

September 22nd, 2016

PYDM

A Python Alternative to EDM

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Motivation for a new Display Manager

Development Issues

- Support for image handling is poor
 - Unnecessary strain on network
 - No color displays
 - Basic client side functionality is non-existent
- Higher level application design is time consuming
- Hard to customize style
- Widget positioning is absolute

User Issues

- Window management is difficult
- Flexibility between different resolution monitors

Why Python?

Python is the most commonly used language among controls , data acquisition/analysis and scientific groups

Willing to trade a small amount of performance to leverage a larger development community

Python interfaces are already ubiquitous for IOC applications and tools

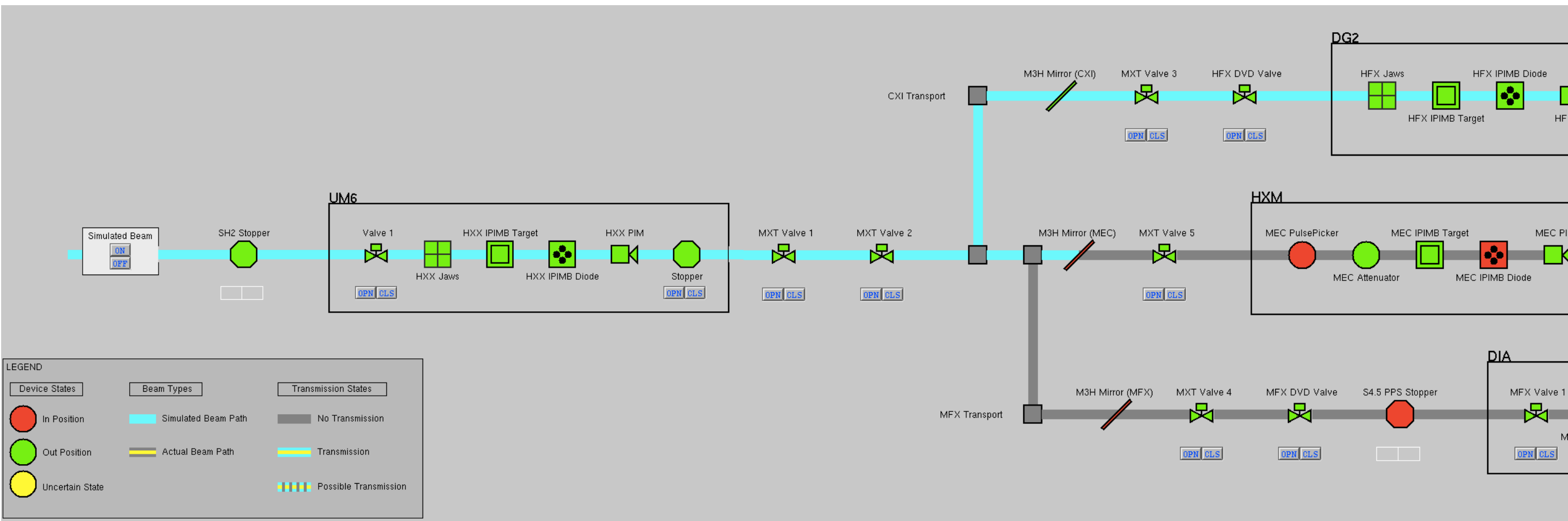


A Fork in the Road

- Existing solutions for getting EPICS information in both caQtDM and EPICSQt
- No choice has Python capabilities
- Python bindings can be created using SIP for C++ Widgets
- Automatic conversion scripts in caQtDM
 - *Over 5000 EDM files to convert*



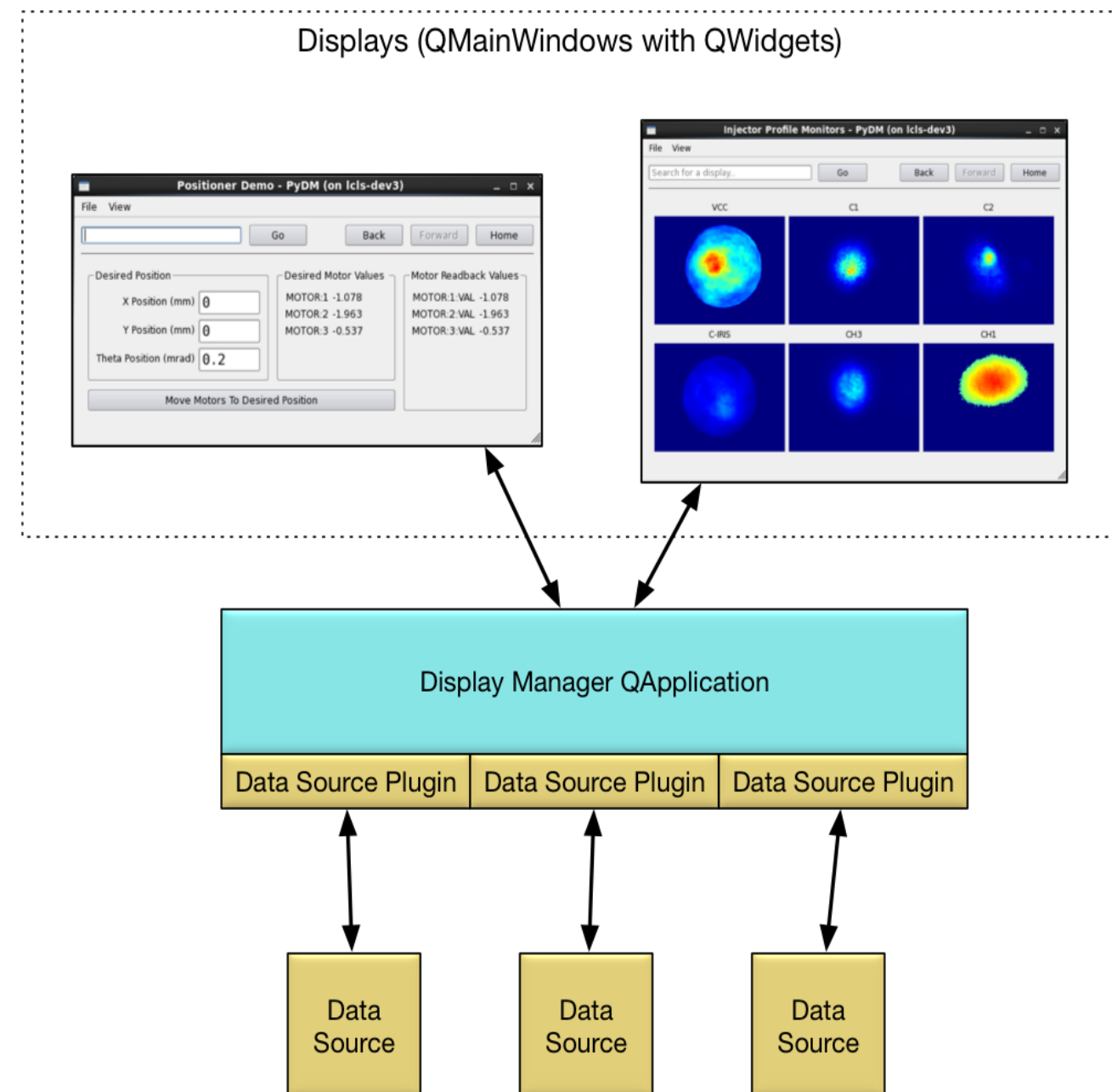
Maintenance



Strength in Flexibility

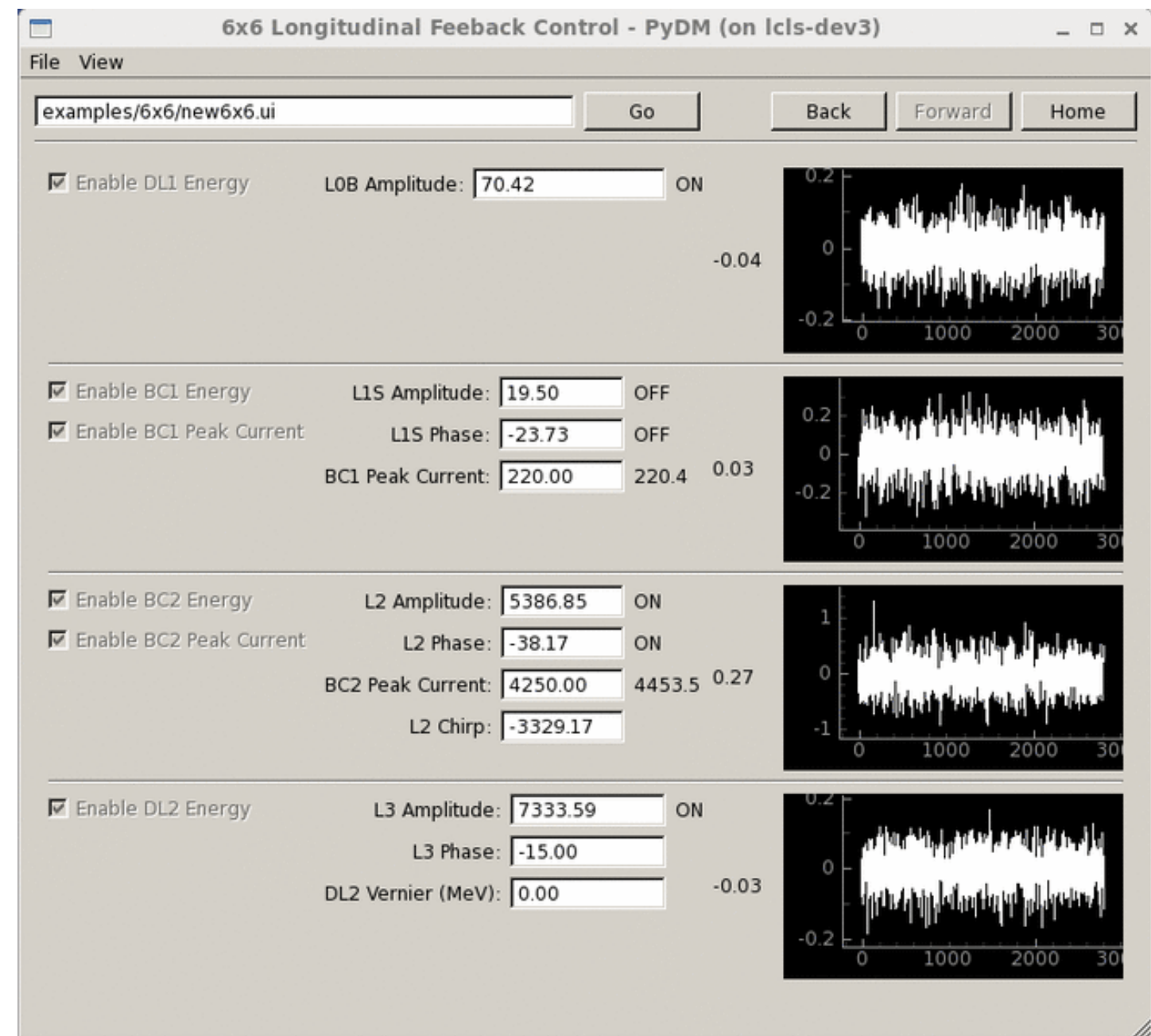
- **Needs to support a dynamic experimental environment**
- **Applications can be created in a WYSIWYG editor**
- **The option to create screens programmatically**
- **Provide a unified Widget set for the existing higher level applications**
- **Generate screens procedurally**

- Widgets must be source agnostic
- Contains a flexible plugin based system
 - *Allows for information from data acquisition, Python services, EPICS, and EPICS Archiver*
- Plugins are relatively simple to code
 - *100 to 200 lines of code*
- Browser-like setup for better Window Management

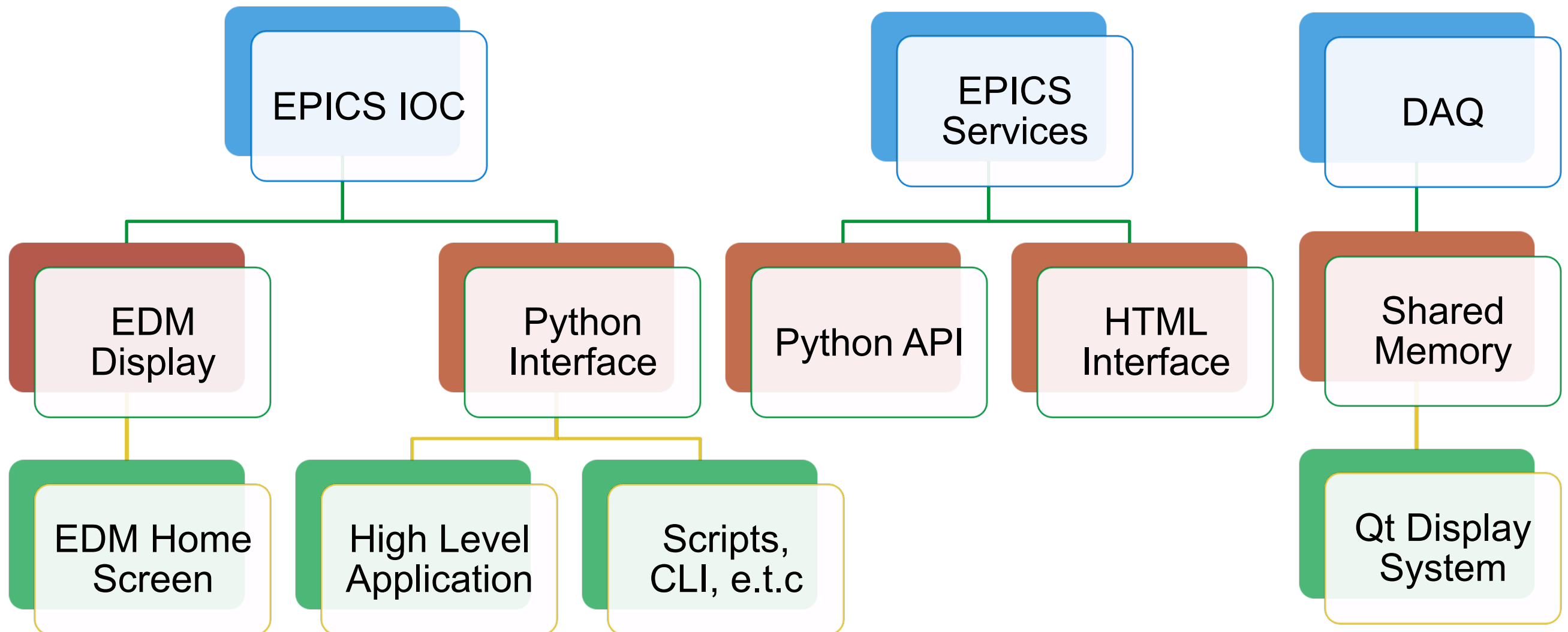


How it Works

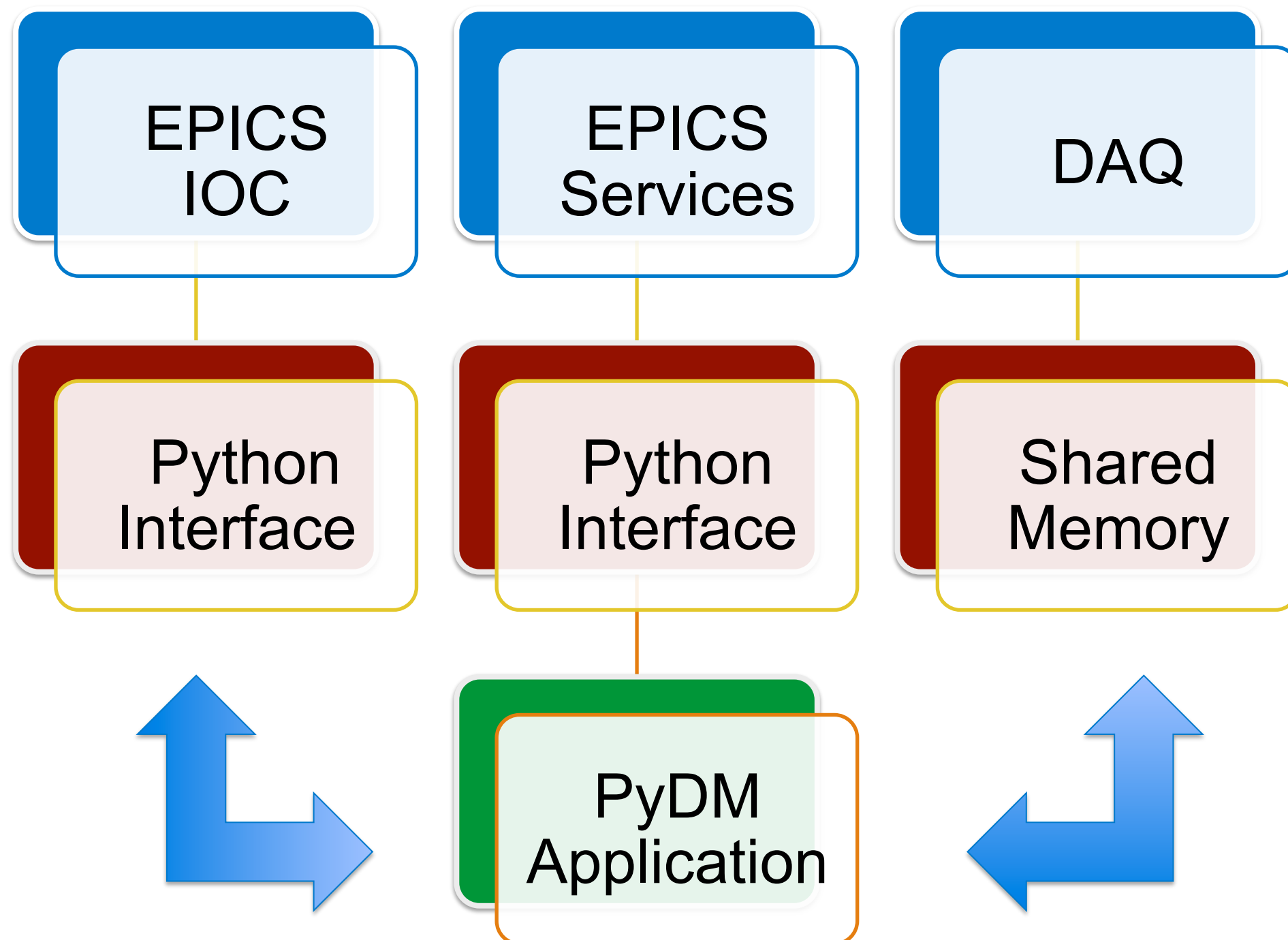
- Uses pyca for Channel Access
 - *C with Python Interface*
- Utilizes Qt's signals/slots framework
- Different data sources with unique interfaces transmit information using a generic 'PyDM Channel'
 - Protocol is selected with a URL like structure
 - *ca://*
 - *arch://*
 - *py://*



Current Infrastructure

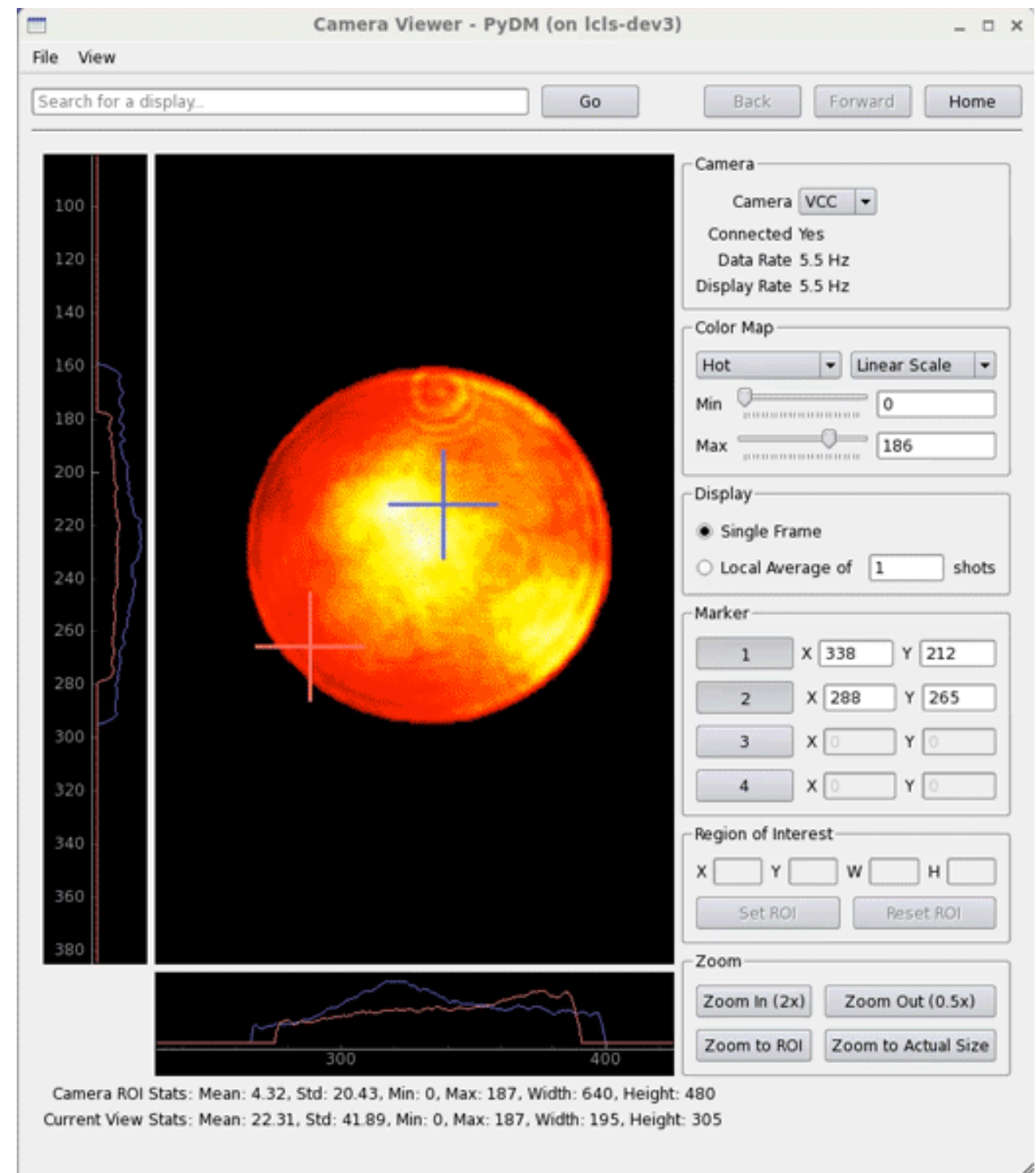


Future Infrastructure



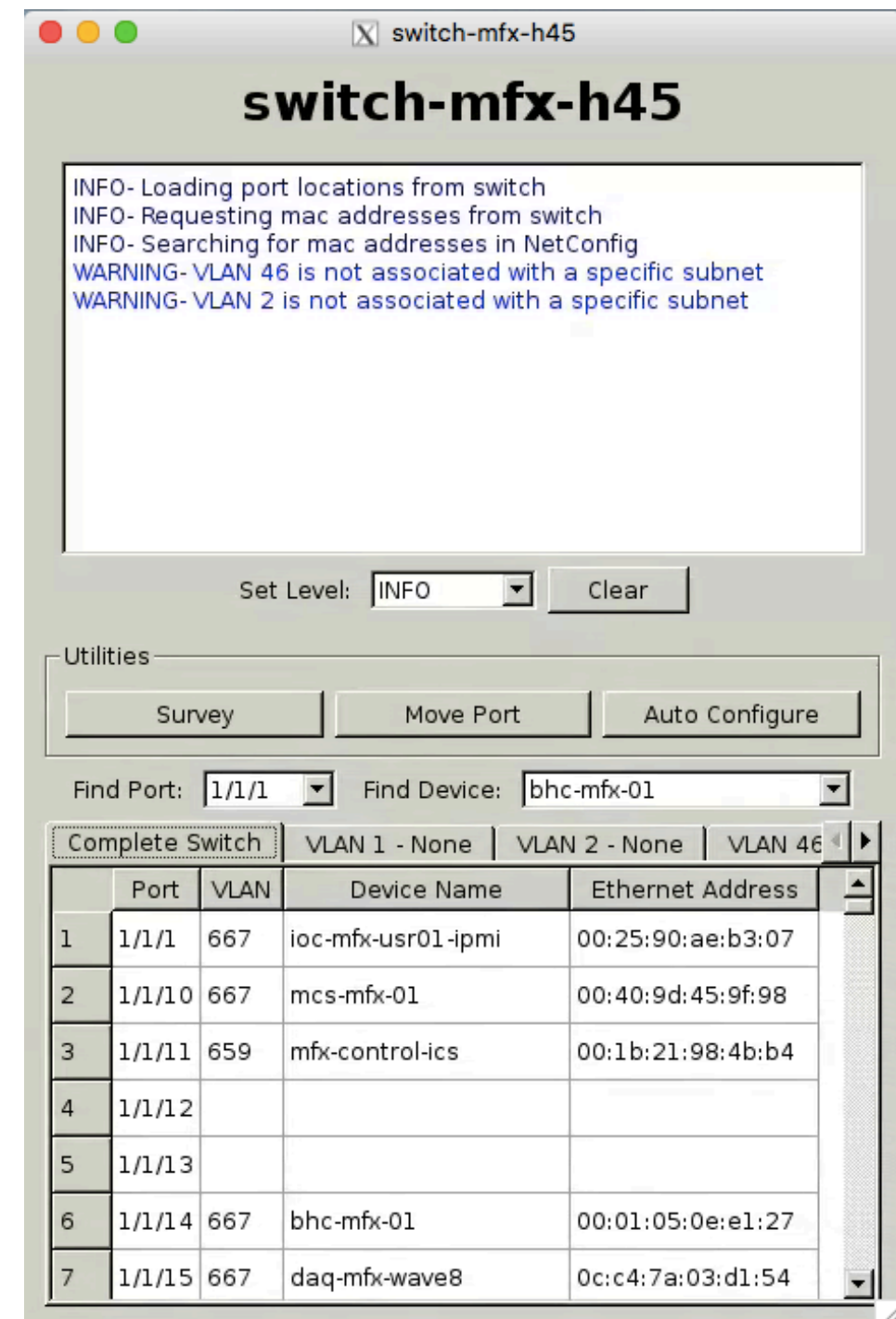
Deployments : Camera Viewer

- Already in use for EPICS image displays
- Monitors dead time to disable forgotten windows
- Was created before cameras were merged into areaDetector
- Improvements
 - Work directly with areaDetector plugins
 - Include motion for camera zoom and focus



Deployments : Network Switch

- Easy to embed other Applications
- Information that can be accessible through V4 in the future
- Not necessary to create IOC
- Created command line interface along with UI
 - minimal code required
- Dynamically created, no changes to source code necessary



Future Developments

- Limitations need to be quantified
 - How fast?
 - How many?
- Use SIP to introduce caQtDm Widgets
- Create a flexible camera viewing screen that works directly with areaDetector
- Begin converting existing screens

Acknowledgements



Matt Gibbs

Alisha Babbitt

Zachary Lentz

Amedeo Perazzo

Dan Flath

Alex Wallace

Dan Damiani