The ANKA Archiving System

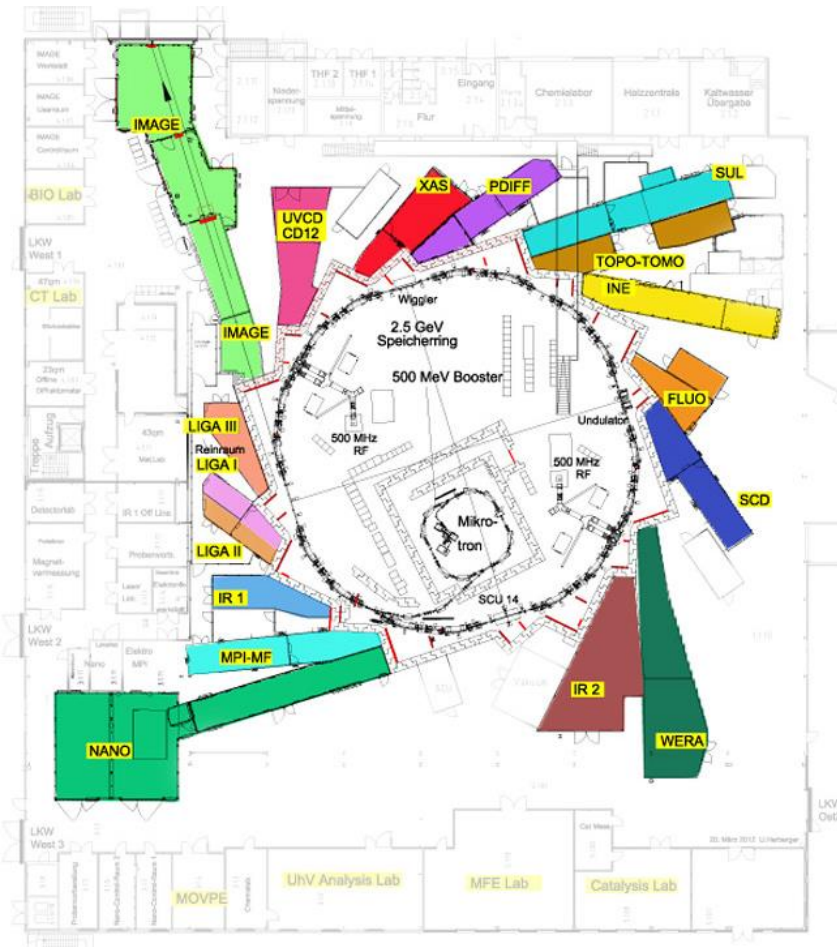**Combining Tango, WinCC OA and the web front-end ADEI**

David Haas, ANKA Synchrotron light source

Content

- ANKA – Synchrotron light source
- Data structure at ANKA
- Aims of the ANKA Archiving System
- Which tools are available?
- Project / Archiving System parts
    - The Tango Archiving System (Mambo)
    - WinCC OA Plugin for MySQL
    - ADEI (Advanced Data Extraction Infrastructure)
- Connecting things together
- Demonstration (Web front-end)
- Outlook and summary

ANKA – Synchrotron light source

- ANKA at KIT
- First light 2000
- research methods
    - Fluorescence
    - Scattering
    - Spectroscopy
    - Lithography
    - Imaging
    - Synchrotron research

Technical data of the storage ring

- Storage ring diameter 35m
- Energy 2.5 GeV
- Current up to 400 mA
- 21 Beamlines

Data structure at ANKA

- 2 Main control systems producing data
  - WinCC OA → Beamline control, e.g. vacuum, temperature control
  - Tango → experimental control, e.g. motors, camera control

- Existing interesting analog data points
  - WinCC OA approx 175 data points / beamline
  - Tango approx 100 data points / beamline

- This leads to approx **5500** data points at whole ANKA (20 Beamlines)

Aims of the ANKA Archiving System

- Logging of most important data (beamline and experimental)
    - Data is produced by 2 main control systems: Tango and WinCC OA

- Easy to configure and flexible logging setup

- Fast access to the data (showing data instantly)

- State of the art and convenient web front-end representing logged data
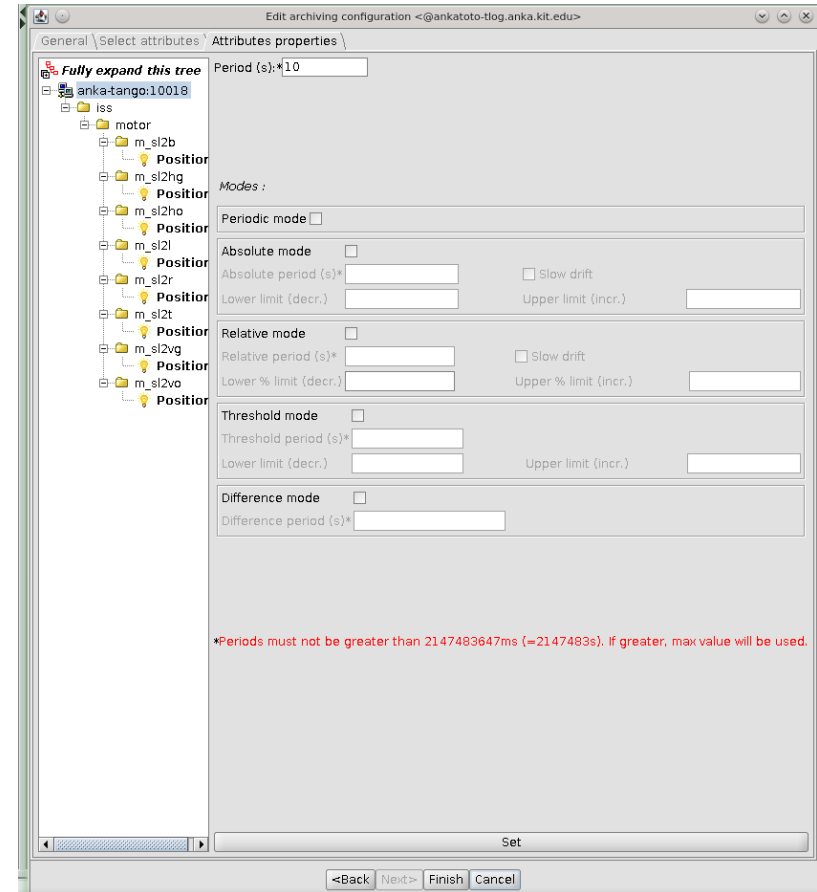
Which tools are available

- Tango Archiving System
  - Powerful and well working Archiving for Tango
  - No web interface available
  - For large data sets slow data access
- WinCC OA
  - Proprietary logging function available → but no public database
  - Need to develop a tool to redirect data in MySQL db
- ADEI (Advanced Data Extraction Infrastructure)
  - State of the art web front-end for the common databases like MySQL
  - Fast data access

**CHALLANGE: Bringing together
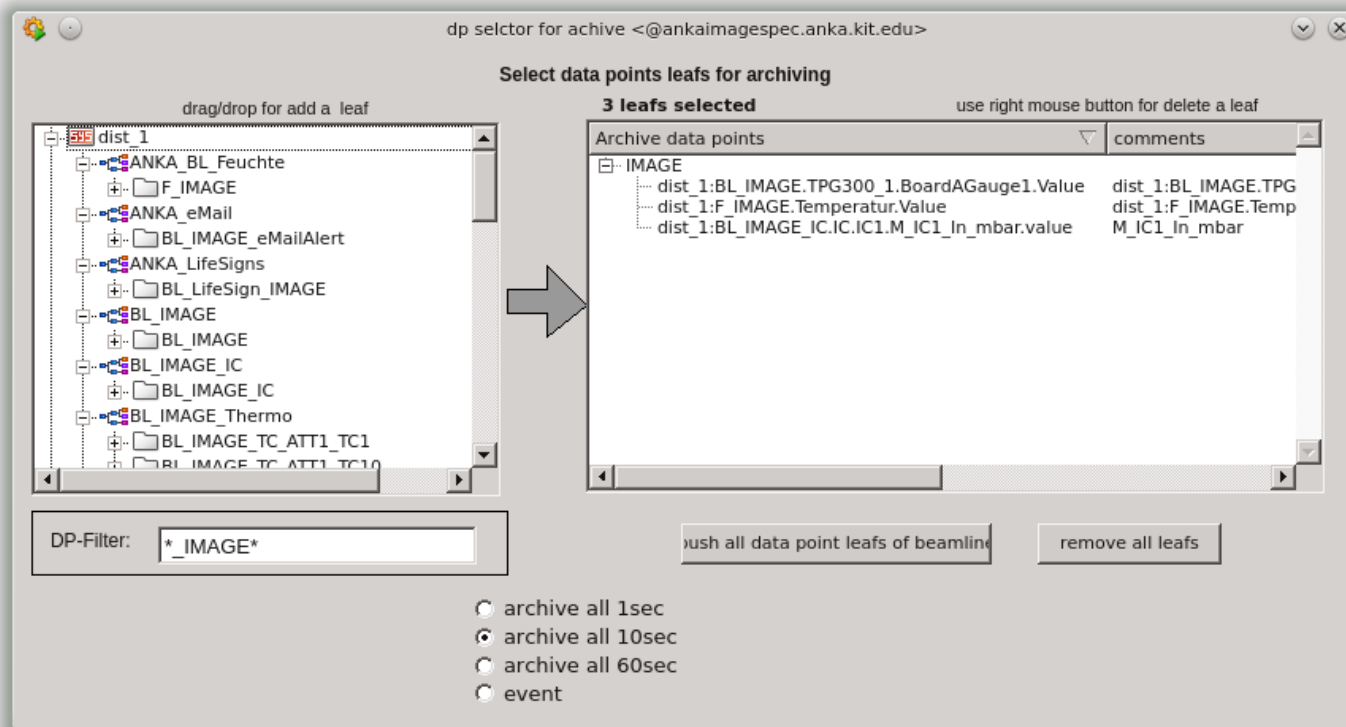Tango Archiving System, WinCC OA and ADEI**

The Tango Archiving System (Mambo)

- Efficient and powerful archiving mechanism

- Used and maintained by our community

- Mambo has an easy configuration user interface
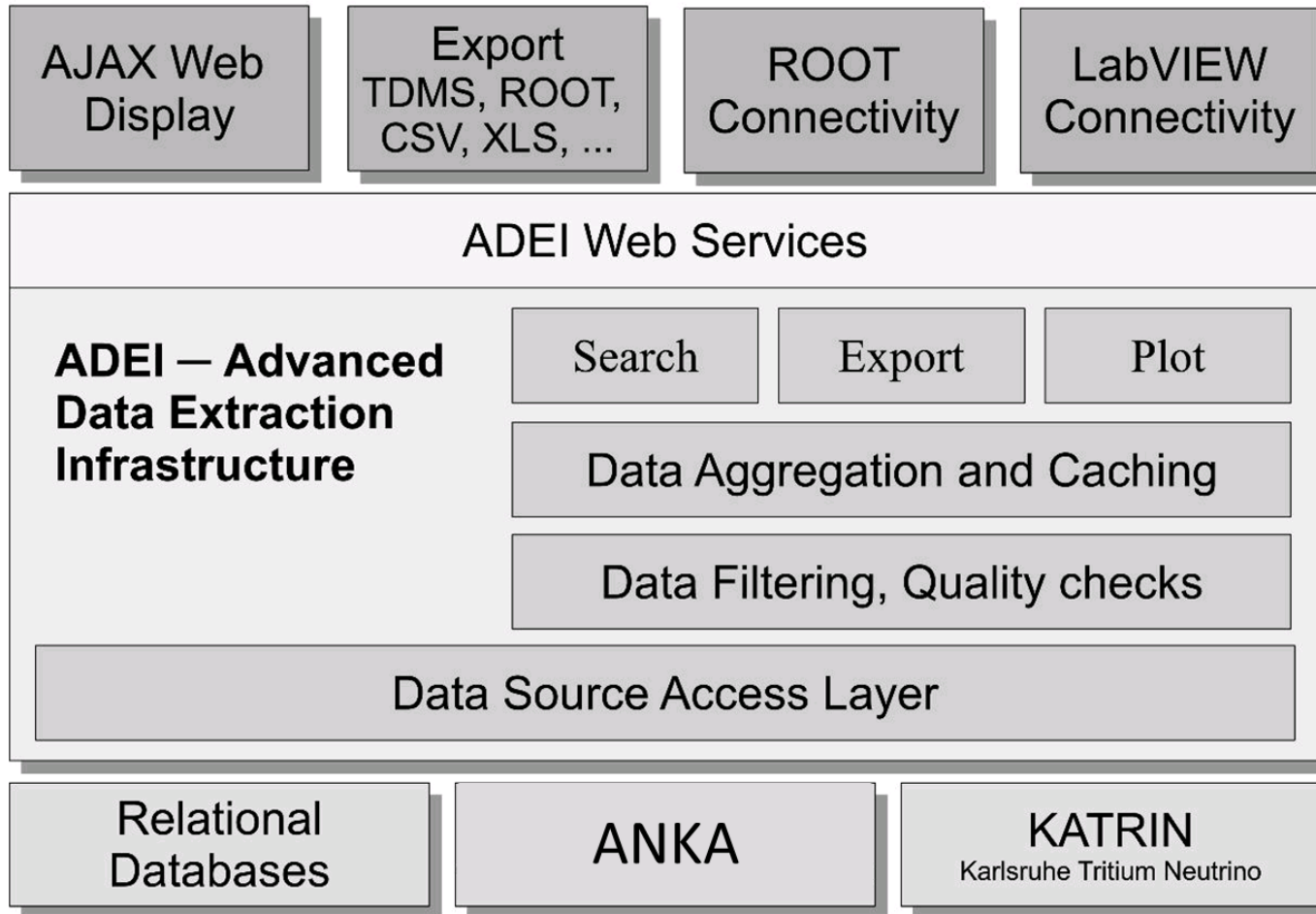
- ANKA Using MySQL database

WinCC OA (PVSS) Archiver Plugin

- Works as a counterpart to Mambo for WinCC OA
- Easy GUI to configure logging of values in WinCC OA
- Allows different modes of logging periods
- Saves into a MySQL database

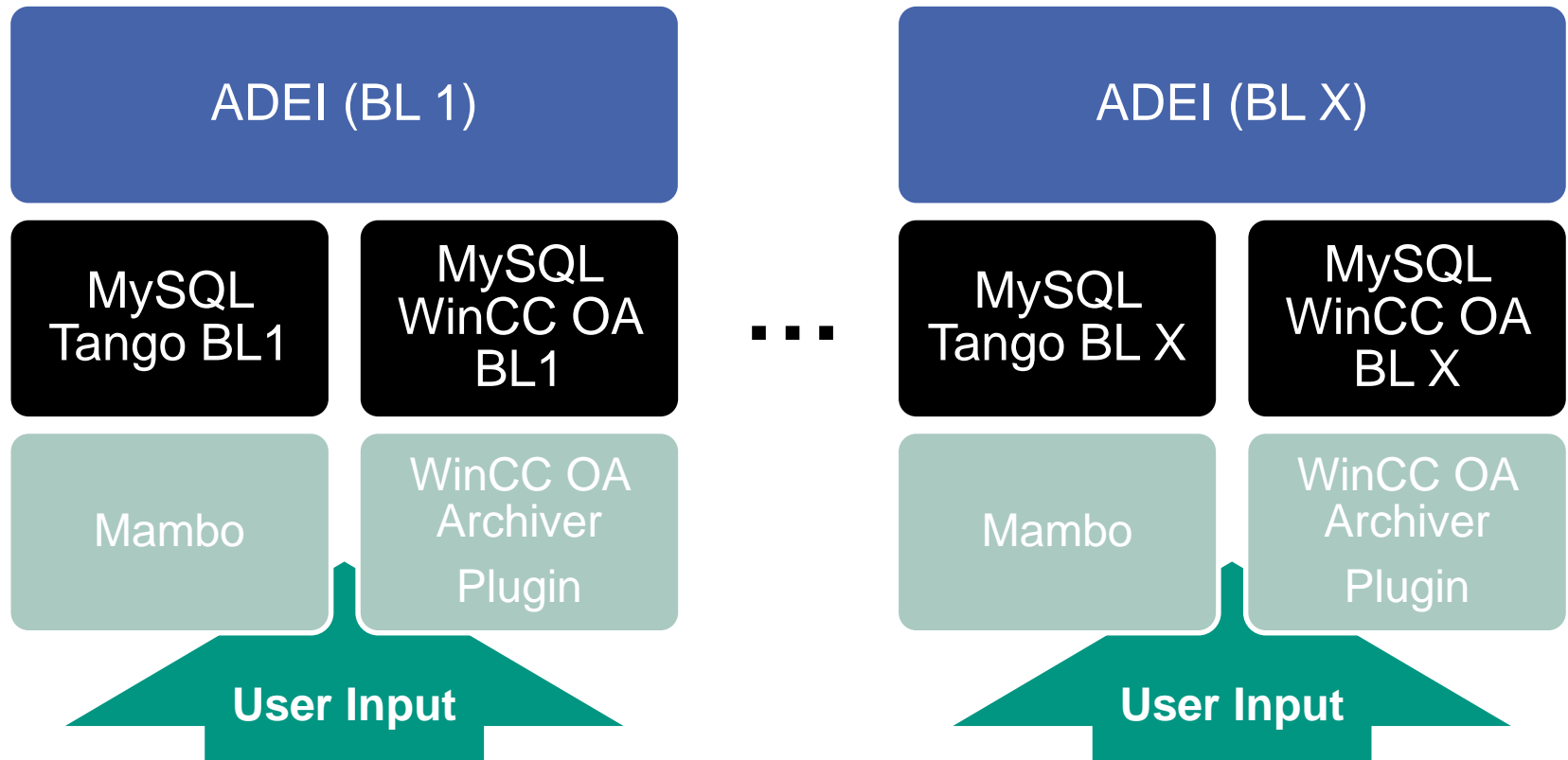# ADEI (Advanced Data Extraction Infrastructure)

Applications

- AJAX Web Display
- Export TDMS, ROOT, CSV, XLS, ...
- ROOT Connectivity
- LabVIEW Connectivity

ADEI Web Services

ADEI – Advanced Data Extraction Infrastructure

- Search
- Export
- Plot
- Data Aggregation and Caching
- Data Filtering, Quality checks
- Data Source Access Layer

Data Sources

- Relational Databases
- ANKA
- KATRIN — Karlsruhe Tritium Neutrino

ADEI (Advanced Data Extraction Infrastructure)

- Developed for long-running physical experiments dealing with time series data

- State of the art Web front-end

- Fast Data acces
  - Precaching data (storing data in a different time-cache database)
  - Loading of data points relies to the display resolution

- Modular system with features like fast access, filtering, QA etc

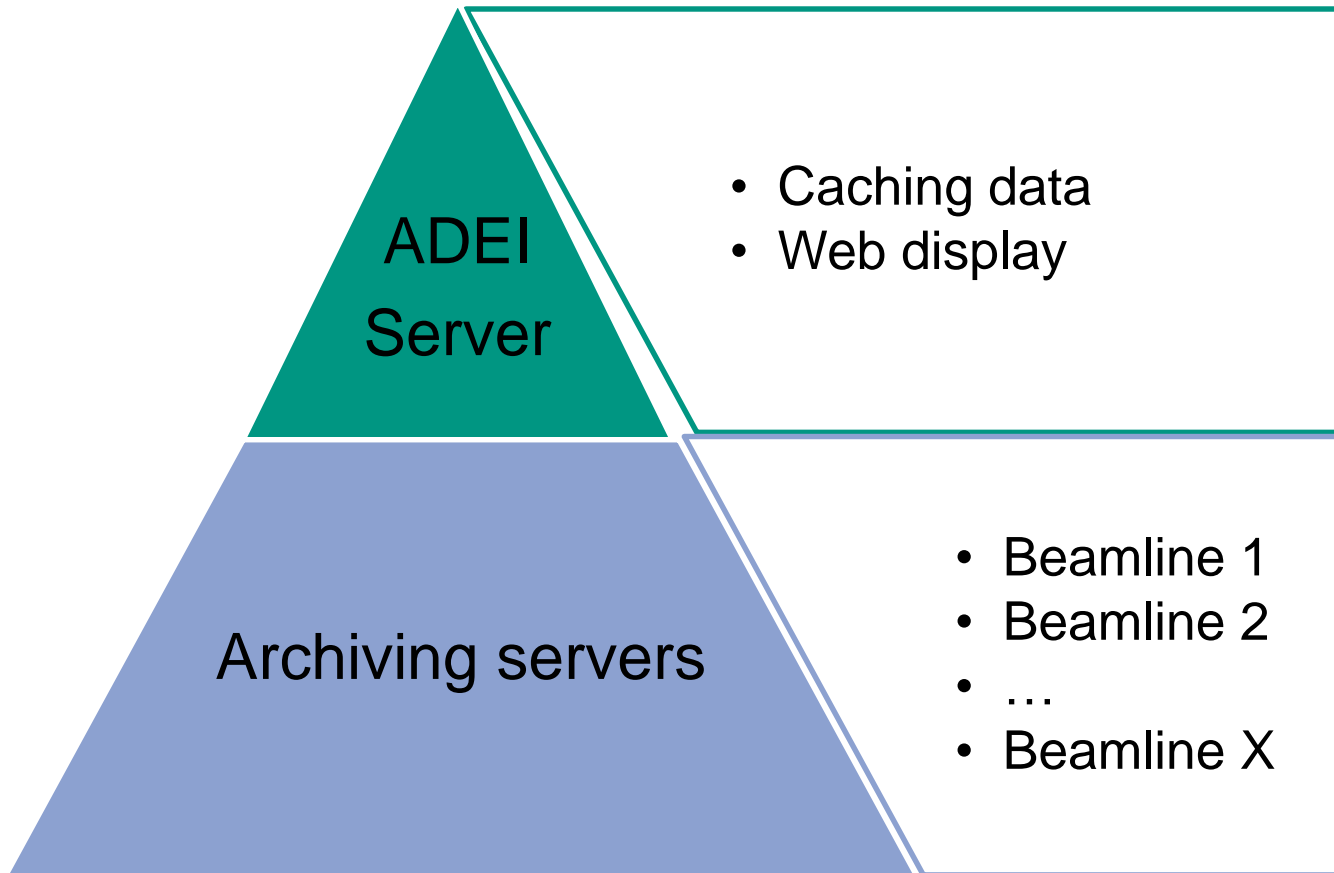- Configurable for different data sources

Connecting things together

Software structure

ADEI (BL 1)

MySQL Tango BL1

MySQL WinCC OA BL1

Mambo

WinCC OA Archiver Plugin

User Input

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ADEI (BL X)

MySQL Tango BL X

MySQL WinCC OA BL X

Mambo

WinCC OA Archiver Plugin

User Input

Connecting things together

Server structure

ADEI Server
- Caching data
- Web display

Archiving servers
- Beamline 1
- Beamline 2
- …
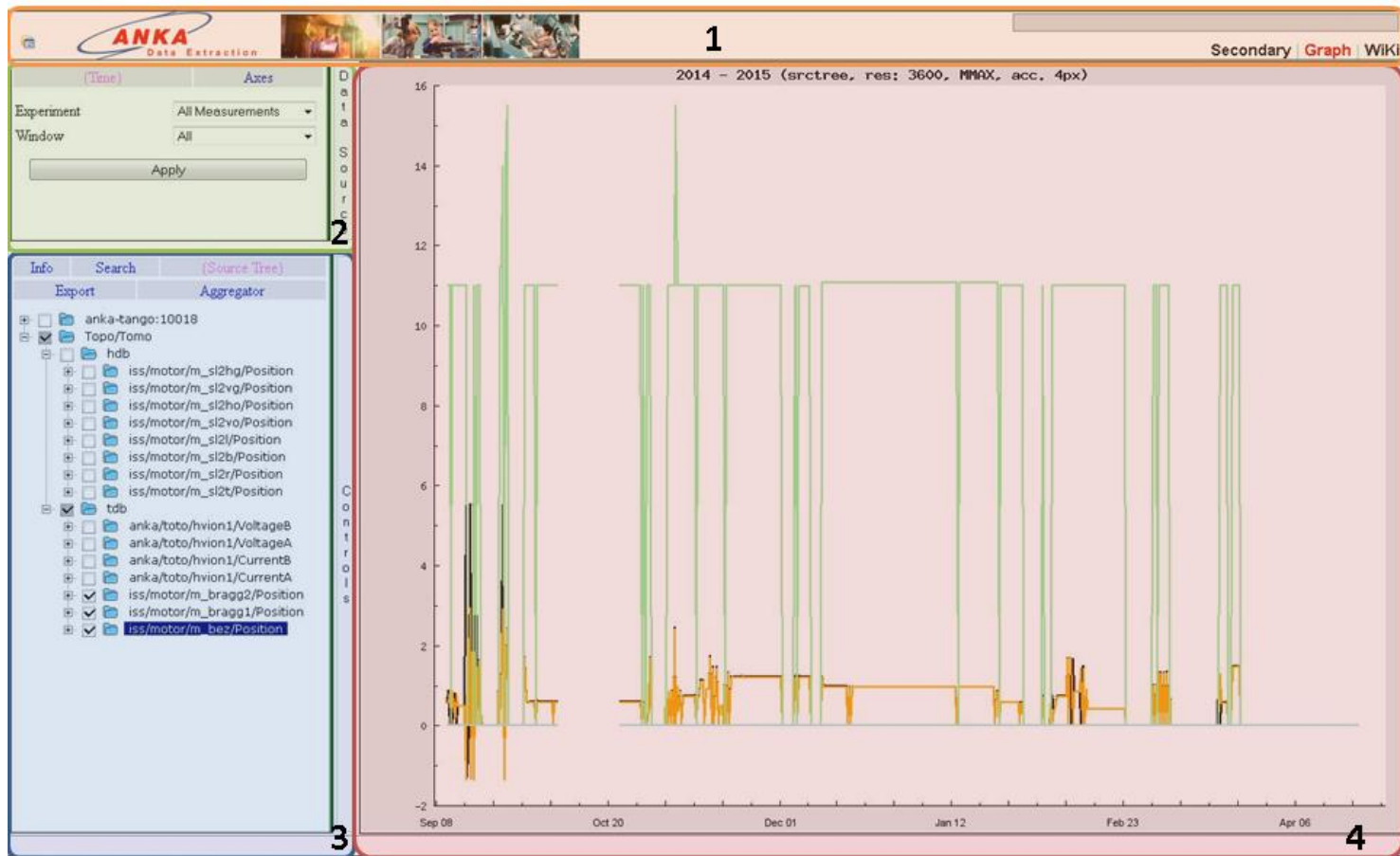- Beamline X

Hardware Requirements

single-server
- Intel Xeon 8 core
- 32 GB RAM
- 12 TB disk space

each beamline
- Intel Xeon 8 core
- 8 GB RAM
- 3 TB disk space

ADEI (Web front-end)

Screenshot of ADEI Web Front-end for the ANKA Tango Archiving System. (1) main menu, (2) dropdown-menu for selecting server respectively beamline, (3) data selection, (4) plot of the selected data.

Summary

- Connection between the 3 systems seems to work well
- Further databases can be easily implemented at ADEI
- Fast access through web front-end to the logged data

- Test running since approx 1 month -> getting first good results
- But the system is still in a „beta" state

Outlook

- Finishing tests of the plugin for WinCC OA to MySQL
- Save function of ADEI plot configs
- Implementation of the ANKA Archiving system at every beamline