Vaisala Pilot Implementation in Kokkola

Ubicasting presentation 2008-09-10

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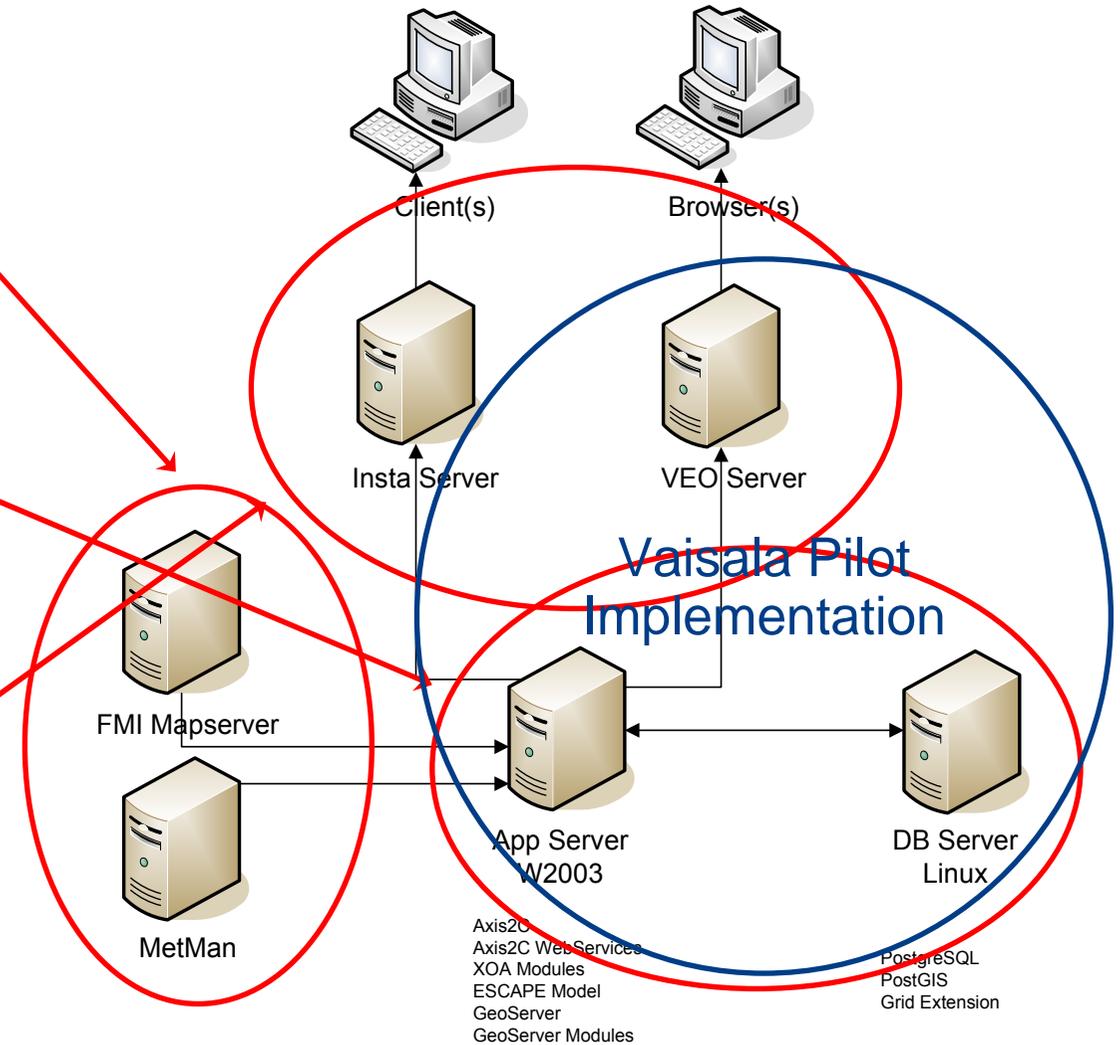
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Project Goals – Long term

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  - Create framework for Observation Engine (OE), Refining Engine (RE), Delivery Engine (DE)
    - OE – Weather data management
    - RE – 3rd party weather models – ESCAPE
    - DE – Web-based weather data user interface – VEO
  - Define and use standard interfaces between related systems
  - Re-use existing software product platform
  - Integrate project results into the software product platform
    - Upcoming software products should be able to utilize the new functionalities

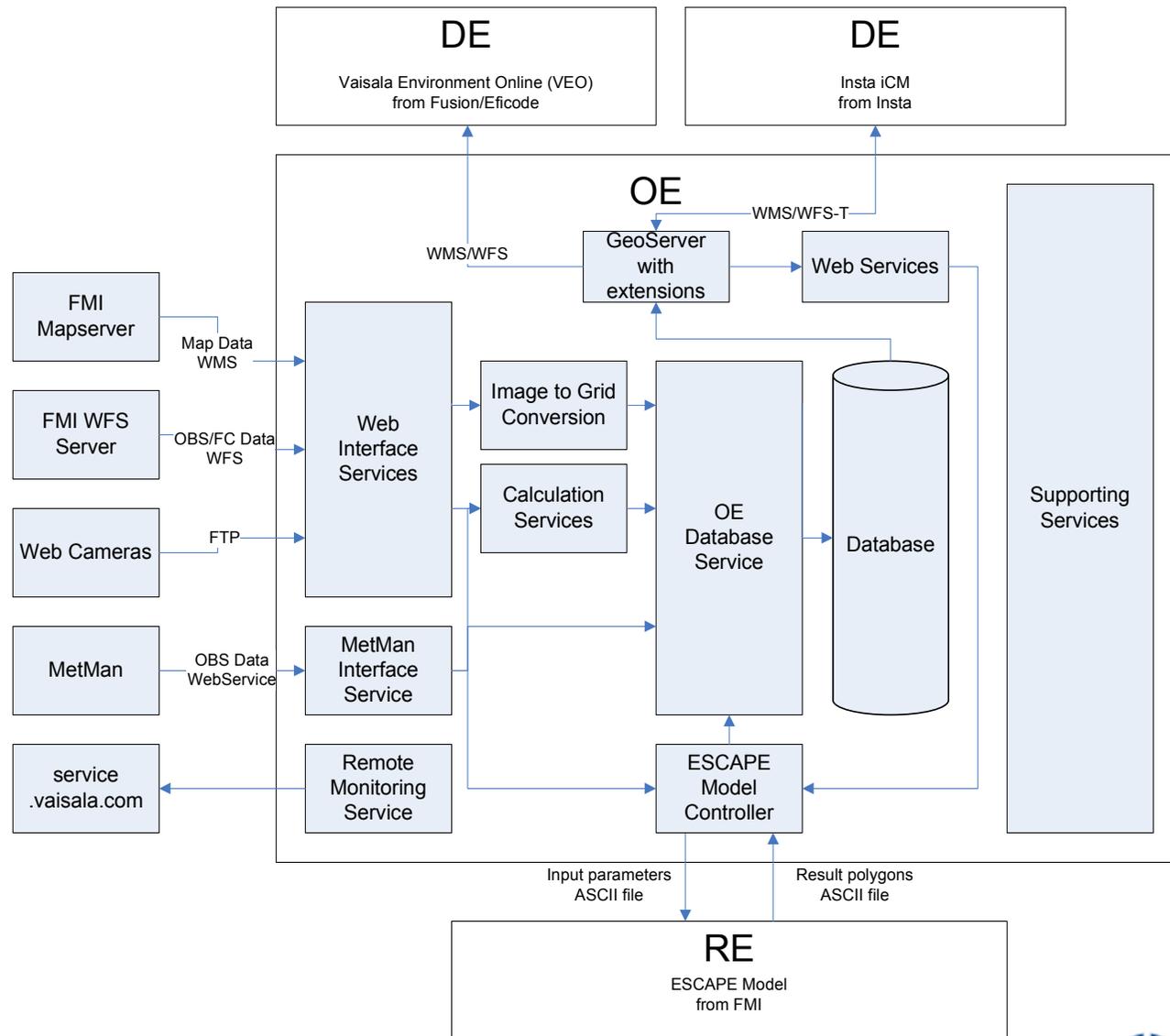**VAISALA**

Project Goals – Short term

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  - Store, manage and serve quality controlled weather data
    - Point and gridded data
    - Weather camera and radar images
    - Observation and forecast data
    - Strongly typed and georeferenced data
  - Execute ESCAPE dispersion model provided by FMI
    - Calculate needed model parameters
    - Format input data file for ESCAPE
    - Read back ESCAPE results file
  - Use Open Geospatial Consortium (OGC) standards
    - Retrieval/serving of grids and maps using WMS
    - Retrieval/serving of observations and GIS features using WFS
    - Support insertion of dispersion events using WFS-T, trigger ESCAPE model run for the event, and return resulting GIS features by WFS
  - Create a pilot of web-based weather data user interface
    - Web-portal capable of viewing observations, forecasts, radar images, weather camera images, GIS maps and features

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Pilot Implementation – Server Structure

- **Observation and forecast data providers**
  - MetMan server (from existing Testbed system)
  - FMI Mapserver

- **Data management and ESCAPE model in**
  - App Server
  - DB Server

- **Client systems with UI:s**
  - Insta Server
  - VEO Server

Client(s)

Browser(s)

Insta Server

VEO Server

Vaisala Pilot Implementation

FMI Mapserver

MetMan

App Server W2003

DB Server Linux

Axis2C
Axis2C WebServices
XOA Modules
ESCAPE Model
GeoServer
GeoServer Modules

PostgreSQL
PostGIS
Grid Extension

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Pilot Implementation – Software Structure

Results and Conclusions

- Results and Conclusions
  - Extended existing software product platform with new functionalities
    - Created functional implementations of OGC standards (WMS, WFS-T, WCS) and web-services based on open-source components.
      - *OGC standards and Web-services are important technologies for Vaisala especially in integrating georeferenced data.*
    - Added georeferenced data handling functionality.
  - Created a new kind of observation/forecast database
    - Handles images, observations, forecasts and GIS features.
      - *The database development continues to support even more advanced datasets.*
    - Extendable data types with strongly typed and named data.
    - Efficient gridded data handling.
    - Studied ways for efficient handling of long time-series data in databases.
  - Implemented a mechanism to execute small 3rd party weather models.
    - *The framework makes the model integration easier and more efficient.*
  - Created a new pilot implementation of generic web-based weather data user interface – VEO
    - *Modern web-technologies enable highly interactive and asynchronous UI development.*