David Erb
Interview Presentation

Presents a recent sample project

Meant to illustrate some of my skillset

Highlight technical as well as non-technical work related competency

Lessons learned

I'll illuminate some of my most valuable takeaway

Slides

1. Introduction
2. Organization
3. Software design
4. Implementation
5. Performance and testing

Organization

My role was beamline contact

Learned what is needed by the users

Worked with them to define realistic goals

Prioritized what was to be done

Separated work into independent tasks

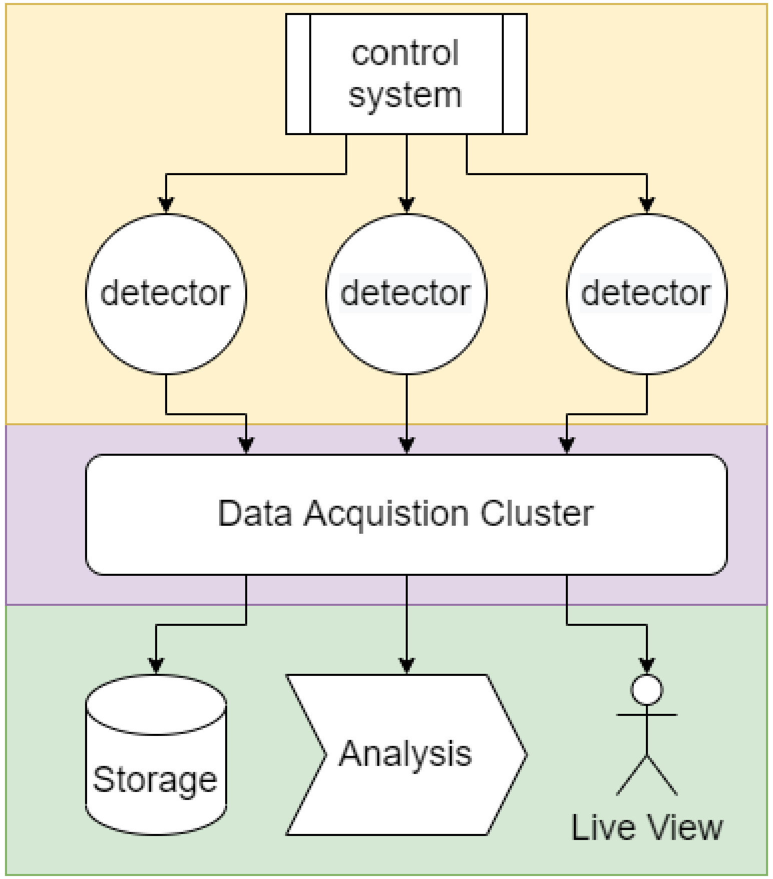
Lessons learned

Central Project Office defines reality

Lots about physics

Everything takes longer than you think!

Application: Short Pulse Xray Scattering with Femtosecond time resolution



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Software design

My role was principal software designer

Worked within existing standards

Defined new components

Invented API

Based on modular plugin architecture

Proposed to group

Lessons learned

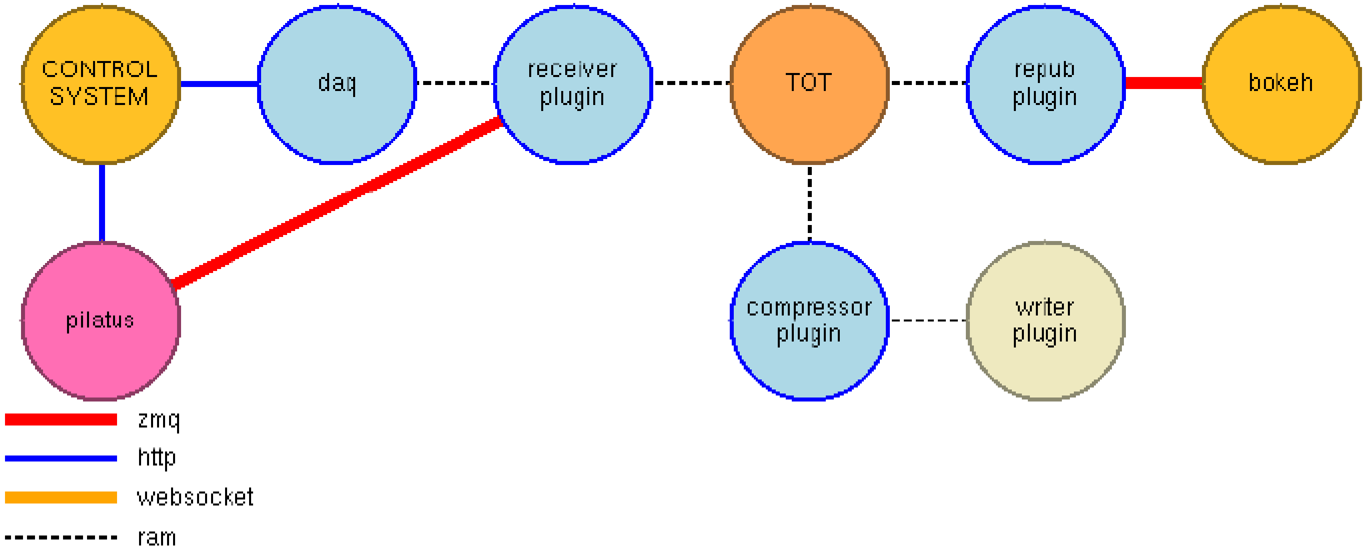
Pros and cons of plugin architecture

Compromise with different points of view among colleagues

Users sometimes change their minds

Design domains:

- Control system
- Networked acquisition and storage
- Live view and post analysis



Implementation

My role was primary coder

Coordinated with colleagues

Wrote independent modules

Used a test-minded approach

Built-in performance instrumentation

Lessons learned

Be ready to be flexible as project begins to get legs

System tests need to be run every day

Different coders have different concepts of robustness

A few of the many modules in the system:

- app_maxiv_femtoscan
  control system and timing orchestration
- svc_maxiv_femtoview
  web service for live imaging
- app_maxiv_femtomax_analysis
  basic analysis platform
- dev_maxiv_pilatus
  control of Pilatus 2D imaging detector
- lib_maxiv_incidents
  embedded performance tracking
- bisstis_maxiv_femtoscan
  built-in self test for daily system check
- cfg_maxiv_daqcluster
  central configuration of infrastructure

Performance/Testing

My role was infrastructure diagnostician

Worked with scientists during commissioning

Devised synchronization validation

Reacted to reports of slowdown/data loss

Improved system tests to reproduce problem

Followed clues to improve performance

Lessons learned

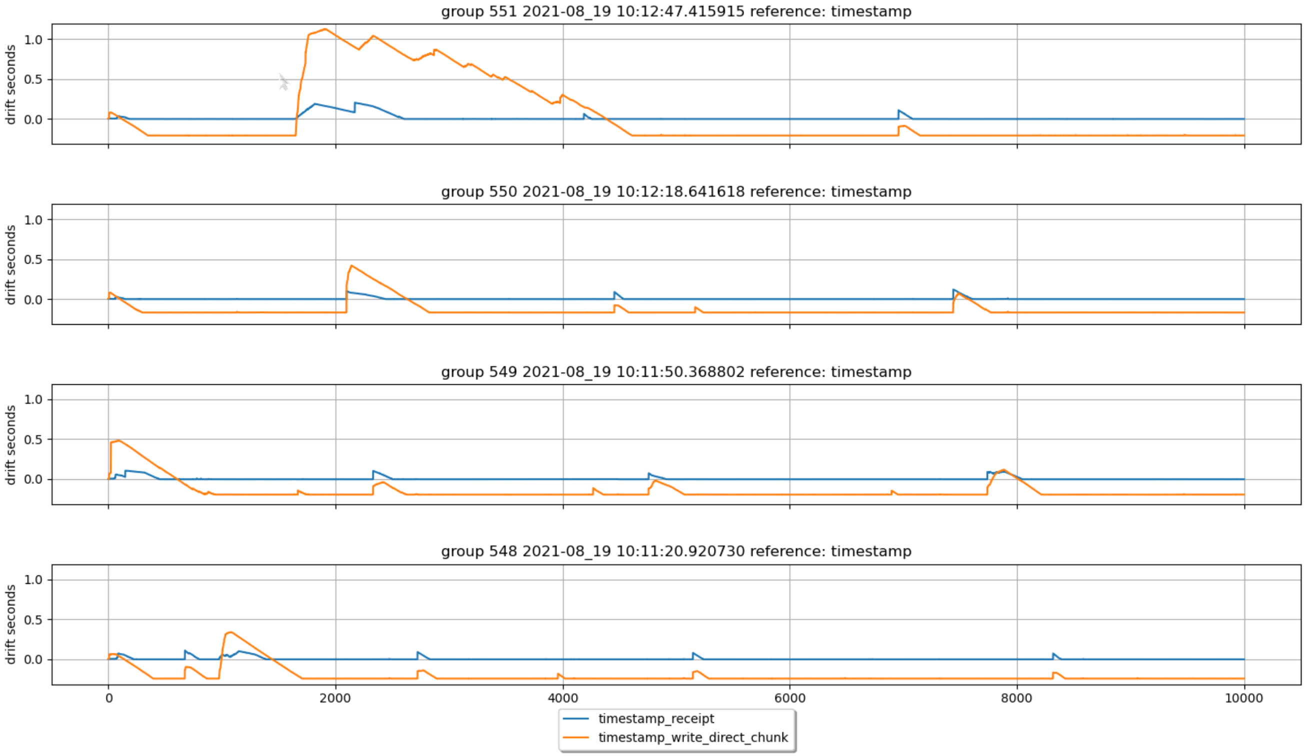
Networks can be flaky

Software gets the blame first

Finishing the software is about half the work

Performance considerations, such as

- Network congestion
- Data volume
- CPU multitasking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drift seconds
timestamp_receipt
timestamp_write_direct_chunk