Integrating Field Server Data to Meteorological Data

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MetBroker (Current Version)
Field Server Data Converter

- Profile.xml
- Data Converter
- Agent
- Data.xml
- Field Server database
- Other Data Sources
- MetBroker
- MetBroker Metadata
Problems

- Profile.xml is written manually (Not Controlled)
- Knowledge about each profile.xml is hard coded in data converter.
- Require restarting MetBroker to reflect updates of Metadata (hard coded)
Ontology Based MetBroker

1. Register
2. Request
3. Request metadata
4. Request data

Decision-Making Support Services
- Operational Products
- Simulation Models
- Detailed Digital Forecast

Inference Engine
Broker

MetBroker
OWL

Metadata database
Station metadata
RDF

Meteorological databases

DB Wrapper
DB Wrapper
DB Wrapper
Integrating FS Data

http://www.agmodel.org/OntDemo/pages/main.jsf

It is difficult to define relations between MetBroker.owl and FS Profile.xml!!
Start to solve Profile.xml Problem

- Profile Editor (partially done)
- FieldServer.owl (Tokyo Univ., Kyoto Univ., & NARC, ongoing)
- Define relations between FieldServer.owl and MetBroker.owl (planed)
Problems (FieldServer.owl)

- Varieties of Field Server Platforms
- Varieties of Sensor Modules
SensorML (http://vast.nsstc.uah.edu/SensorML/)

**What is it?**

SensorML provides standard models and an XML encoding for describing any process, including the process of measurement by sensors and instructions for deriving higher-level information from observations. Processes described in SensorML are discoverable and executable. All processes define their inputs, outputs, parameters, and method, as well as provide relevant metadata. SensorML models detectors and sensors as processes that convert real phenomena to data.

**What is it good for?**

**Electronic Specification Sheet**

In its simplest application, SensorML can be used to provide a standard digital means of providing specification sheets for sensor components and systems.

**Discovery of sensor, sensor systems, and processes**

SensorML is a means by which sensor systems or processes can make themselves known and discoverable. SensorML provides a rich collection of metadata that can be mined and used for discovery of sensor systems and observation processes. This metadata includes identifiers, classifiers, constraints (time, legal, and security), capabilities, characteristics, contacts, and references, in addition to inputs, outputs, parameters, and system location.

**Lineage of Observations**

SensorML can provide a complete and unambiguous description of the lineage of an observation. In other words, it can describe in detail the process by which an observation came to be .... from acquisition by one or more detectors to processing and perhaps even interpretation by an analyst. Not only can this provide a confidence level with regard to an observation, in most cases, part or all of the process could be repeated, perhaps with some improvement.

Dr. Honda (AIT) is using SOS.
SWEET (http://sweet.jpl.nasa.gov/ontology/)

Semantic Web for Earth and Environmental Terminology (SWEET)

SWEET ontologies are written in the OWL ontology language. OWL is an XML language being adopted as a standard by the W3C. SWEET ontologies can be viewed using Internet Explorer 5 (or later) or Netscape 7. More specialized OWL-specific tools are available such as SWOOP or Proteas.

Beta version of SWEET 1.1 ontologies is available here.

See our Planetary Ontologies site for sharing ontologies.

SWEET 1.0:

Ontologies revised and validated Jan 26, 2006

Earth Realm

Physical Phenomena

Physical Process

Physical Property

Physical Substance
BIX Image Broker

Problems (FieldServer.owl)

- Varieties of Field Server Platforms
- Varieties of Sensor Modules

Any Idea or Suggestion?
New Field Server Application
Updates

- MetBroker supports GPV (Grid Point Value)
- According to agreements at APAN Manila
  - Start discussion how to support SOS in MetBroker (AIT and NARC)
  - Semantic Mediawiki for Field Server is up
    But...