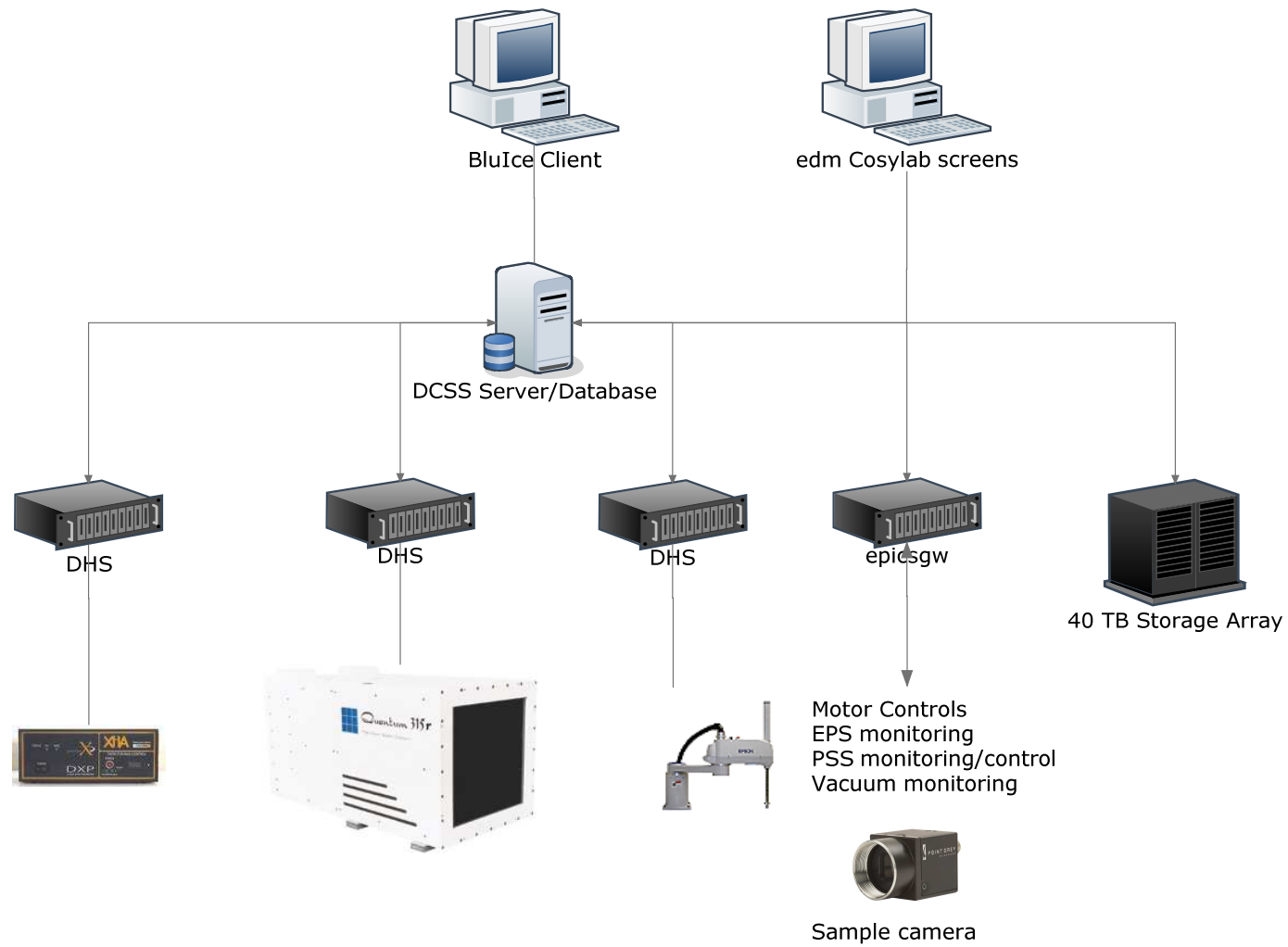# Crystallography beamline controls at Australian Synchrotron

by Dr. Mark Clift
June 2011

- 3 Metre IVU source from Neomax/AS
- Photon delivery system - by FMB Oxford/Cosylab
- EPICS with EDM screens
- SSRL BluIce, DCSS/DHS system – by AS
- EPICS (epicsgw DHS)

- Successful collaboration with SSRL
- Milestone objectives achieved

Victoria
The Place To Be

BluIce Client

edm Cosylab screens

DCSS Server/Database

DHS

DHS

DHS

epicsgw

40 TB Storage Array

Motor Controls
EPS monitoring
PSS monitoring/control
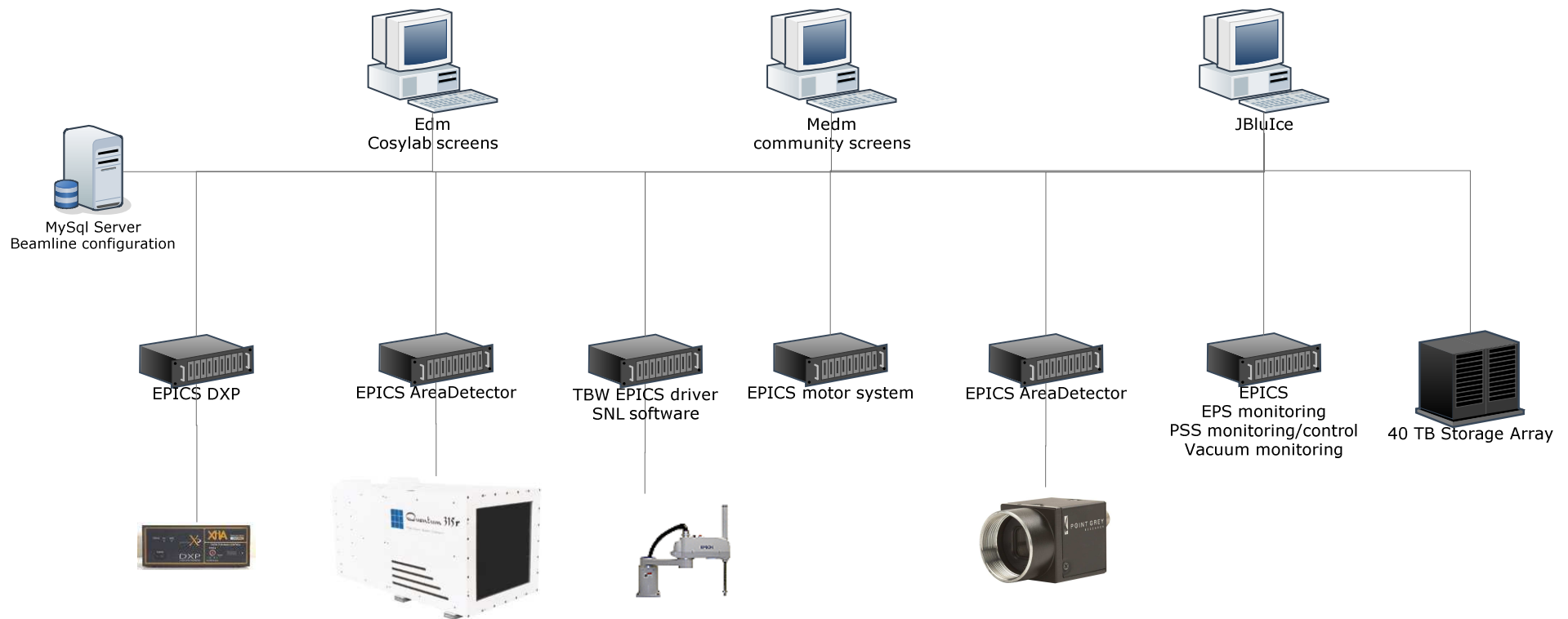Vacuum monitoring

Sample camera

- AS has different philosophies from SSRL
  - Keep it simple
  - EPICS centric
  - Keep the logic in EPICS, where possible
  - User interface should be a simple CA and database client, that looks and functions like SSRL BluIce
  - Database configuration should use a standard open source mechanism

Victoria
The Place To Be

- Reliability became an issue
- DCSS hard to support/enhance
- BluIce hard to support/enhance
- DCSS/BluIce Unique to MX beamlines at AS
- DHS code often had no shutdown routines, causing bus lockups, etc.
- Monitors from motors or coordinate systems were often missed by DCSS
- EPICS was only minor part of control system
- Separating code base from SSRL
  - Logic in BluIce/DCSS

Victoria
The Place To Be

- Assess JBluIce compared with DCSS/BluIce
- Remove DCSS/DHS
- Community EPICS modules used instead of DHS
- EPICS drivers to be written where no community software exists
- All communication becomes EPICS CA
- JBluIce to replace BluIce
- Mysql used for beamline configuration

Victoria
The Place To Be

Edm
Cosylab screens

Medm
community screens

JBluIce

MySql Server
Beamline configuration

EPICS DXP

EPICS AreaDetector

TBW EPICS driver
SNL software

EPICS motor system

EPICS AreaDetector

EPICS
EPS monitoring
PSS monitoring/control
Vacuum monitoring

40 TB Storage Array

GMCA CAT/AS MX Comparison			
GMCA CAT Hardware	**GMCA Software**	**AS MX Hardware**	**Proposed AS Software**
ALS Pneumatic robot	Custom EPICS DB/SNL	Epson robot	Custom EPICS DB/SNL (TBW)
VME Delta Tau motor controllers	TPMAC EPICS driver	Ethernet Delta Tau motor controllers	Cosylab M-Comm driver
AXAS silicon drift spectrometer			
Canberra NIM module	Community MCA EPICS module	XIA Saturn vortex spectrometer USB	Community DXP EPICS module
MAR CCD camera	Custom EPICS DB/SNL (FPE)	ADSC 315R CCD camera	Community areaDetector EPICS module
IQEYE, AXIS	URL	Point Grey Fea2 Firewire	Community areaDetector EPICS module
Oscillation function	FPE	Oscillation function	PMAC, areaDetector, EPICS DB/SNL (TBW)
	Jblu-Ice GUI		Jblu-Ice GUI (TBR)
	Mysql		Mysql
	Different hardware/software		
	Same hardware/software		

Victoria
The Place To Be

- Beamline unavailable for users
  - Parallel DCSS/DHS and JBluIce systems will be maintained during implementation
- Separating code base from GMCA CAT
  - GMCA CAT and AS have similar philosophies
- Getting JBluIce to monitor/control:
  - Motor system
  - DXP spectrometer
  - Quantum CCD detector
  - Sample robot
  - Sample cameras

Victoria
The Place To Be

- Very early days (told to assess)
- Change over team assembled – EPICS, Mysql, and Java knowledge
- Quantum CCD areaDetector application running
- Sample camera areaDetector application running
- Attempting to get JBluIce talking with AS motors

Victoria
The Place To Be

- Thanks GMCA CAT for your generous hospitality

- The saviours..
- Sergey, Oleg, and Mark

     • More requests for help to come. ☺