OGC SensorThings API

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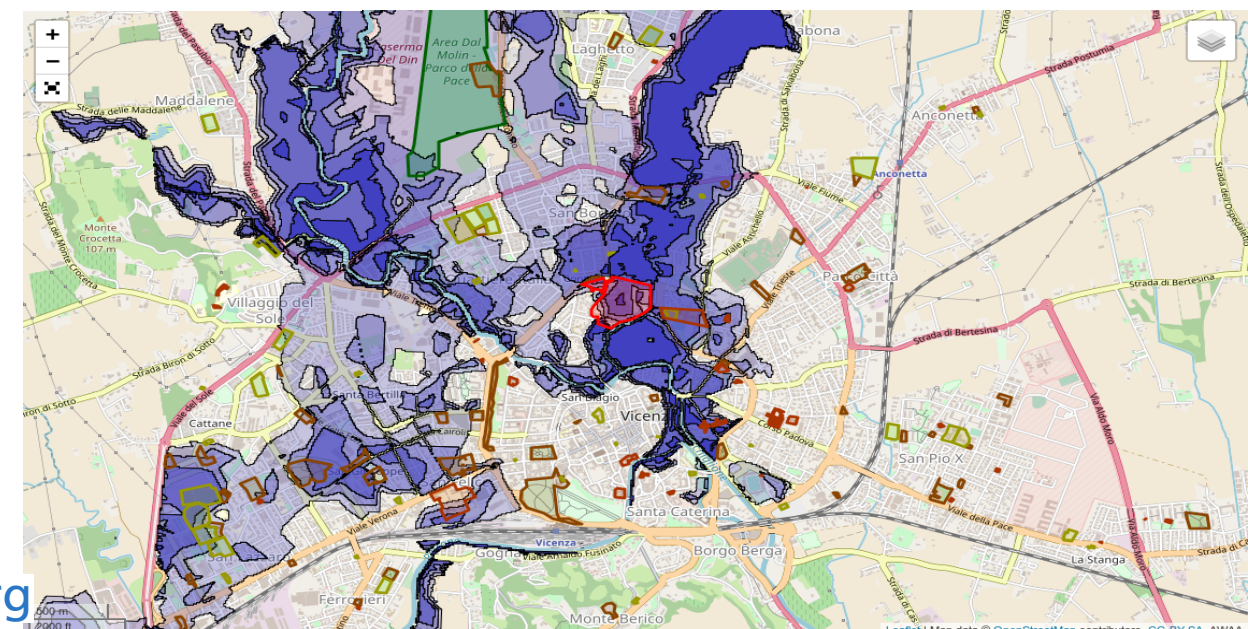
IOSB

Open Geospatial Consortium

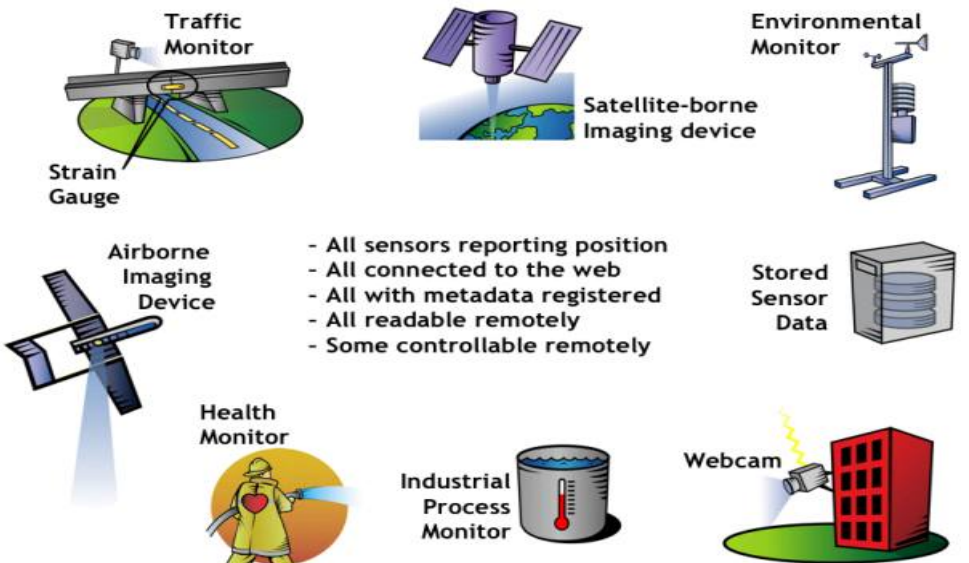
- International consortium
  - over 522 companies, government agencies and universities
- “Geo-enable” mainstream IT
- Develop publicly available interface standards
  - Maps (Web Map Service)
  - CityGML
  - WaterML
  - Earth Observations
- Conformance testing



- http://www.opengeospatial.org

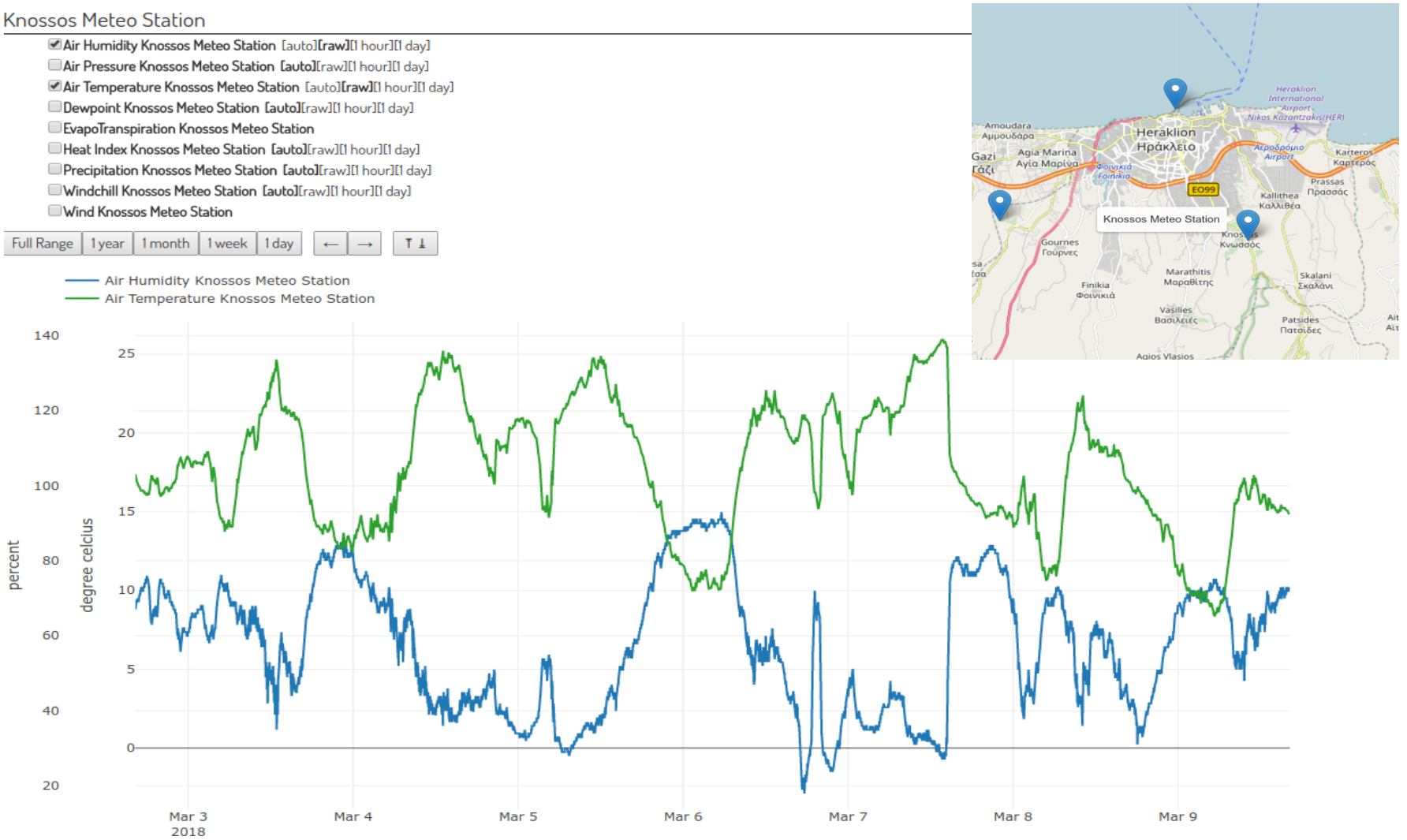
OGC & IoT?

- IoT deals with Sensors and Actuators
- Sensors and Actuators have Location
- OGC Sensor Web Enablement (SWE)
  - Enable developers to make *all types* of sensors, transducers and sensor data repositories discoverable, accessible and useable via the Web
  - Since 1990 by NASA
  - Since 2001 in OGC
  - SensorML
    Sensor Observation Service (SOS)
    Sensor Planning Service (SPS)
  - Sensor Data & Metadata



©OGC: http://www.opengeospatial.org/ogc/markets-technologies/swe

Sensor Metadata?



Sensor Metadata!

WIRED Nov. 10, 1999: Metric Math Mistake Muffed Mars Meteorology Mission

LISA GROSSMAN 11.10.10 07:00 AM

NOV. 10, 1999: METRIC MATH MISTAKE MUFFED MARS METEOROLOGY MISSION

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Thursday, September 30, 1999 Published at 18:53 GMT 19:53 UK

Sci/Tech

Confusion leads to Mars failure

The Mars Climate Orbiter: Now in pieces on the planet's surface

The Mars Climate Orbiter Spacecraft was lost because one Nasa team used imperial units while another used metric units for a key spacecraft operation.

Sci/Tech Contents

Relevant Stories

24 Sep 99 | Sci/Tech
Scientist fights Mars setback

23 Sep 99 | Sci/Tech
Mars probe feared destroyed

23 Sep 99 | Sci/Tech
What the loss of Mars Climate Orbiter means

17 Jul 99 | Sci/Tech
Astronauts call for Mars mission

Internet Links

Mars Climate Orbiter

The BBC is not responsible for the content of external internet sites.

From SWE to SensorThings

- “Old” SWE Standards
  - XML Encoded
  - SOAP bindings
  - Requires tools for use
  - Complex in use
    - No easy browsing
    - No pagination
    - No pub/sub
    - No updating
    - No delete

Time for an update → SensorThings API

OGC SensorThings API

- A standard for exchanging sensor data and metadata
  - Historic data & current data
  - JSON Encoded
  - RESTful
  - Adapting OASIS Odata URL patterns and query options
  - Supporting ISO MQTT messaging
- Easy to use & understandable
  - Discoverable with only a web browser

How does it work?

- Part 1: Data model
  - Which entities exist
  - How are they linked
- Part 2: URL patterns for queries
  - How do I get & search data
  - How do I add data
  - How do I modify data
  - How do I delete data

REST
&
MQTT

Open Source Server Implementations

- FROST-Server (Fraunhofer IOSB)
  - JavaEE / PostgreSQL / Postgis
  - the first complete, open-source server implementation
  - https://github.com/FraunhoferIOSB/FROST-Server
- GOST (Geodan)
  - GO / PostgreSQL / Postgis
  - https://github.com/gost/home
- Mozilla Sensorweb (Mozilla)
  - NodeJS / PostgreSQL / Postgis
  - https://github.com/mozilla-sensorweb/sensorthings
- Kinota Big Data (CGI)
  - Java / Spring Boot / Cassandra
  - https://github.com/kinota/kinota-bigdata

Open Source Client Implementations

- FROST-Client (Fraunhofer IOSB)
  - Java
  - https://github.com/FraunhoferIOSB/FROST-Client
- Sensorthings-net-sdk (Geodan)
  - .NET
  - https://github.com/gost/sensorthings-net-sdk
- GOST Dashboard
  - JavaScript
  - https://github.com/gost/dashboard-v2
- SensorThings-Dashboard (KIT)
  - JavaScript
  - https://github.com/SensorThings-Dashboard/SensorThings-Dashboard

Future

- Version 1.1 & new extensions in progress
  - JSON properties for all Entity types
  - Better support for moving Things
- Actuators
  - SensorThings API Part II: Tasking Profile
    Published as a standard
    http://docs.opengeospatial.org/is/17-079r1/17-079r1.html

Finally

- OGC SensorThings API
  Because Metadata matters
  https://github.com/opengeospatial/sensorthings

- FROST
  https://github.com/FraunhoferIOSB
  In 5 steps
  https://github.com/FraunhoferIOSB/FROST-Server/wiki/Docker-Quick-Start

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