

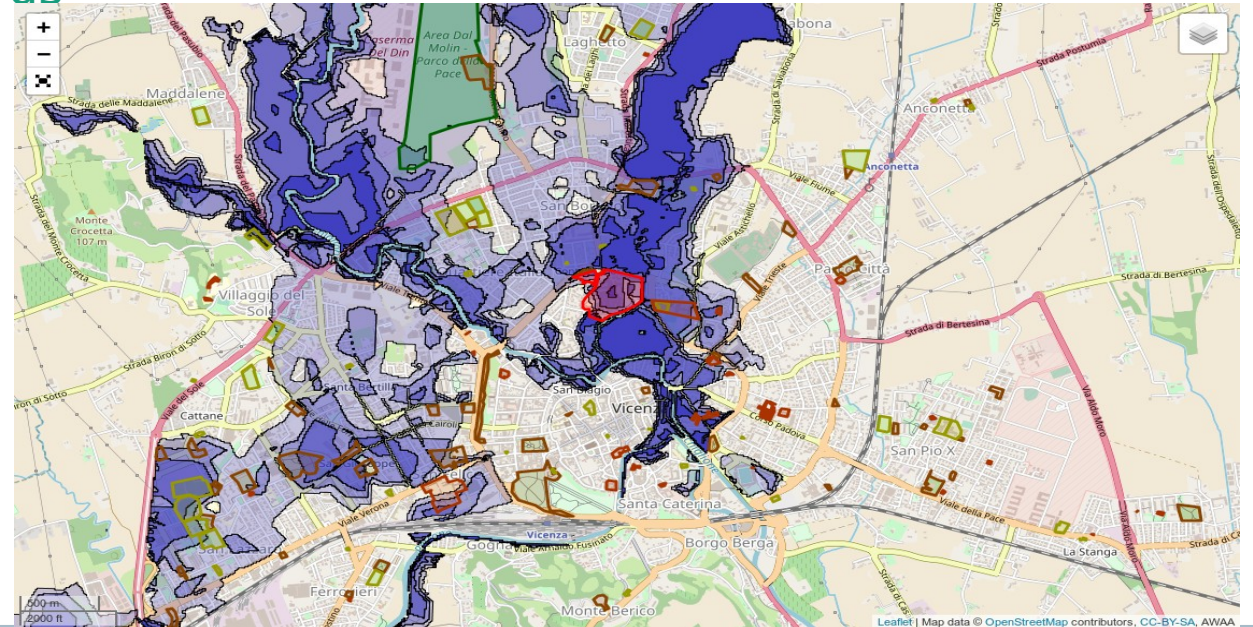
OGC SensorThings API

Dr. Hylke van der Schaaf

Open Geospatial Consortium

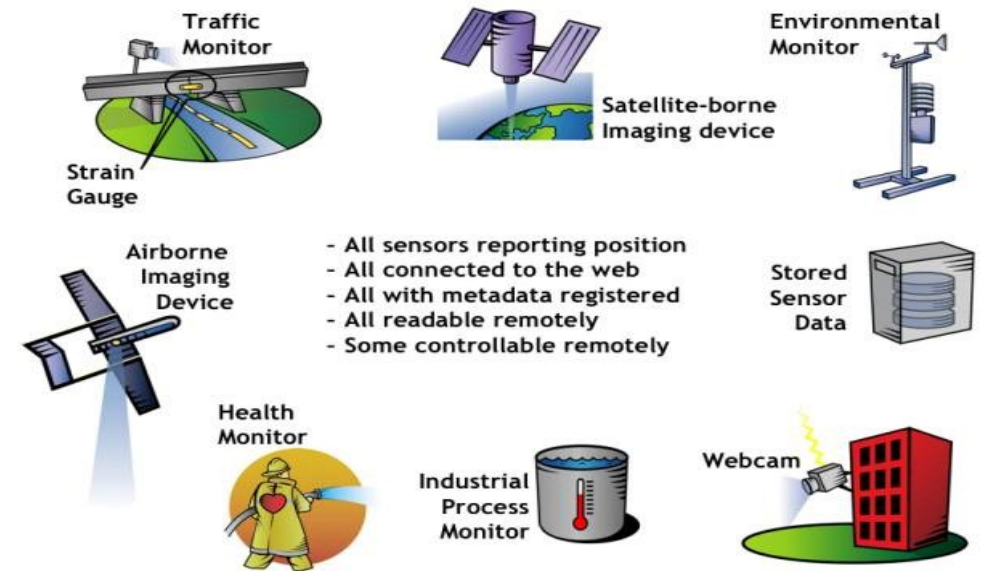


- International consortium
 - over 522 companies, government agencies and universities
- “Geo-enable” mainstream IT
- Develop publicly available interface standards
 - Maps (Web Map Service)
 - CityGML
 - WaterML
 - Earth Observations
- Conformance testing
- <https://www.ogc.org/>



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 → 2001 in OGC
 - SensorML
 - Sensor Observation Service (SOS)
 - Observations & Measurements (O&M)
 - Sensor Data & Metadata
 - Core of INSPIRE



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

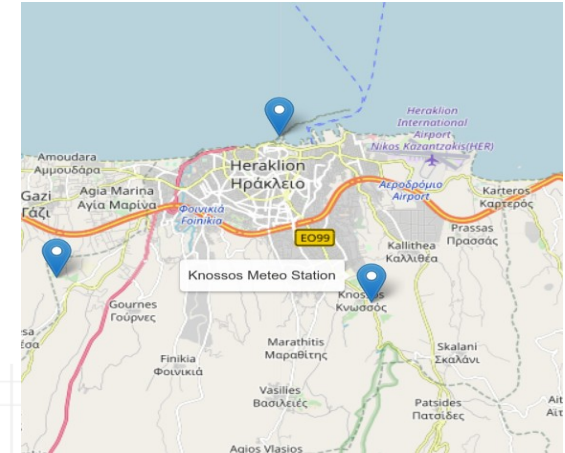
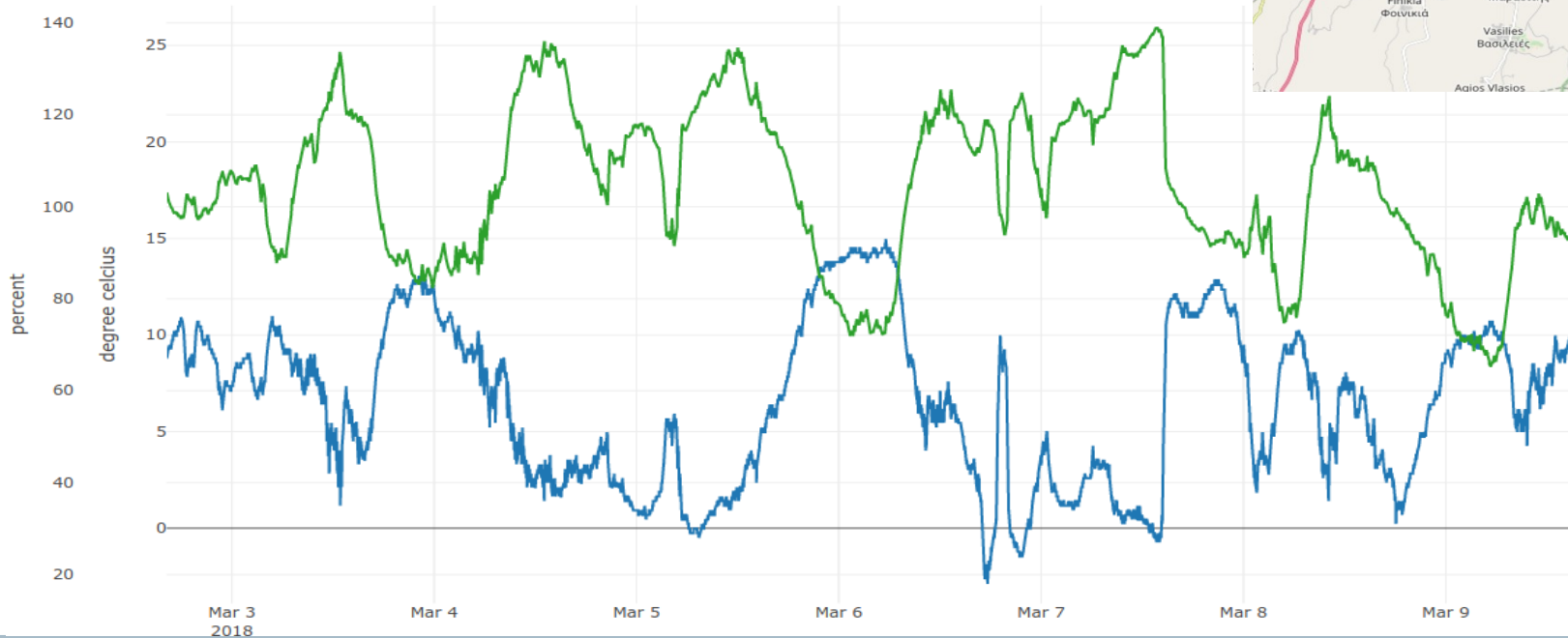
Sensor Metadata?

Knossos Meteo Station

- ☒ Air Humidity Knossos Meteo Station [auto][raw][1 hour][1 day]
- ☐ Air Pressure Knossos Meteo Station [auto][raw][1 hour][1 day]
- ☒ Air Temperature Knossos Meteo Station [auto][raw][1 hour][1 day]
- ☐ Dewpoint Knossos Meteo Station [auto][raw][1 hour][1 day]
- ☐ EvapoTranspiration Knossos Meteo Station
- ☐ Heat Index Knossos Meteo Station [auto][raw][1 hour][1 day]
- ☐ Precipitation Knossos Meteo Station [auto][raw][1 hour][1 day]
- ☐ Windchill Knossos Meteo Station [auto][raw][1 hour][1 day]
- ☐ Wind Knossos Meteo Station

Full Range 1 year 1 month 1 week 1 day ← → ↑ ↓

— Air Humidity Knossos Meteo Station
— Air Temperature Knossos Meteo Station



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



BBC ONLINE NETWORK
BBC NEWS
News in Audio News in Video Newyddion Новости Noticias أخبار 国际新闻 粵語廣播

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.

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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

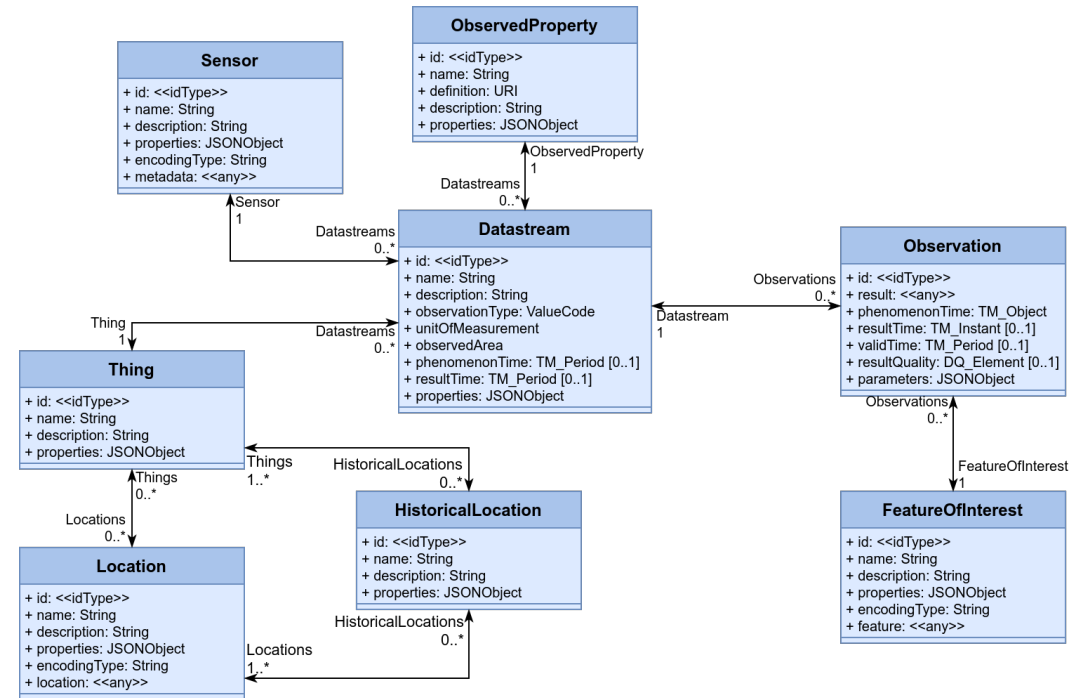
The Update

- 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

Implementations

<https://www.ogc.org/resource/products/byspec/?specid=772>

OGC SensorThings API Part 1: Sensing 1.0

Scroll to Organization:

52 North GmbH

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52N Helgoland API 3.3.3 [🔗](#)

[👤](#) Jlrka, Simon

Registered: 2016-08-10

Fraunhofer-Gesellschaft

[Top ▲](#)

FROST-Server 1.14.x [🔗](#)

[🌐](#) OGC SensorThings API Part 1: Sensing 1.0 (Certified: 2021-11-01)

[👤](#) Hylke van der Schaaf

Registered: 2016-08-10

Geodan Holding BV

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GOST 0.3 [🔗](#)

[👤](#) Bert Temme

Registered: 2016-11-28

GOST 0.6 [🔗](#)

[👤](#) Bert Temme

Registered: 2018-01-10

GOST 0.6.1 [🔗](#)

[👤](#) Bert Temme

Registered: 2020-01-28

i-bitz company limited

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Vallaris Maps 2020 [🔗](#)

[👤](#) Pongsakorn Udombua

Registered: 2021-09-06

Institute of Communication and Computer Systems (ICCS)

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SensorThings 1.0 [🔗](#)

[✅](#) OGC SensorThings API Part 1: Sensing 1.0 (Certified: 2019-06-06)

[👤](#) Fay Misichroni

Registered: 2019-05-30

NCU

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SensorThings-MongoDB 1 [🔗](#)

[👤](#) Ting, Yu Yeh

Registered: 2022-06-27

PilotGaea Technologies Co., Ltd.

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PilotGaea GIS 11.0 [🔗](#)

[👤](#) LI, Yashu

Registered: 2020-01-07

PilotGaea GIS 12.0 [🔗](#)

[👤](#) LI, Yashu

Registered: 2021-01-17

PilotGaea GIS 13.0 [🔗](#)

[👤](#) LI, Yashu

Registered: 2022-02-21

[✅](#) OGC SensorThings API Part 1: Sensing 1.0 (Certified: 2022-02-11)

SensorUp Inc.

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SensorUp SensorThings API v1.0 [🔗](#)

[👤](#) Steve Liang

Registered: 2016-02-29

SensorUp SensorThings API v1.0 [🔗](#)

[👤](#) Steve Liang

Registered: 2016-02-29

Future Work

■ Extensions for 1.1

- Result Formats
- Domain Data Models

■ Version 2.0 is being planned

- Full API over MQTT
- Better OData alignment
- Better support for complex results
- ...

Contact

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