ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

Finnish Open Data Portal for Meteorological Data

14th Workshop on meteorological operational systems

Roope Tervo

Finnish Meteorological Institute

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 *older data will be added*
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

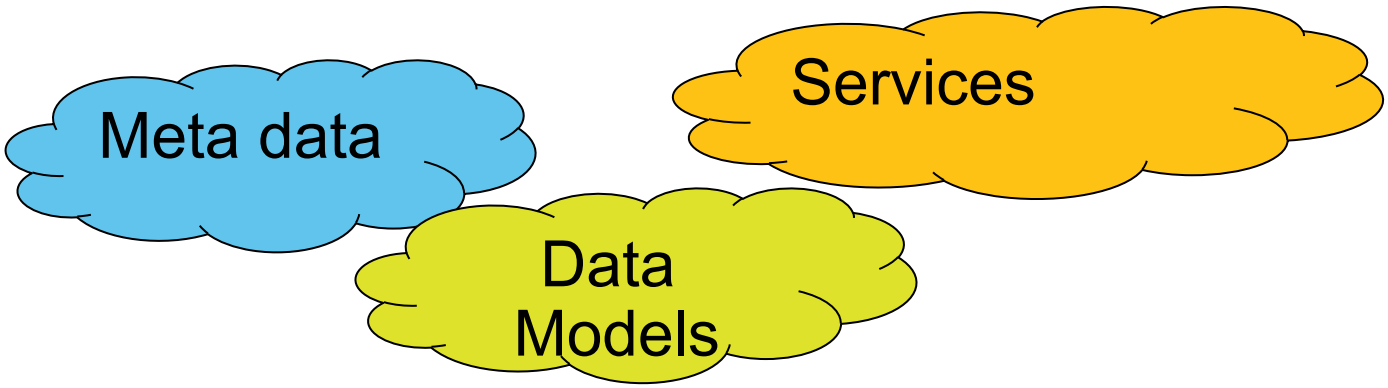
Data set	Description	Time Interval	Estimated publish date
Weather forecast model HIRLAM RCR	Point forecasts and grid data	Latest model run (4 times a day) 0… 54 h	Open
Sea forecast models	Sea level point forecasts, Wave (WAM), current (HBM) and ice forecast models as grid data	Latest model run (4 times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

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

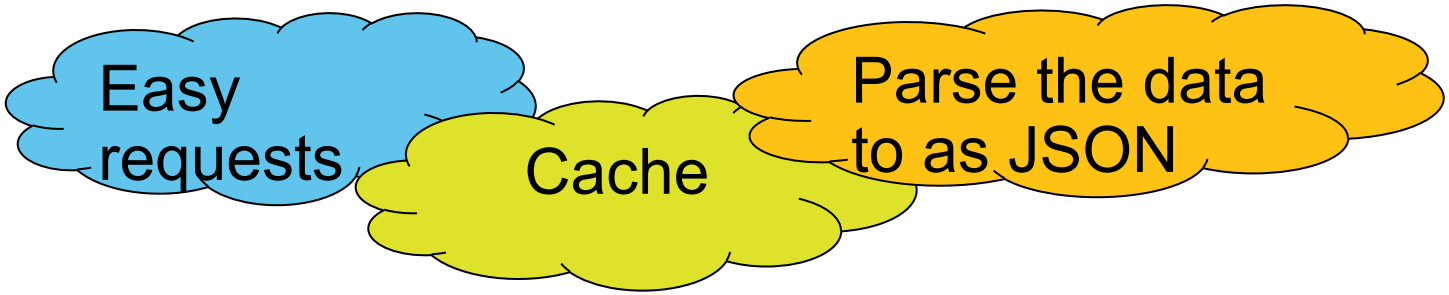
Download Service

- 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

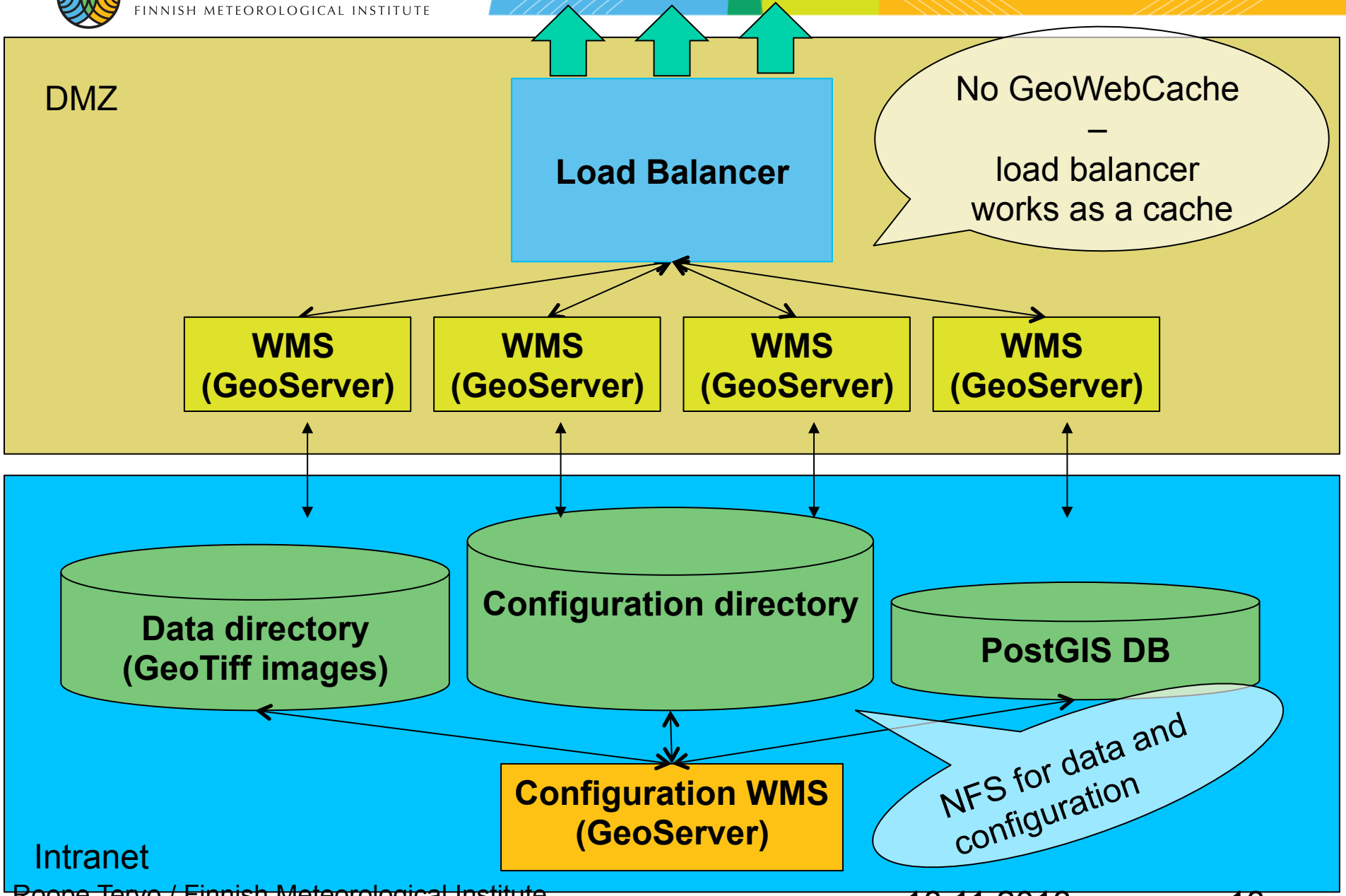
- Registration is required to use View and Download Services
  - Working email address is the only mandatory information
- After registration the user gets an API key which have to be added into all requests
  - POST field *fmi-apikey=…*
  - GET parameter *fmi-apikey=…&*
  - Header *fmi-apikey; …*
 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

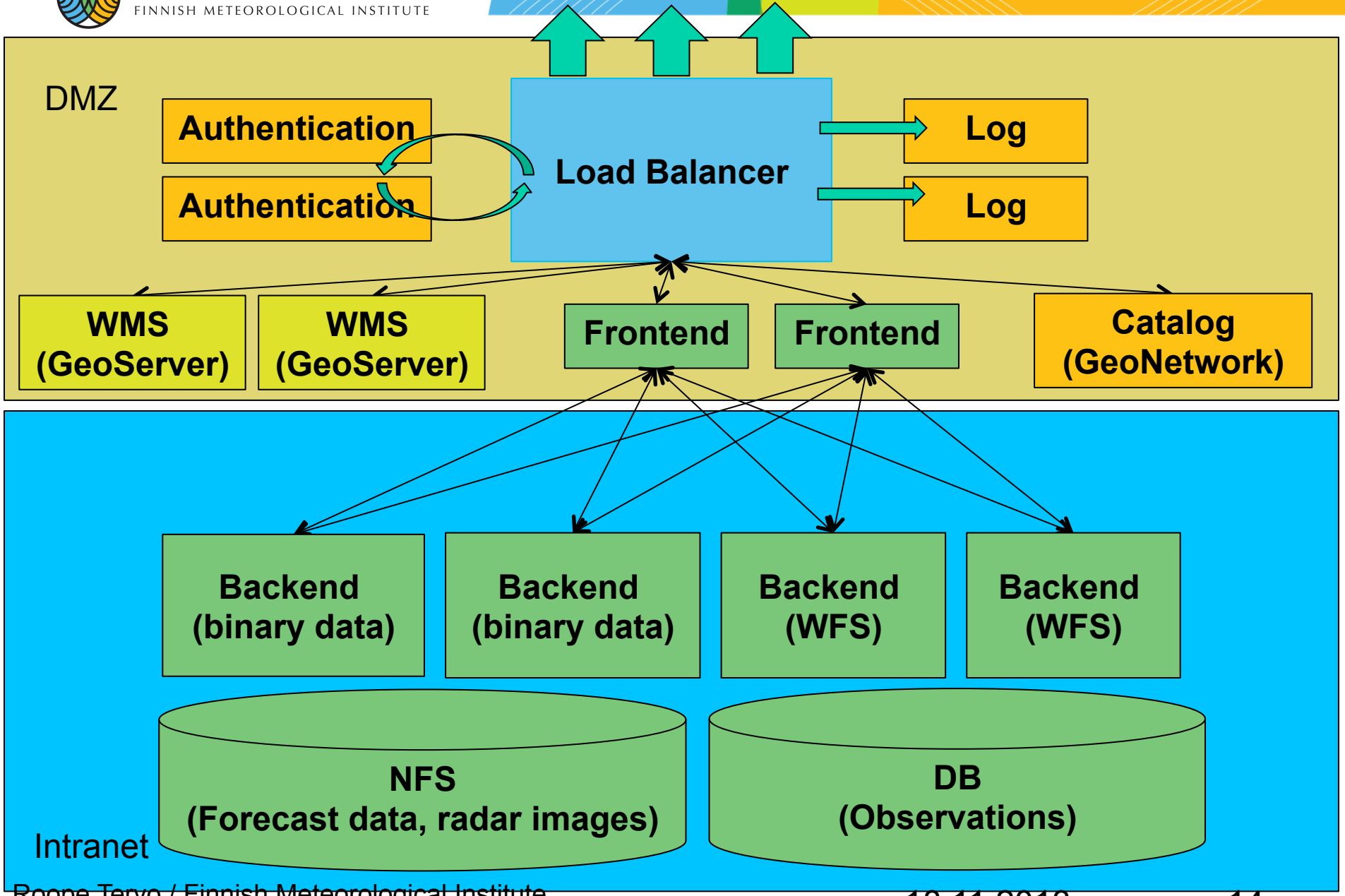
Usage limits

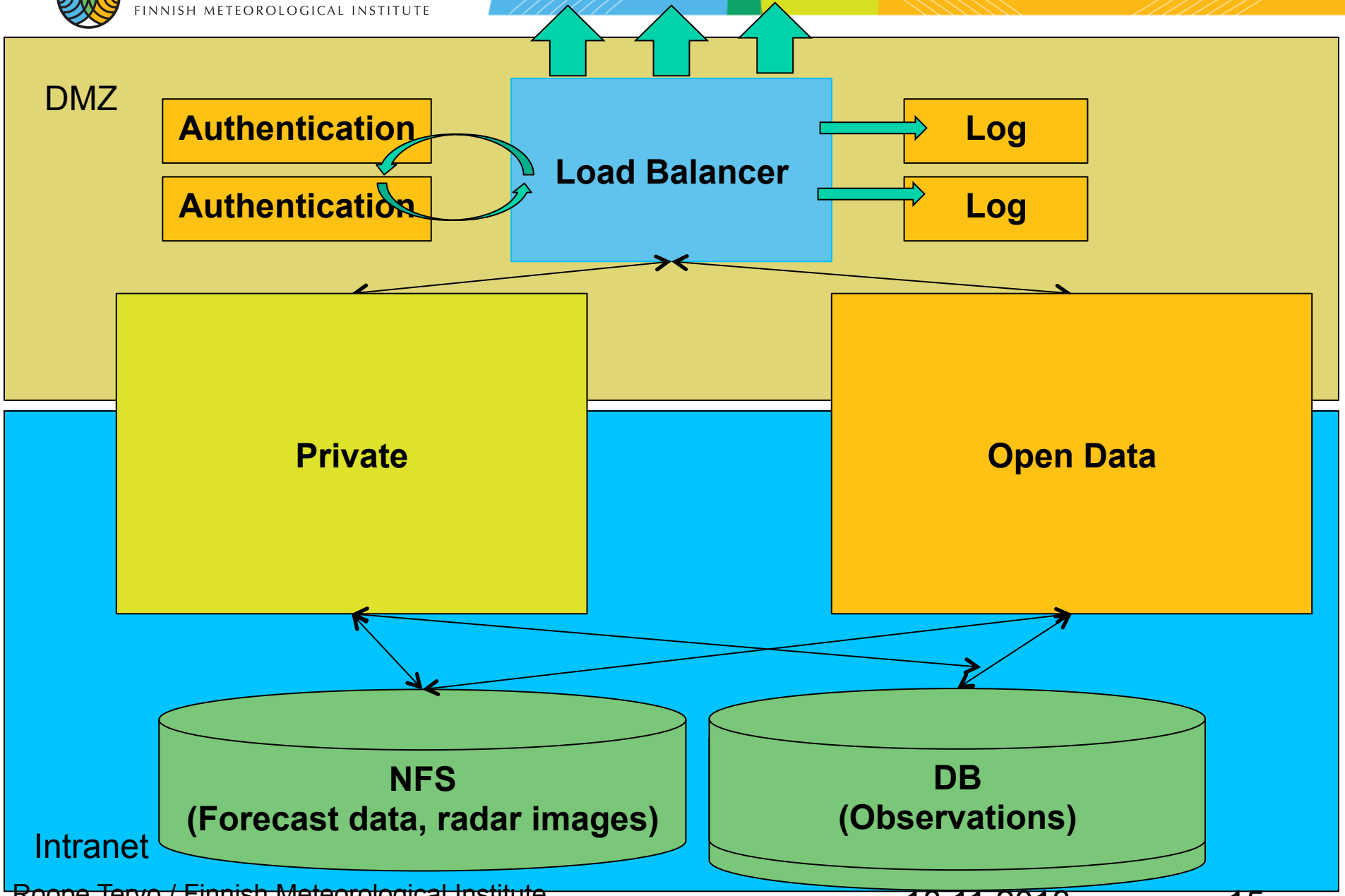
With one API key it's allowed to

- 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
Load Balancer
No GeoWebCache
–
load balancer
works as a cache
WMS
(GeoServer)
WMS
(GeoServer)
WMS
(GeoServer)
WMS
(GeoServer)
Data directory
(GeoTiff images)
Configuration directory
PostGIS DB
Configuration WMS
(GeoServer)
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 OPEN DATA

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