Integration and Use of a Beamline History Database

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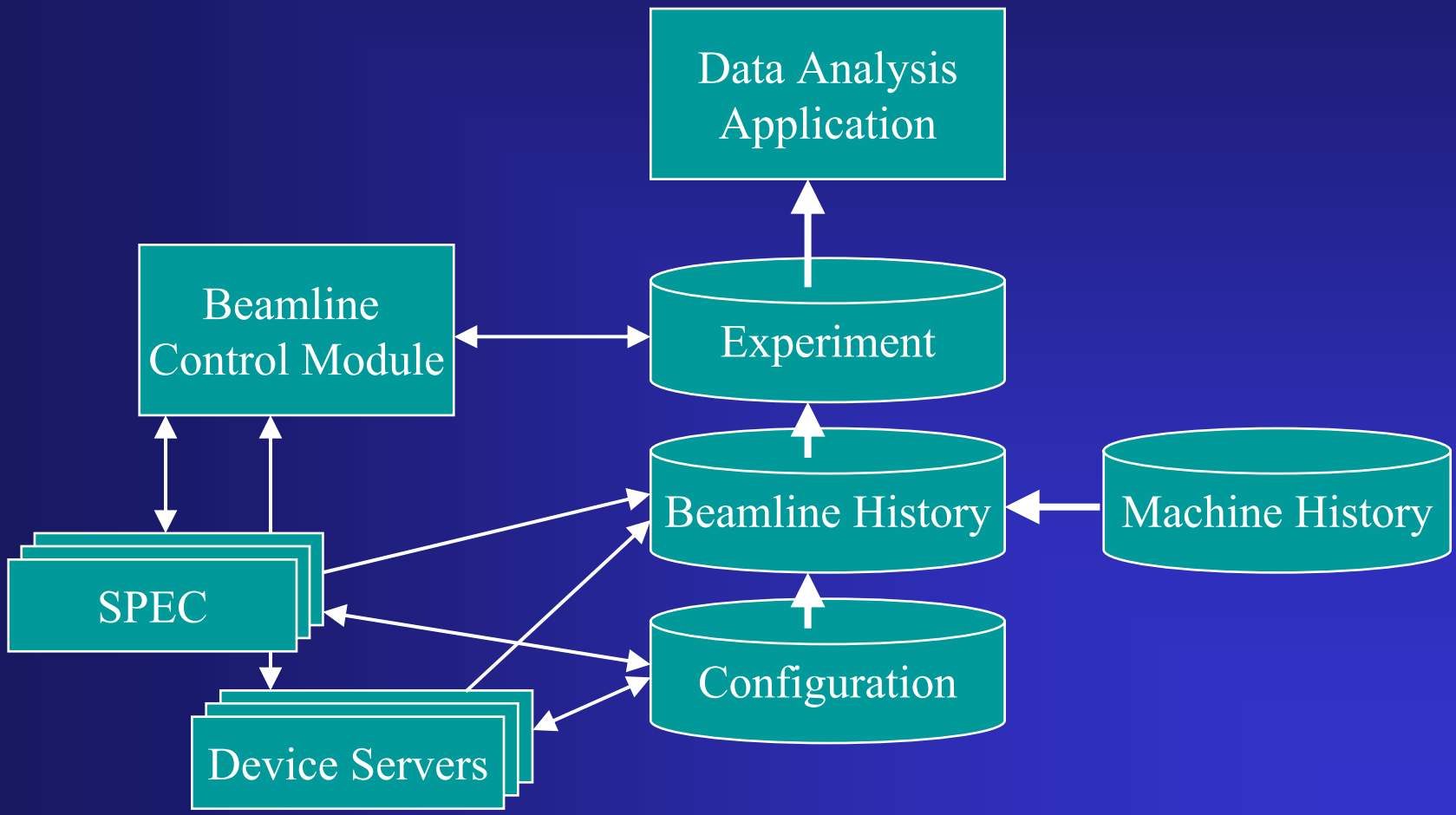
Outline

- Motivation
- Global View
- Actual Status
- The Future
- Conclusion

Motivation

- Store all the beamline history in a central place
- Be able to trace and correlate events in time
- Store and restore beamline configurations
- Correlate experiment data with beamline or storage ring events

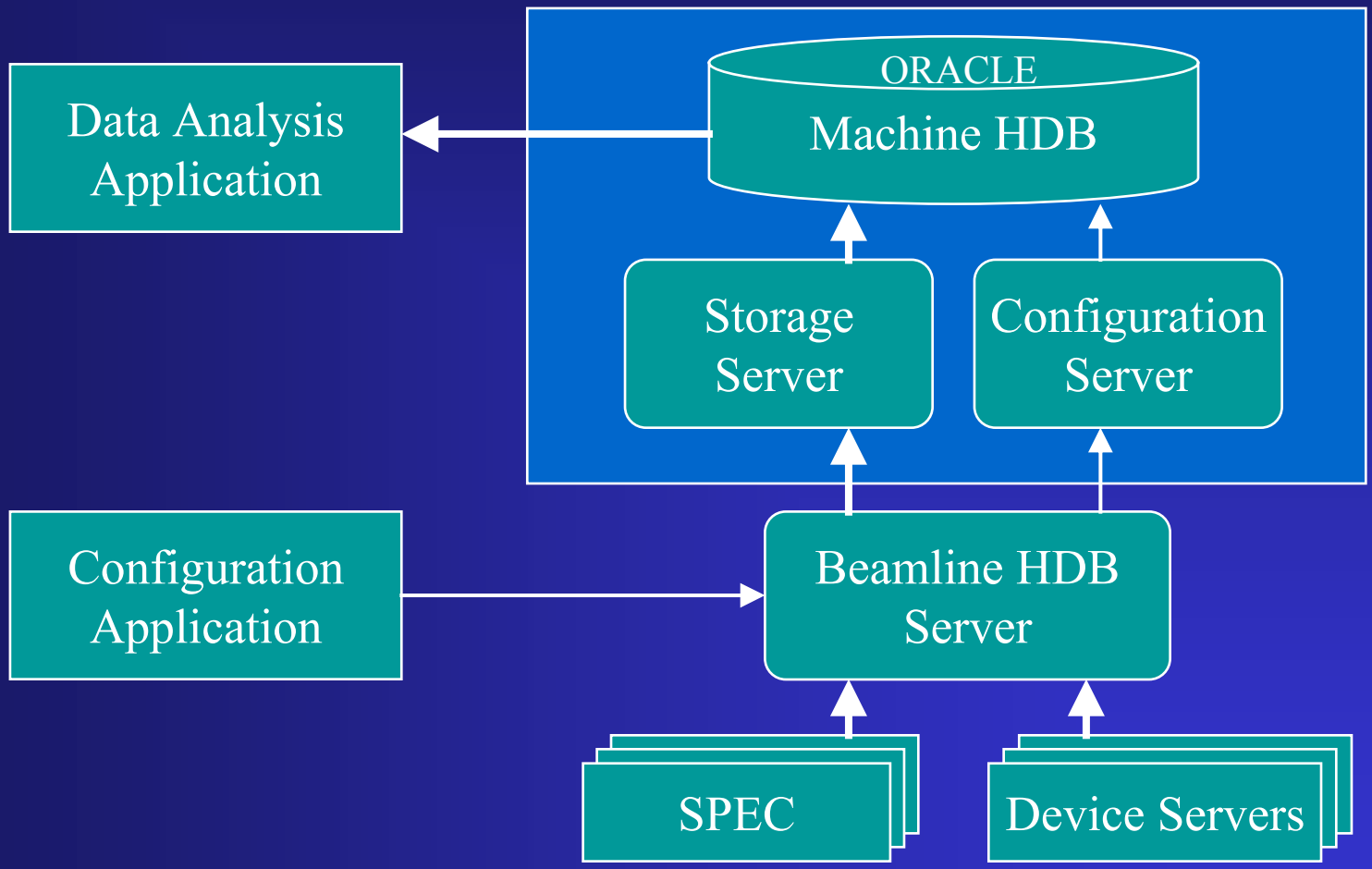
Global View


Data Analysis Application
Beamline Control Module
Experiment
Beamline History
Machine History
SPEC
Configuration
Device Servers

Global View

- Storage of scalar data in time
- Storage of scan data (synchronized data)
  - Scan description
  - Grouped scan spectra
- Storage of snapshot data
  - Snapshot description and identifier
  - Snapshot data

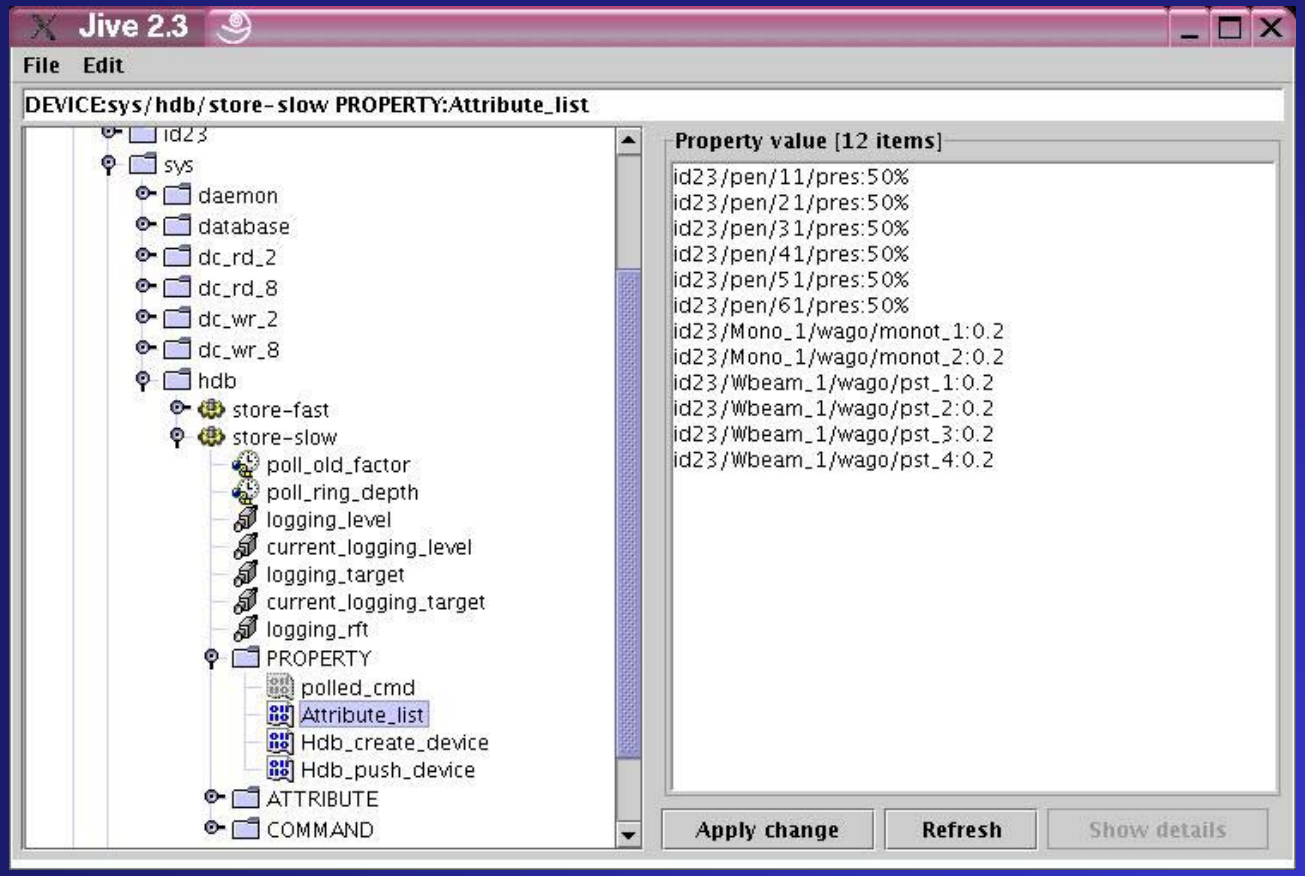
Actual Status



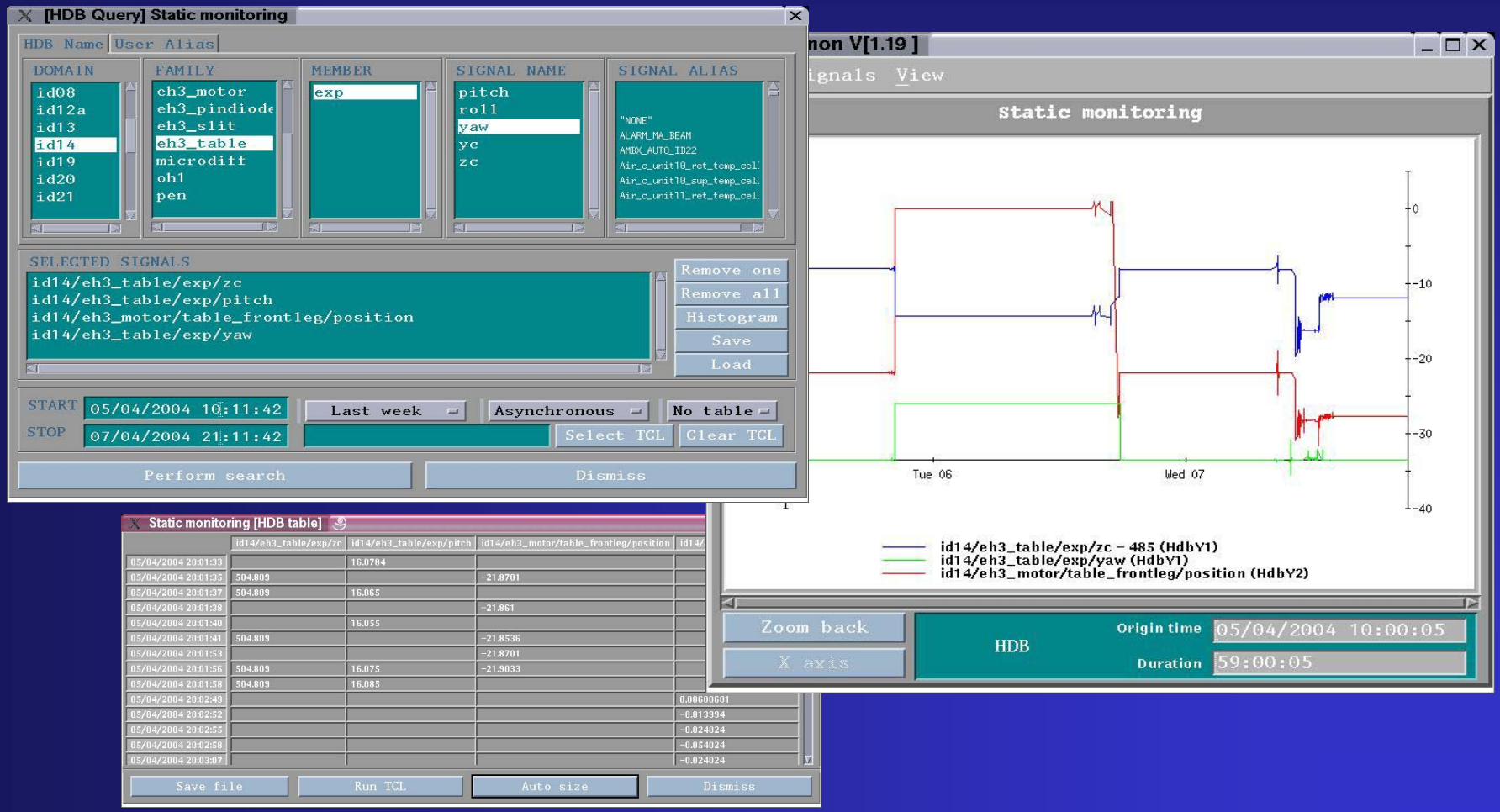
Actual Status

- Data storage from different data sources
  - TACO, TANGO, SPEC
- Dynamic database configuration and storage
- Complete data extraction API in C and data analysis application
- Only storage of scalar data values in time

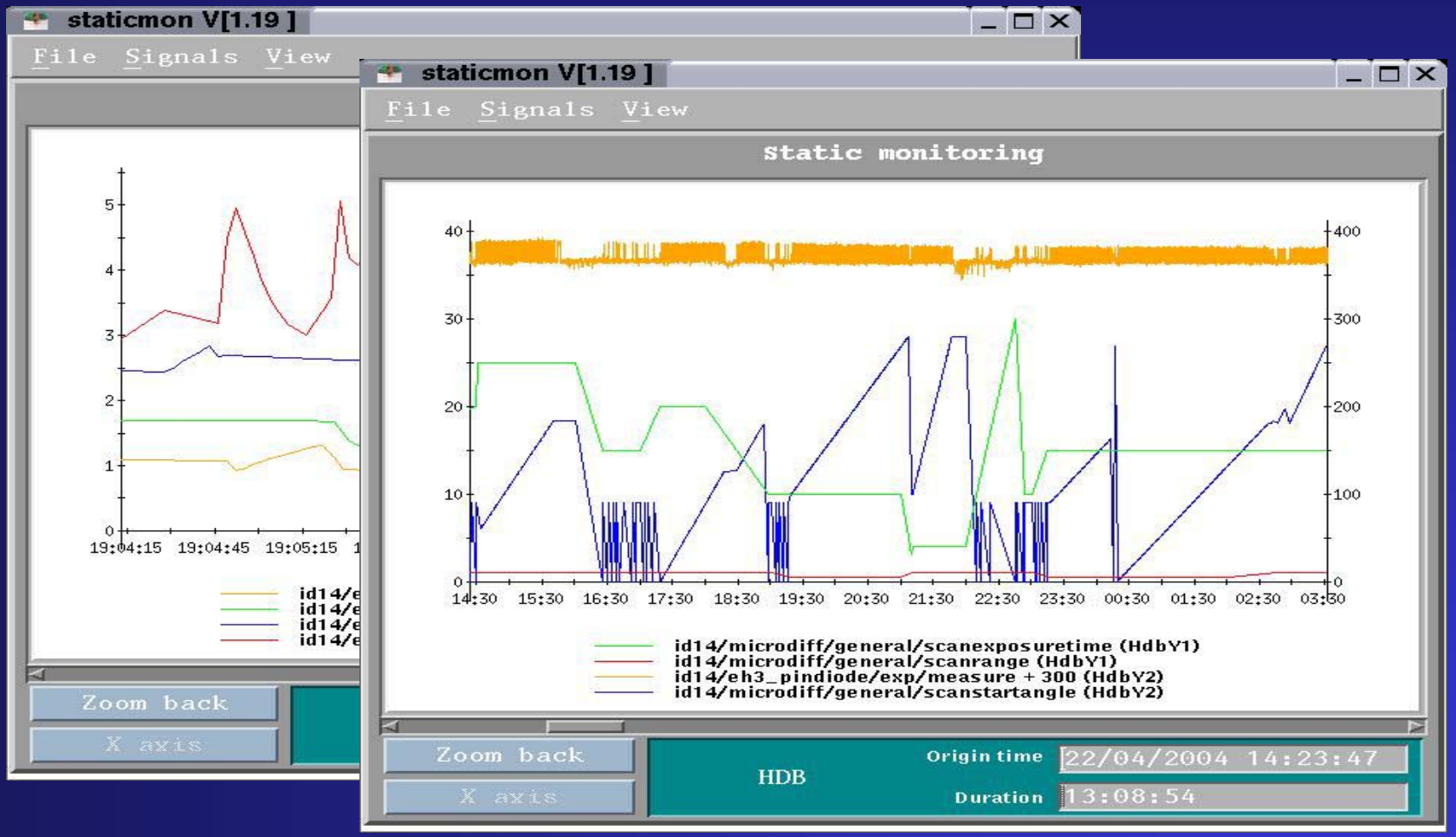
Actual Status



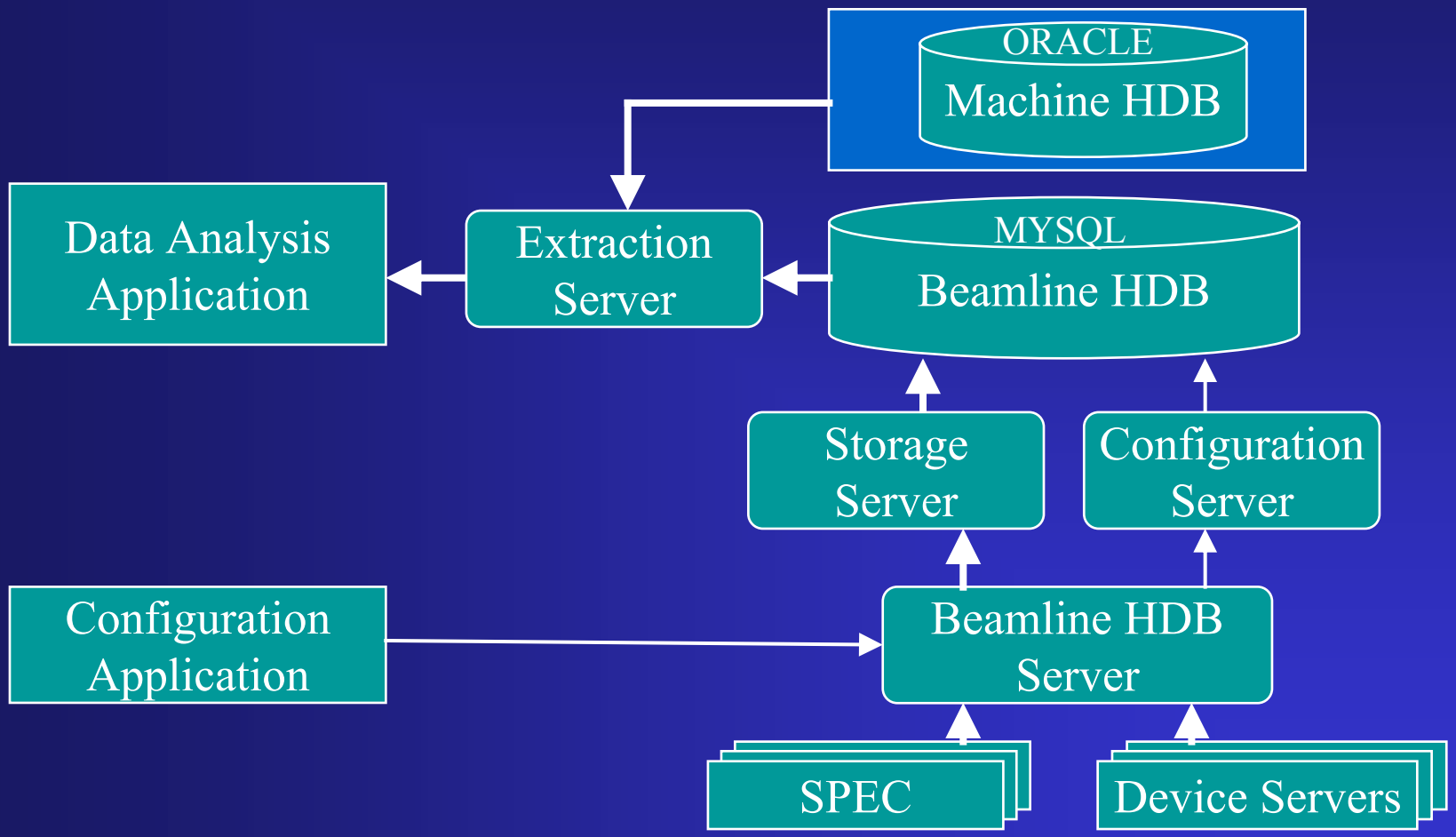
Actual Status



Actual Status



The Future


ORACLE
Machine HDB
Data Analysis Application
Extraction Server
MYSQL
Beamline HDB
Storage Server
Configuration Server
Configuration Application
Beamline HDB Server
SPEC
Device Servers

The Future

- History database installed locally on the beamline
- Joint development with SOLEIL for the TANGO history database
- Data extraction server allows clients to be written in multiple languages
- Storage of scan and snapshot data

How to Use HDB

- To trace and correlate beamline and machine events by the scientist
- In connection with the experiment database to trace beamline or machine events which happened during an experiment
- Saving and restoring experiment conditions or beamline configurations for fast experiment preparation
- To find automation problems by analyzing numerous events of the same type

Conclusion

- A history database as centralized data archive is a necessary part of a beamline
- Performant database browsing and data analysis tools are an important part of a history database project
- Interaction with an experiment database is important to correlate experiment data with beamline events