SMHI

New observations archive at SMHI

12th Workshop on Meteorological Operational Systems

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SMHI

Outline

- Background
- Architecture
- Technology
- Challenges

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Background

- The main climate archive at SMHI needs to be replaced
  - Build in the early 80'ies before SQL was invented
  - Staff about to retire
  - "Closed system"
  - Runs on Alpha/OpenVMS
  - Mimer database

- Demand for new products on the web

- Lots of work in the old system to provide data to the research community

- Poor metadata and consistency control in the old archive

Outline

- Background
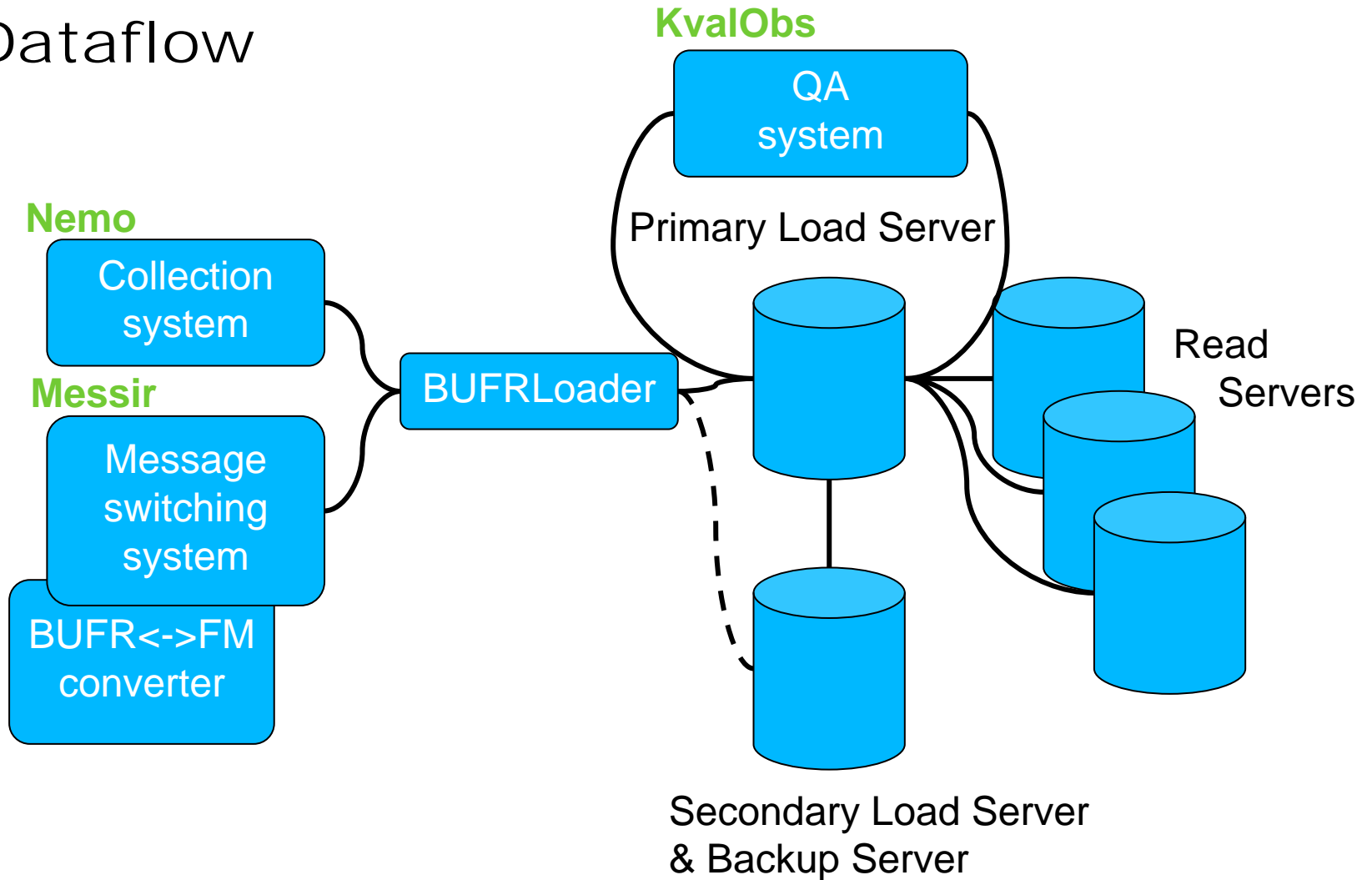- Architecture
- Technology
- Challenges

Design goals

- Open, easy to use and platform independent interfaces

- Low cost hardware and software

- Prevent "data erosion"

- Long life time
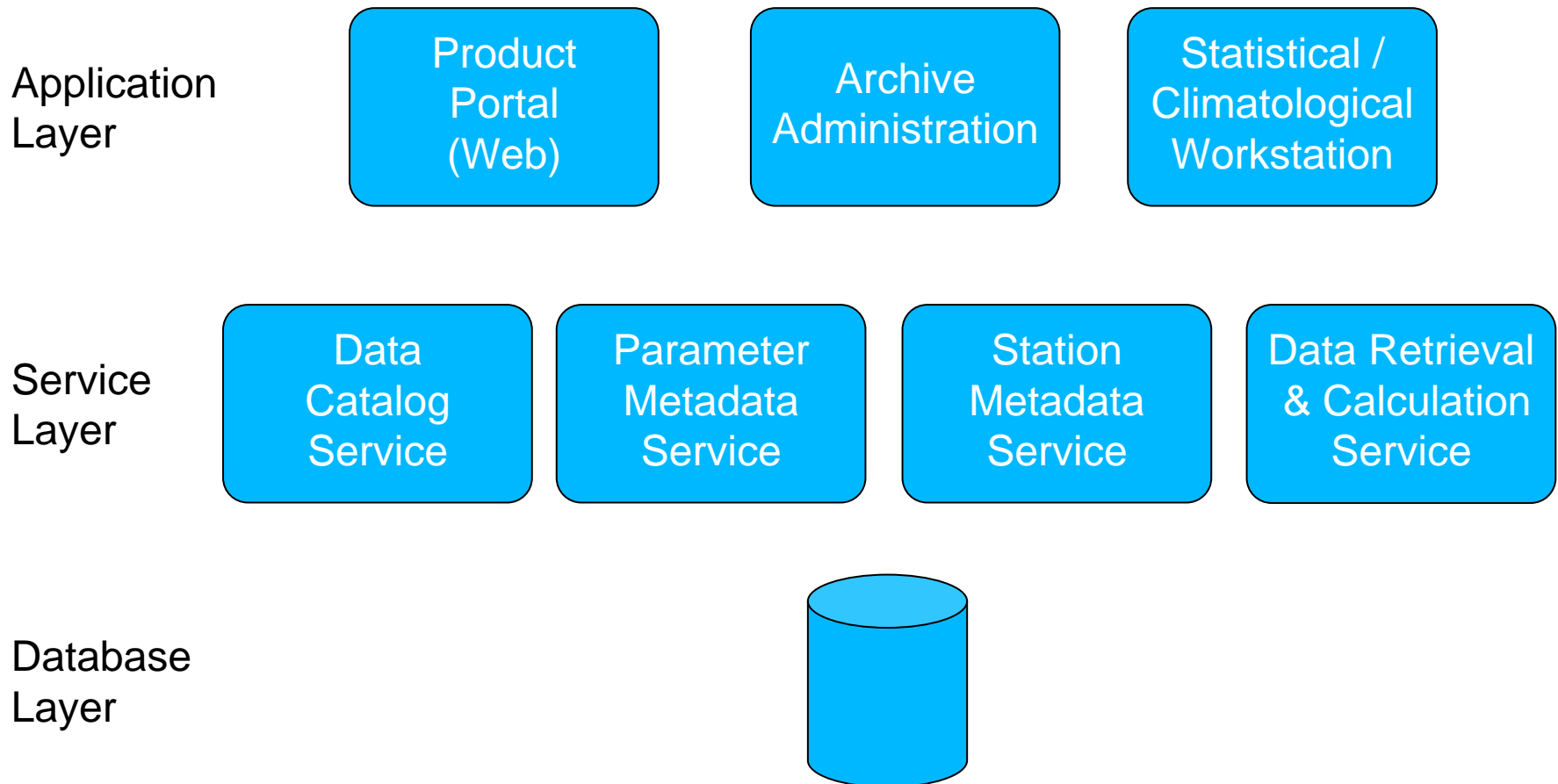
- Thin client / web based client

Design principals

- Store data in a relational database

- Normalized database design

- Precise description of dimensions like time, altitude, physical phenomena…

- Referential consistency

- Comprehensive metadata

- Platform independent software

- Use of standards
    - ISO 191 15/39
    - OGC web services

Dataflow

KvalObs

QA system

Nemo

Collection system

Messir

Message switching system

BUFR<->FM converter

BUFRLoader

Primary Load Server

Read Servers

Secondary Load Server & Backup Server

Service Oriented Architecture

Application
Layer

| Product Portal (Web) | Archive Administration | Statistical / Climatological Workstation |

Service
Layer

| Data Catalog Service | Parameter Metadata Service | Station Metadata Service | Data Retrieval & Calculation Service |

Database
Layer

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Technology

- Database
    - Postgres database
    - Postgis geospatial extension
    - Redhat Linux on HP Intel EM64T based blade servers
    - Disk on Hitachi AMS SAN
        - (SSD under investigation/testing)
- Applications
    - JBoss application server (Java)
    - Redhat Linux on HP Intel EM64T based blade servers
    - EJB3
    - REST and SOAP web services
   - Geoserver, Geowebcache and Geonetworks

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Data migration

- Strategy
    - Store the observed value and the "best value"

- Challenges
    - Several old archives
    - Unclear quality of data in some of the archives
    - Some data missing meta data
    - Duplicated information
        - How do you find the "best value" for a given time?

- Result
    - A set of migrations "rules" for each parameter to be migrated
    - Consolidated metadata catalogue for all the old archives.
    - BUFR Generator to generate intermediate BUFR files

BUFR

New
Archive
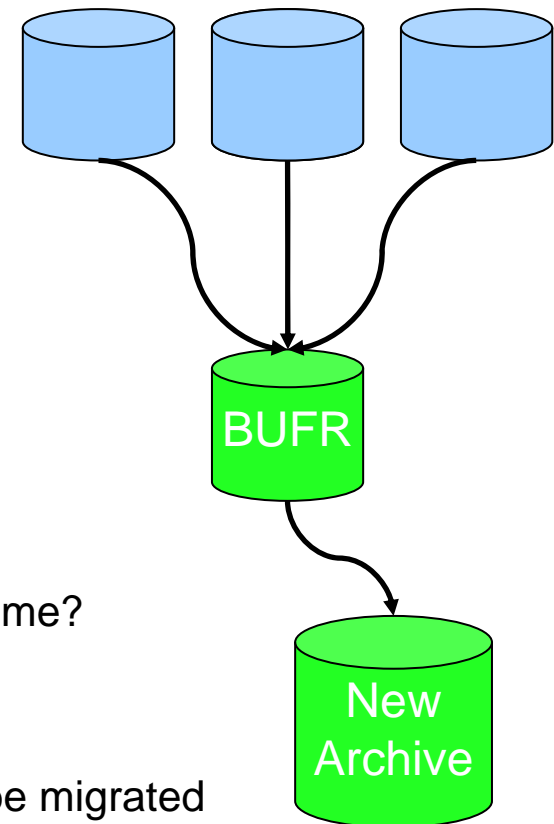
Future challenges

- Replace the real time database

- Public web services for researchers

- Increased reporting frequency

- Storing precomputed aggregates