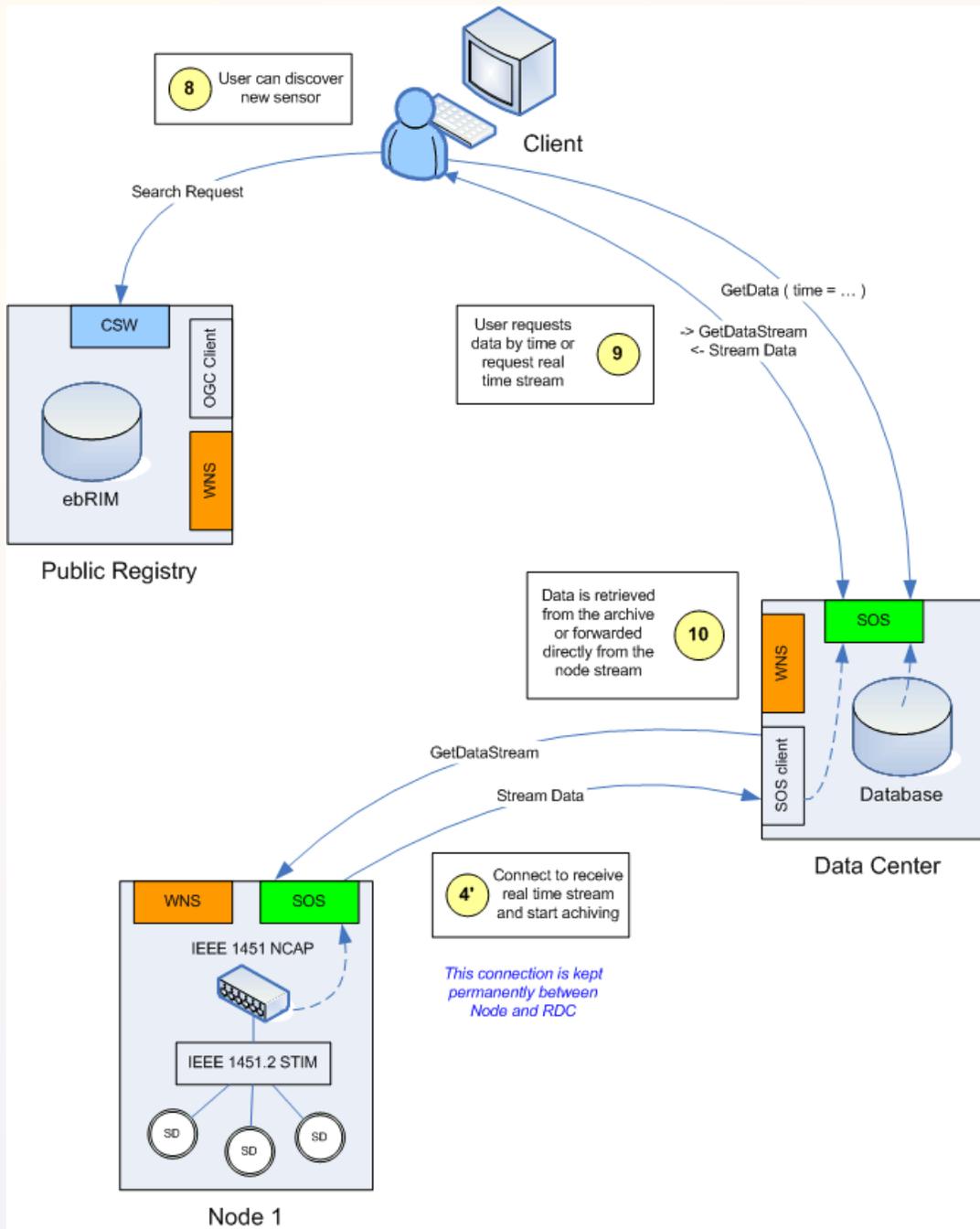




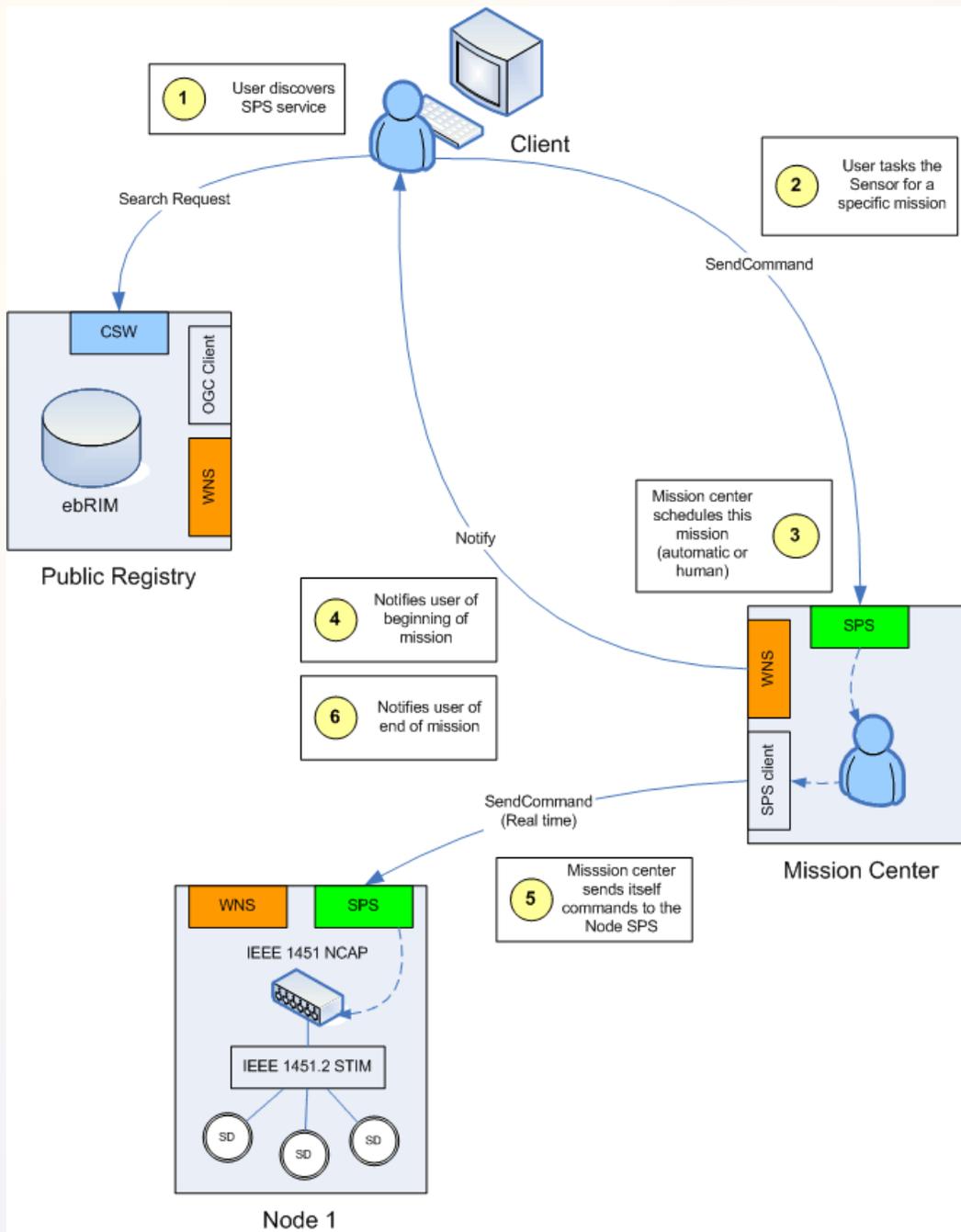
# SPS



# ORNL Plug-n-Play



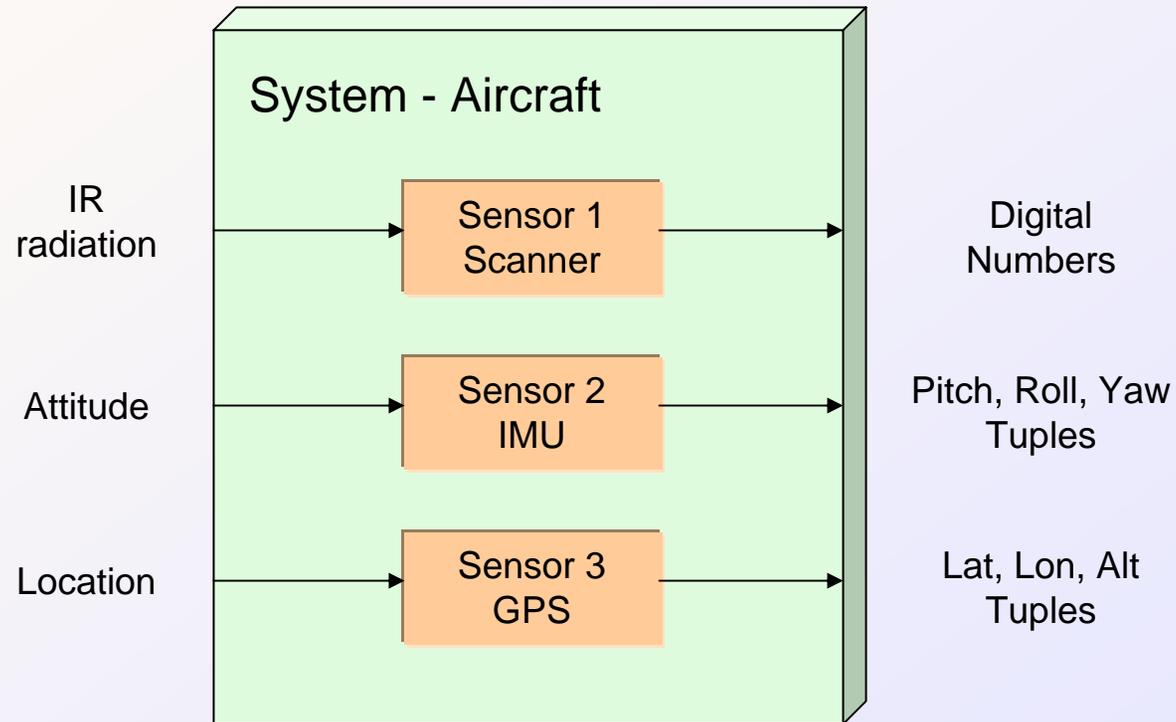
# ORNL Client Access



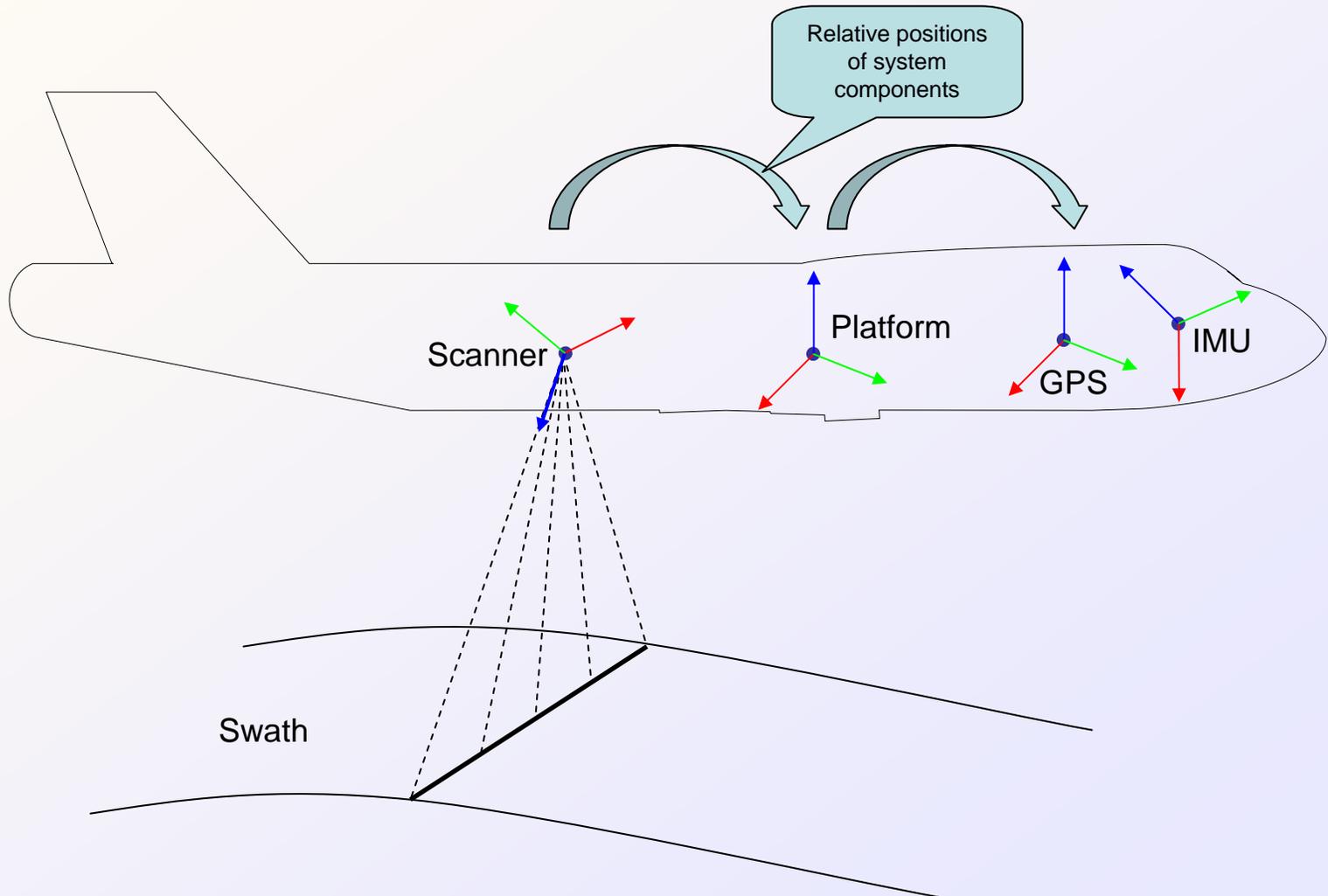
# ORNL Client Tasking

# *SensorML*

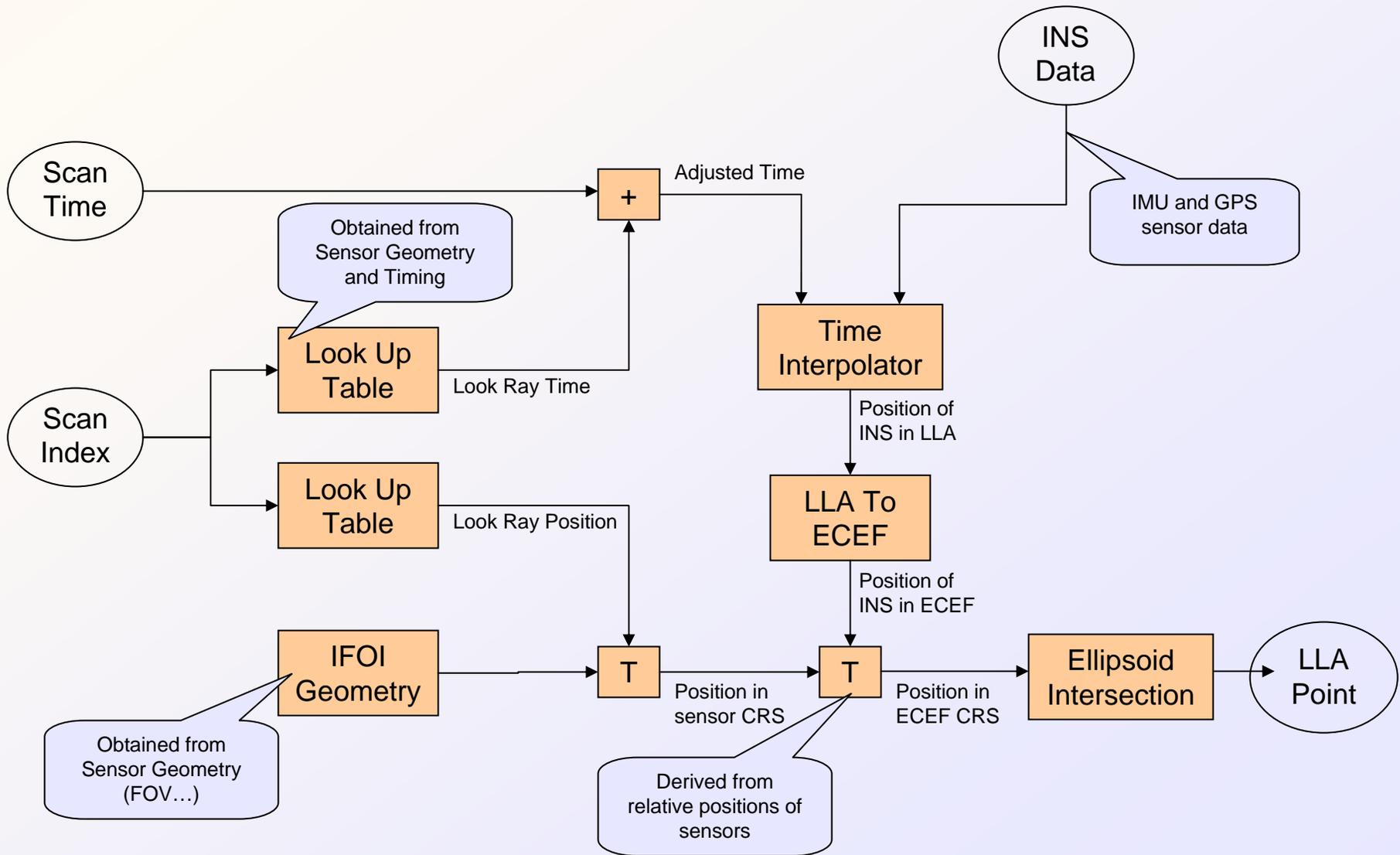
# SensorML – Sensor Systems



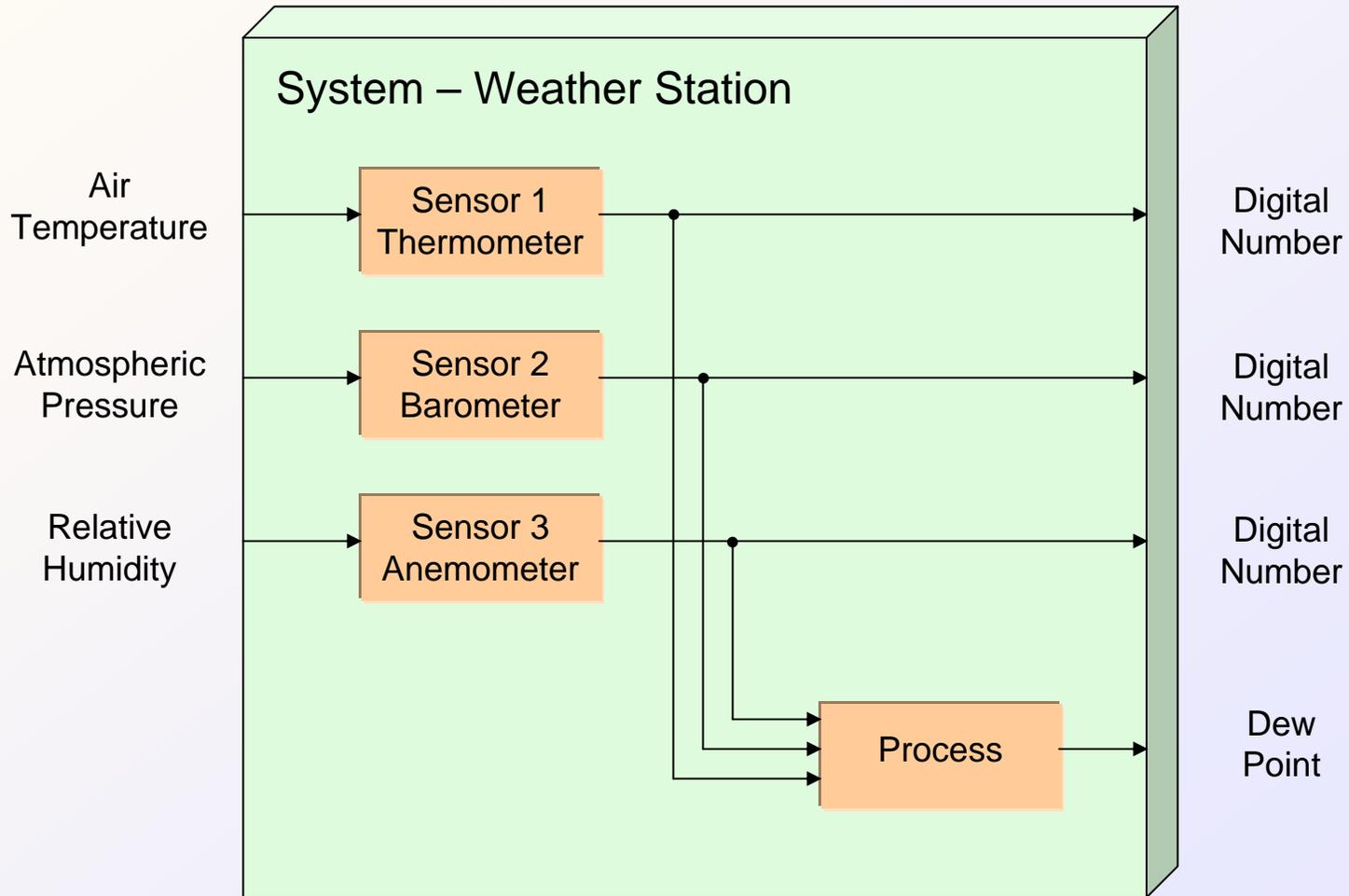
# SensorML – Relative Positions



# SensorML – Processing Chain



# SensorML – Sensor Systems



# Relevant Links

Open Geospatial Consortium

<http://www.opengeospatial.org>

SensorML

<http://vast.uah.edu/SensorML>

Space Time Toolkit

<http://vast.uah.edu/SpaceTimeToolkit>

