

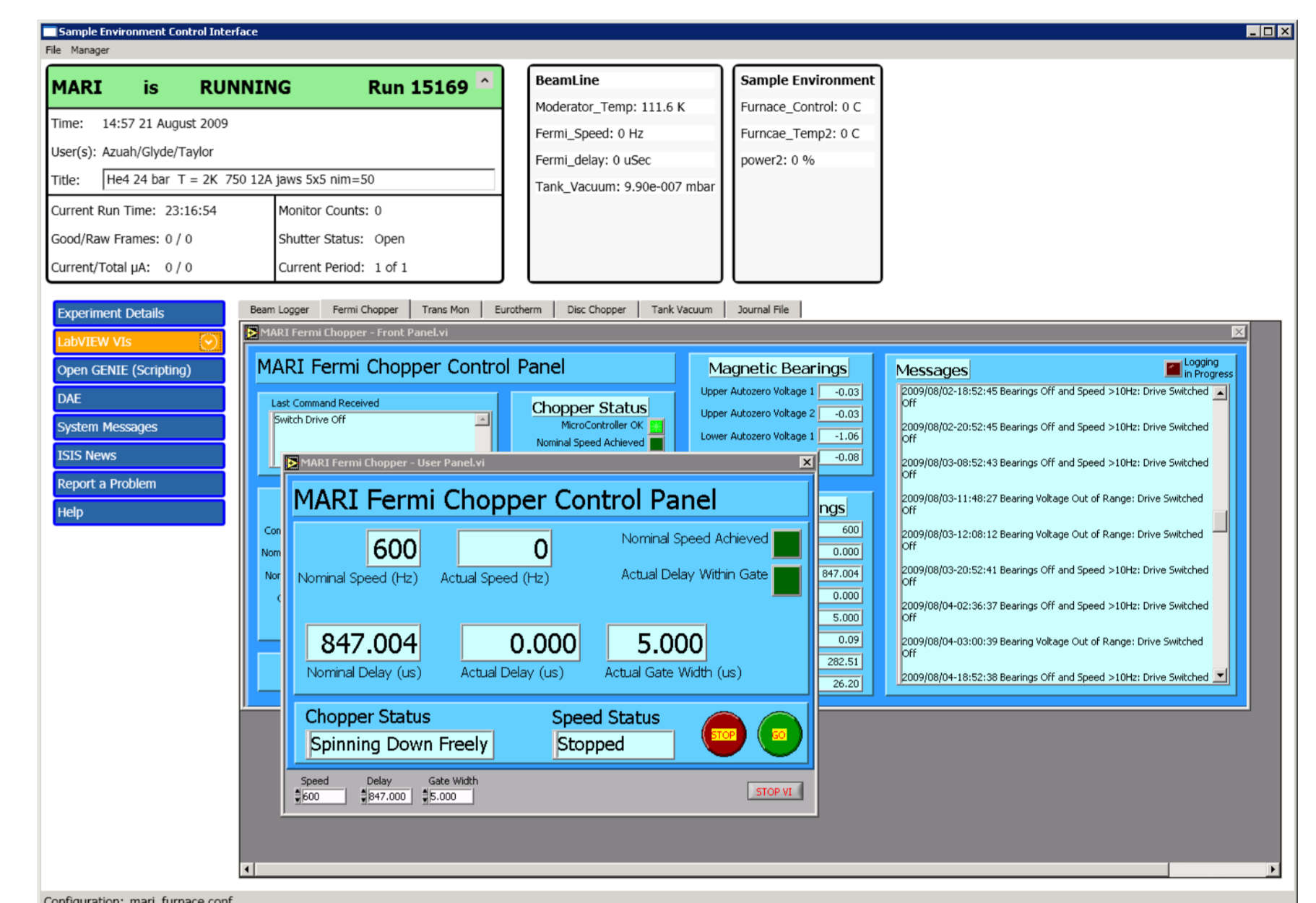
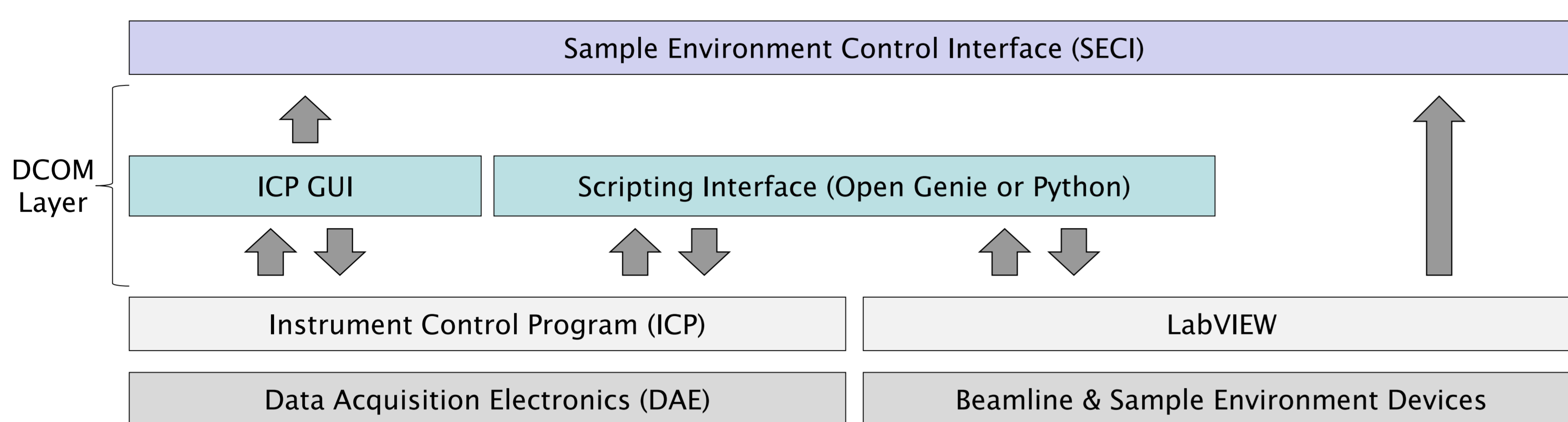
From Acquisition to Analysis: the ISIS data collection pipeline

Introduction

The ISIS data acquisition and control system is mature, having been originally created for Target Station 1 and then extended to meet the needs of the new instruments on Target Station 2. More recently it has been adapted to enable event mode data collection to be performed. The system is currently in use on 30 neutron and muon instruments.

Though the software has changed over the years, the basic building blocks and communication systems have remained the same.

The Instrument Control System

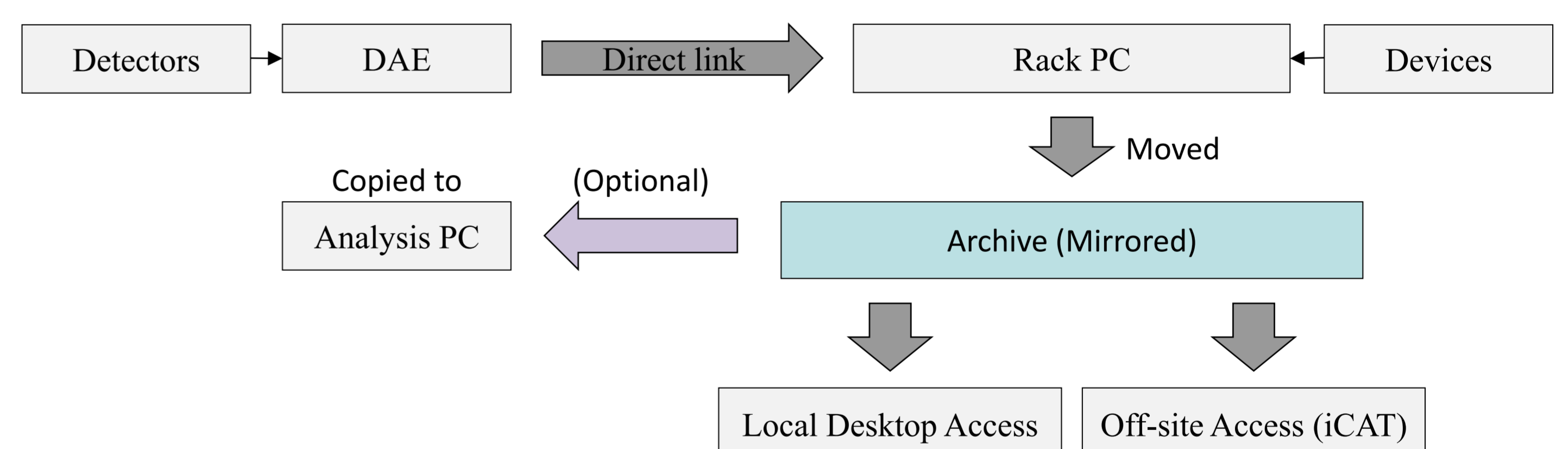


Hardware:

- Single instrument control computer (actually a Windows 7 x64 Virtual Machine)
- National Instruments USB connection to VME chassis for neutron data acquisition (DAE)
- Ethernet to RS232 (via MOXA NPORT) for majority of beamline and sample environment devices

The Flow of Data

- Neutron data stored in DAE until user ends collection (non-event mode)
- In event mode the data is continuously streamed to the control PC
- Sample environment data stored SQL database
- Final data file written in NeXus format
- NeXus file copied to archive
- Data accessible internally via data directory
- Data accessible off-site via the iCAT portal
- Data can be analysed via Mantid



The Future

Currently in progress:

- Migration from the Open Genie scripting language to Python
- Synchronisation of data collection with motion of multiple motor axes
- Creation of script generator to help users better plan their experiments
- Exposing real-time event data for live display and analysis via Mantid

Short- to medium-term plans:

- Introduction of the next generation DAE (faster, greater memory, Ethernet-based communication)
- Incorporate EPICS as part of the control system

Long-term plans:

- Redesign the control system architecture to improve maintainability and flexibility