Observations, Measurements and Samples 3.0

Developer Workshop, 120th OGC Member Meeting
15th September 2021

Ilkka Rinne / Spatineo
Chair, OGC O&M SWG

About Observations, measurements and samples standard

Observations, measurements and samples (OMS):
A conceptual schema for observations, for features involved in the observation process, and for features involved in sampling when making observations. Note: Observations may be also predictions of a future state of the observed universe, such as weather forecasts.

A brief history

OMS originates from OGC's Sensor Web Enablement (SWE) activity around 2003 (Observations and measurements, O&M)

Version 1.0 of the Observations and measurements UML model and XML Schema published as an OGC Implementation Standard in 2007:
- Part 1: Observation schema 07-022r1
- Part 2: Sampling features 07-002r3

Version 2.0 of the Observations and measurements UML model jointly published as an OGC Abstract Specification Topic 20 (10-004r3) and ISO 19156:2011 between 2011-13

The new Observations, measurements and samples (OMS) specification version 3.0 is the result from a joint ISO/TC 211 - OGC revisioning work started in 2019, and is scheduled to be published as an ISO Draft International Standard and as the new version on the OGC Abstract Specification Topic 20 in fall 2021.

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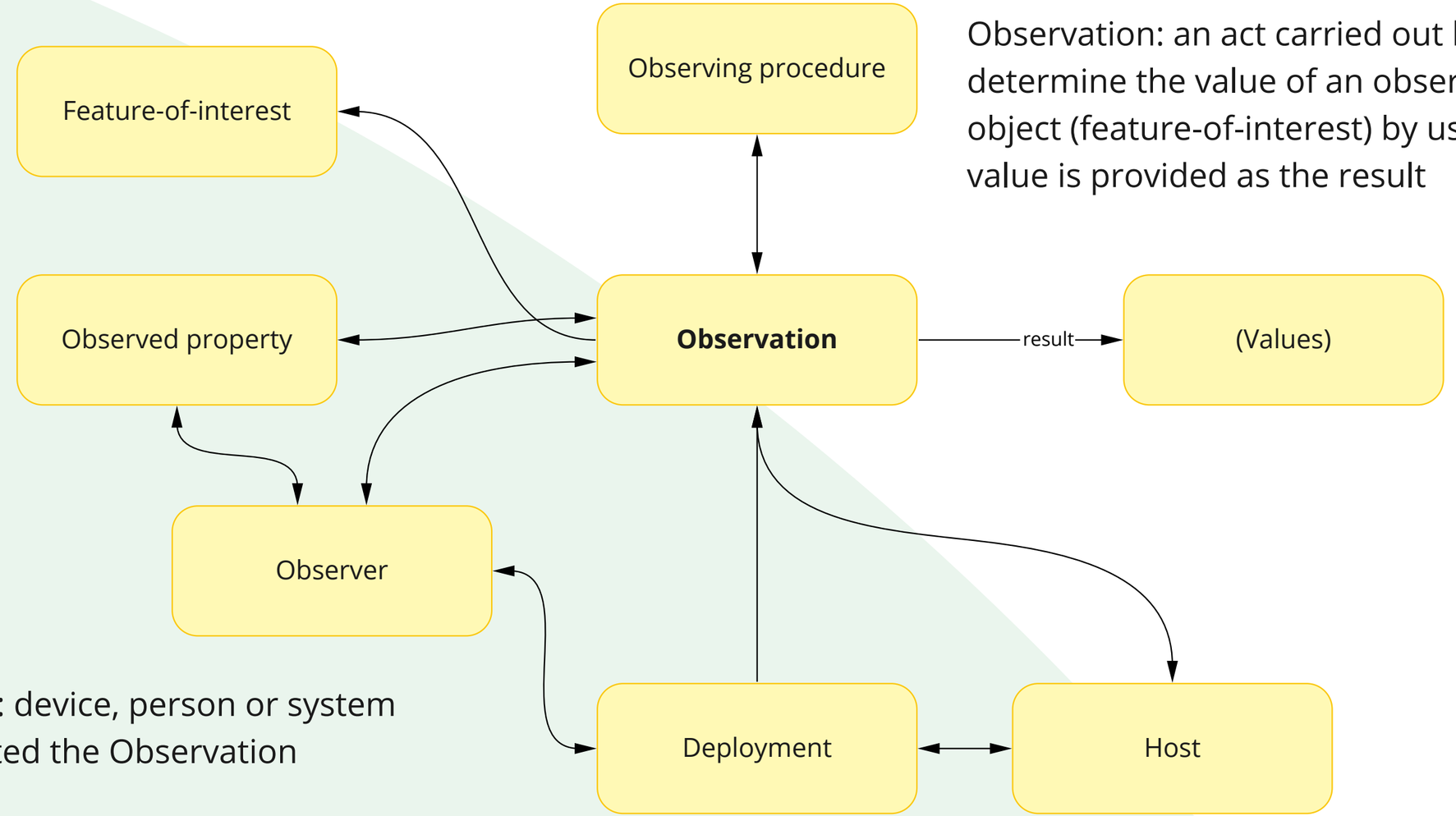
Primary OMS concepts



Observation: an act carried out by an observer to determine the value of an observable property of an object (feature-of-interest) by using a procedure; the value is provided as the result

Observer: device, person or system that created the Observation

Deployment on a Host: Physical or logical attachment of the Observer at the time of the Observation event, such as sensor platform, measurement station or campaign

Three levels of abstraction in OMS v3.0

1. Conceptual Observation and Sample schemas

The high-level concepts of OMS defined as UML interfaces

2. Abstract Observation and Sample cores

Abstract classes for OMS concepts following ISO 19109 General Feature Model

All associations defined via the Conceptual schema interfaces, allows for truly modular implementation and choosing between feature and non-feature style implementations for each concept

3. Basic Observations and Samples

Concrete application schema for with feature implementation classes for each concept defined in the abstract core packages

Additional utility classes: Observation and Sample collections, observing capability

Example use cases for OMS

Collecting and analysing observation and/or forecast data from various sources, such as different sensors, prediction models, citizen observations, retaining information regarding the data origin, observation methods, data quality and the linking to target objects under observation.

Information-rich data exchange scenarios between environmental information systems requiring a common semantic interoperability layer, such as Smart Cities or Climate change research datasets.

Generally, when you need to be able to provide more information about the observation capturing act than just the measured value in an interoperable way.

Implementing Observations, measurements and samples

XML Implementation of the O&M v2.0 is an OGC standard 10-025r1 published in 2011, revision to match OMS v3.0 expected in 2023

SensorThings API Part 1: Sensing v1.1(OGC 18-088) uses O&M v2.0 concepts as the basis of its navigable object graph structure. Mapping to OMS v3.0 concepts expected in version 2.

Joint W3C - OGC Semantic Sensor Network Ontology (SSN/SOSA) is closely related to the OMS v3.0, future harmonisation expected between ISO 19156 and SSN/SOSA.

OGC O&M Standards Working Group is currently working on a new OGC standard for a JSON implementation of the OMS v3.0 concepts, please follow the O&M SWG on Github.

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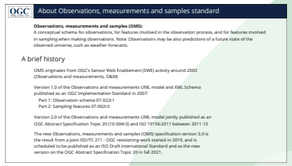
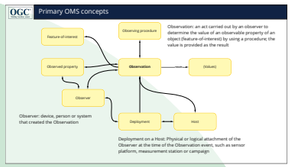
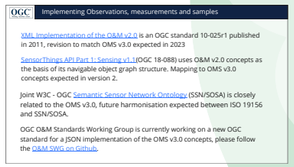
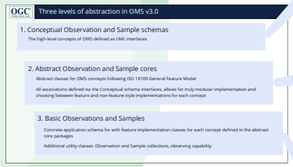
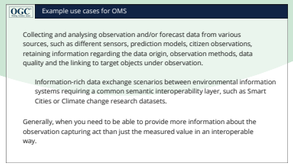




OBSERVATIONS, MEASUREMENTS AND SAMPLES 3.0





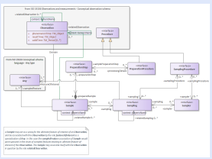


Stay tuned for the SensorThings API practical block at 06:45am - 08:15am EDT!

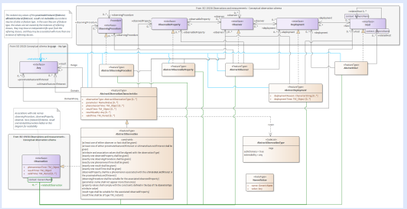
UML details for the brave...

Conceptual Observation schema

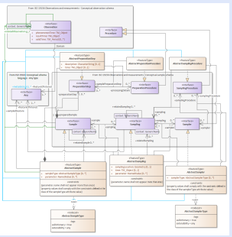
Conceptual Sample schema



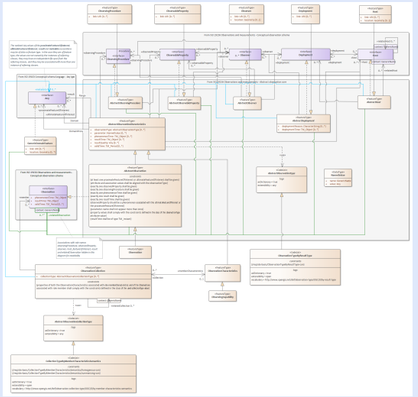
Abstract Observation core



Abstract Sample core



Basic Observations



Basic Samples