



Finnish Open Data Portal for Meteorological Data

14th Workshop on meteorological operational systems

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Example of Data Sets -- Observations

Data set	Description	Time Interval	Estimated publish date
Weather Observations	Temperature, Wind, Humidity, Ground Temperature...	10 min	Open
Sun Radiation	UV, Short and Long Term Radiation...	1 min	Open
Marine Observations	Waves, Sea Temperature, Sea Level...	1 h	Open
Weather Radars	Precipitation Rate, Precipitation Amount...	5 min	Open
Lightning	Thunder Strikes in Finland	5 min	Open
Soundings	Temperature, Humidity, Pressure, Wind from ground to 25 km height	2 times a day	2014



Example of Data Sets - Time Series

Data set	Description	Time Interval	Estimated publish date
Real Time Observations	Real Time Observations from specific location(s)	AWS 2010 – Soundings 1959 – Flashes 1998 – Sea Level 1971 – Waves 2005 –	Open <i>older data will be added</i>
Climatological Observations	Dayly and monthly temperature mean and extreme values from weather stations	1959 -	Open
Climatological Observations	Monthly temperature and precipitation rate mean values interpolated to grid	1961 -	Open
Climatological Reference	Climatological Reference. Temperature, humidity, pressure, precipitation amount and snow depth.	Reference seasons: 1971-2000 1981-2010	2014



Example of Data Sets - Forecast Models

Data set	Description	Time Interval	Estimated publish date
Weather forecast model HIRLAM RCR	Point forecasts and grid data	Latest model run (4 times a day) 0... 54 h	Open
Sea forecast models	Sea level point forecasts, Wave (WAM), current (HBM) and ice forecast models as grid data	Latest model run (4 times a day) 0...54 h	Open

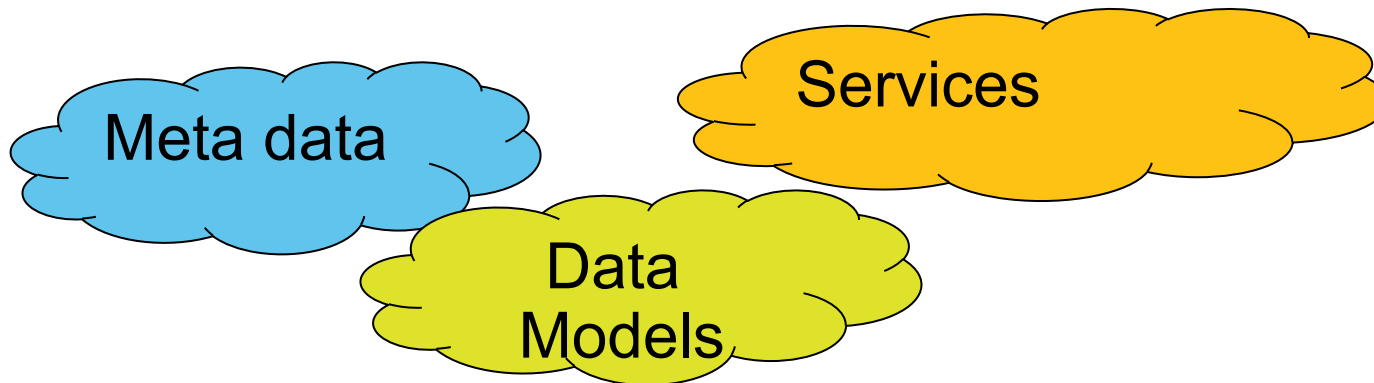
Other

Data set	Description	Estimated publish date
Environmental Monitoring Facilities	Weather observation stations, radars...	2014



Open Data Portal

FMI Open Data Portal follows INSPIRE requirements.



- Data is provided in INSPIRE compliant form
 - GML
 - O&M guideline is honored

(Inspire = Infrastructure for Spatial Information in the European Community)



Services

- **Catalog Service (CSW = Catalog Service for Web)** for meta data
- **View Service (WMS = Web Map Service)** for exploring the data
- **Download Service (WFS = Web Feature Service)** for downloading the data in GML (Geography Markup Language), Grib, NetCDF or GeoTiff depending on the nature of the data



Catalog Service

- Provides both user interface and API to search data
- Very high level meta data
 - Observation stations, forecast model
 - Temporal coverage (start and end times)
 - Spatial coverage
- Runs on GeoNetworks

<http://catalog.fmi.fi/>

The screenshot displays the FMI catalog web interface. The header includes the FMI logo and navigation links. The main content area is divided into two columns. The left column contains search filters for 'WHAT?' and 'WHERE?'. The right column shows a search result for 'Säähavaintien vuorokausiannot: Utajoki Kevo Keväätä'. The result details include identification information, presentation form, and point of contact.

Identification info		
Title	Säähavaintien vuorokausiannot: Utajoki Kevo Keväätä	
Date	2013-03-21	
Date type	Creation: Date identifies when the resource was brought into existence	
Date	2013-03-22	
Date type	Publication: Date identifies when the resource was issued	
Date	2013-05-29	
Date type	Revision: Date identifies when the resource was examined or re-examined and improved or amended	
Date type	gmd:RS_identifiable_Type	
Code	obs_point_daily126727	
Codespace	http://kml.fmi.fi/Identifier/codeSpace/INSPIREdataaet	
Presentation form	Digital document: Digital representation of a primarily textual item (can contain illustrations also)	
Abstract	Aluekoodeksi Ilmatieteen laitoksen säähavaintien lausunnossa ja mittauksissa vuorokausiannot. Lausunnossa arvot ovat ilman lämpötilan vuorokausiannoin ja säätilan vuorokausiannoin. Mittauksissa arvot ovat ilman lämpötilan ja maksimimittauksia, maanpinnan minimilämpötila ja suhteellinen kosteus. Ilman lämpötilan mittaukset tehdään 05 ja 19 UTC ja maanpinnan minimilämpötila 06 UTC. Nämä kuvaavat säätilan edelleen 12 tunnin (klo 15-06 ja 06-15 UTC) jakson ajalta.	
Point of contact		
Organisation name	Ilmatieteen laitos	Yhteisö
Responsible Party	Party that accepts accountability and responsibility for the data and ensures appropriate care and maintenance of the resource	City
		Country
		Postal code
		Electronic mail address
		OnLine resource



View Service

- Web Map Service (WMS)
- The most common used data published as layers
 - Observations
 - Temperature, Wind, Pressure, Humidity, Visibility
 - Forecasts
 - Grid data as color areas
 - Contour lines hard to produce with GeoServer
 - Radar images
 - Scanning angle as elevation dimension
 - Around 7 days history



Download Service

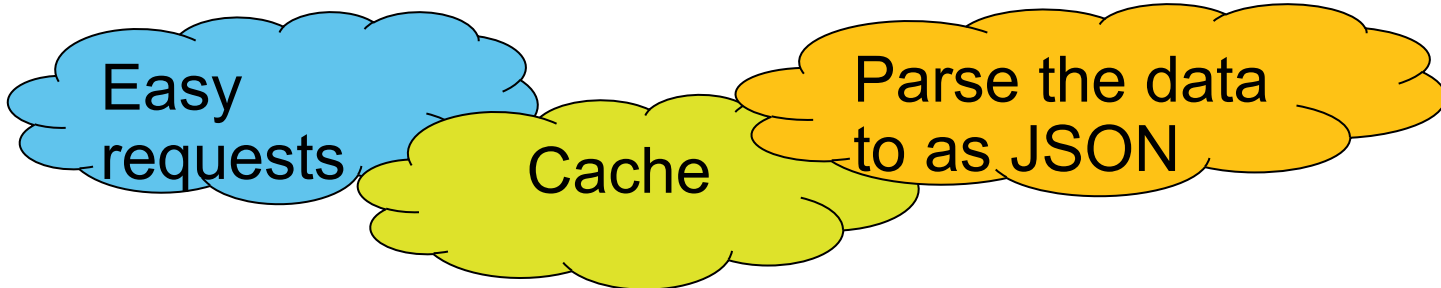
- Web Feature Service (WFS) 2.0 Simple Profile
- Based on stored queries
 - Predefined data sets with possibility for additional parameters (i.e. time and area)
- Provides data as GML (Geography Markup Language)
 - Grid data in an appropriate form (Grib, NetCDF or GeoTIFF) as a reference
- In-house production

<http://en.ilmatieteenlaitos.fi/open-data-manual-fmi-wfs-services>



MetoLib

- Open source JavaScript library produced by Finnish Meteorological Institute
- Helps users to load and use the data



- Supports multipoint coverage data format
- Python version is on the list

Please contribute!

<https://github.com/fmidev/>



Registration

- Registration is required to use View and Download Services
 - Working email address is the only mandatory information
- After registration the user gets an API key which have to be added into all requests
 - POST field *fmi-apikey=...*
 - GET parameter *fmi-apikey=...&*
 - Header *fmi-apikey; ...*
 - Part of url *http://wms.fmi.fi/fmi-apikey/.../wms?*
- One can create several API keys with one email



Usage limits

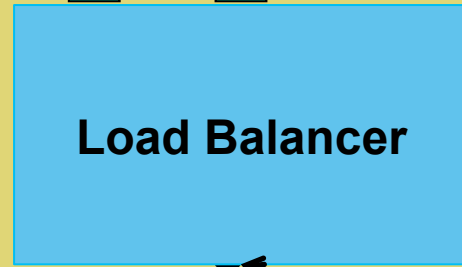
With one API key it's allowed to

- do at most 20 000 requests per day to Download Service
- do at most 10 000 requests per day to View Service
- do at most 600 requests per 5 minutes to both services

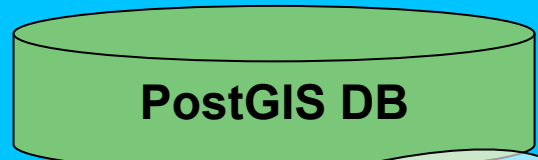
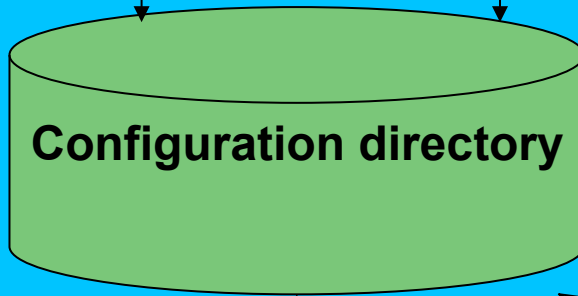
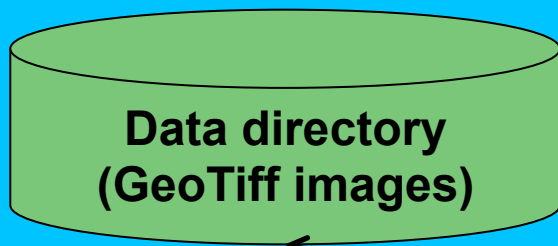
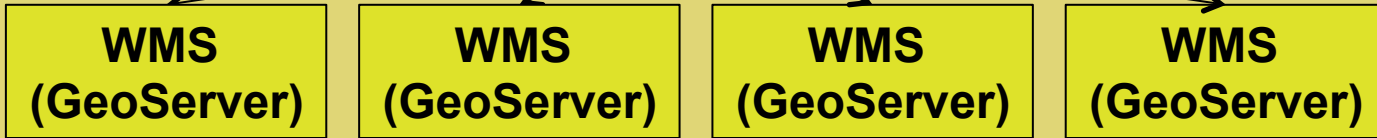
- Little over 17 000 new data sets are published daily
 - So, with one API key it's allowed load everything once
- View service can be used for testing but can not be used as a back end for popular clients



DMZ



No GeoWebCache
–
load balancer
works as a cache



NFS for data and
configuration

Intranet



DMZ

Authentication

Authentication

Load Balancer

Log

Log

WMS
(GeoServer)

WMS
(GeoServer)

Frontend

Frontend

Catalog
(GeoNetwork)

Backend
(binary data)

Backend
(binary data)

Backend
(WFS)

Backend
(WFS)

NFS
(Forecast data, radar images)

DB
(Observations)

Intranet



DMZ

Authentication

Authentication

Load Balancer

Log

Log

Private

Open Data

NFS

(Forecast data, radar images)

DB

(Observations)

Intranet



Some experiences

- Quite many expected a user interface to load data to i.e. to Excel instead of machine readable interface
- Finally we have all the data behind one access point behind standard interfaces and in harmonized formats
- So far maybe even more professional interest than private
- Radar images, observations and point forecasts are the most interesting.
 - For now, very few have been interested in forecast models as a grid data.
- 3000 registered users so far



FMI DATA

<http://en.ilmatieteenlaitos.fi/open-data-manual>

