Toward coherent and controlled data/metadata flow at Laser Particle Acceleration

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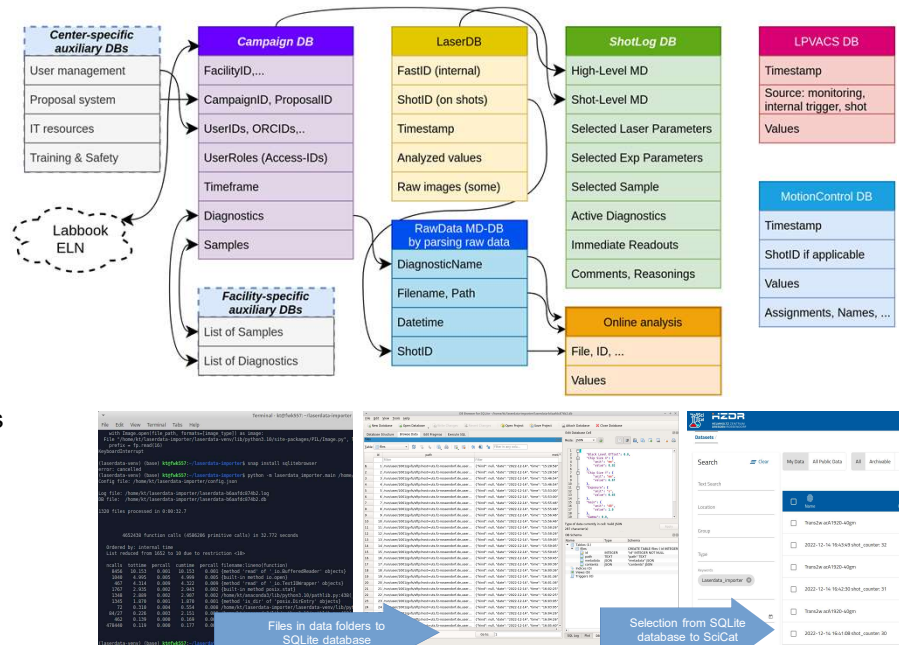
HZDR
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Current improvements and additions to status quo

1) System of databases for data and metadata

- Databases on several levels and scopes
- Databases specific to instrument and workflow
- Implement databases step by step and learn workflows

Example: Laserdata Importer Tool

- HZDR's **laserdata importer tool** extracts data encoded in file locations and names through customizable schemas
  - Uses **fuzzywuzzy** to address inconsistencies in names vs. schemas
- Information is saved as a **SQLite** file but other formats are possible
- Developed a **SciCat extension** to enable prototype upload of specified ranges of ID's coupled with their metadata

Files in data folders to SQLite database → Selection from SQLite database to SciCat
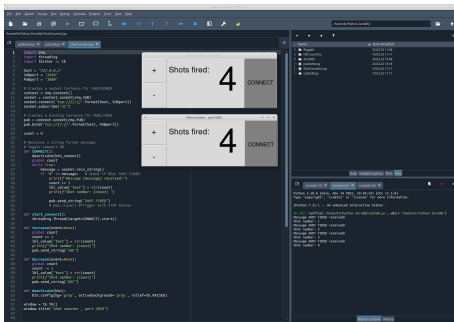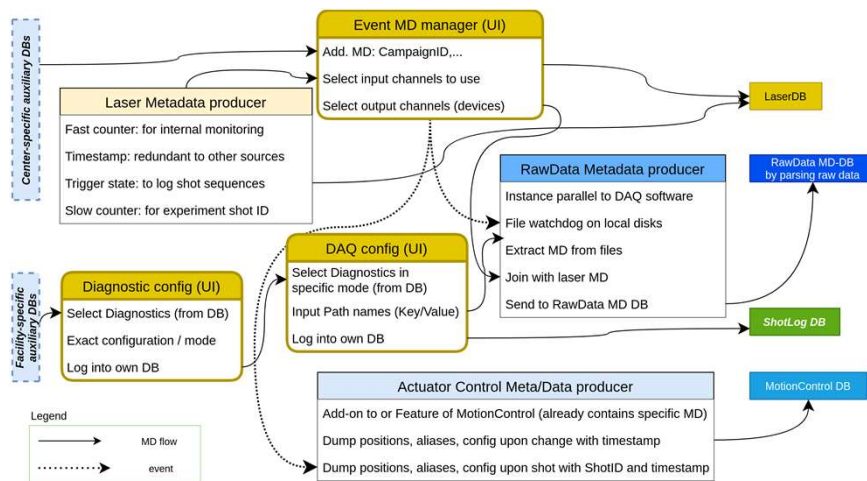
2) Management software layer

- User interfaces for databases to enter data
  - Connected to other databases to simply select existing data where possibly
- User interfaces and stand-alone agents to
  - Control metadata flow
  - Produce, consume and modify metadata

Example: Draco Laser Shot Counter

- Draco Laser produces metadata and uses **zeroMQ** message queue
- Created a prototype **Tkinter** GUI as managing interface on gateway computer (connecting the isolated subsystem networks) to monitor and test messaging and to modify counter value

Transition towards SCADA frameworks

- Long-term effort, center-wide coordination for synergy effects
- Control Data in own database → include in upcoming DB system
- Data can be stored at local file system level (as in existing system)
- Flexible, intuitive GUIs and rich hardware support important
- Include where possible

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