DIAMOND LIGHT SOURCE CONTROL SYSTEMS RDB

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ABSTRACT

The functionality of the Diamond Light Source Control Systems Relational Database (RDB) is described here. An Oracle-based RDB and web-based GUIs allow recording of system configuration and configuration change management. Information about the hardware components that make up each control crate is stored in the RDB; for each component, the status, the location and the name of the person responsible for the item are held. The Diamond Control System is based on EPICS and has of the order of 500,000 process variables. The RDB maintains a record of the names of these PVs and validates new names against the Diamond Naming Convention, allowing consistency of naming style to be maintained and avoiding name duplication.

Machine operational details such as alarm logs are stored in the RDB and viewed using a web browser. All process data recorded by the control software are archived using the EPICS Channel Archiver; the archiver configuration for each technical area is maintained in the RDB. A further application using the RDB is the electronic logbook (eLog) which is used to record activities by Diamond Operations and Beamline groups.

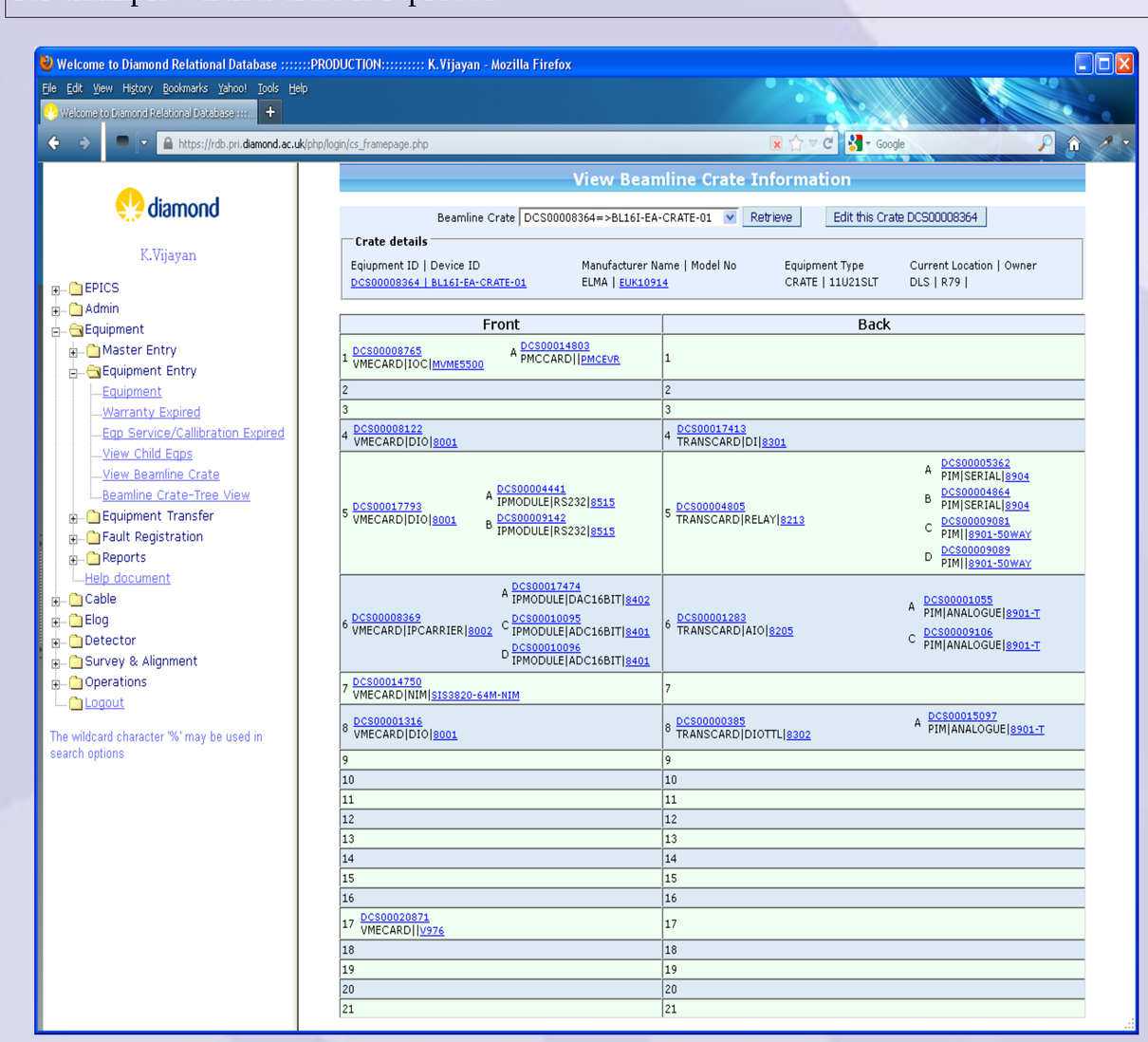
Equipment database

The equipment tracking database stores all information about each item of hardware equipment, such as the manufacturer name, the model, and the type of the equipment (crate, IP carrier, etc.). Each equipment item is uniquely identified by its equipment ID in the database. For each equipment item, the status, location and name of the person responsible for the item are also held in the database.

This tracking system identifies the present physical location of each item of equipment together with its history of transfer.

If an equipment item becomes faulty, the fault can be registered using the fault registration web page in the database. Once the fault has been corrected, either by the manufacturer or internally within Diamond, the details of the repair can be stored in the database. Thus a full history record for the equipment item is maintained in the database.

The hardware components that make up each control crate are stored in the RDB. Users can easily modify the crate information using a web browser. The equipment tracking system has the facility to move all the equipment within one crate to another, for example when a crate is replaced.



Diamond Naming Convention

A record of all EPICS process variable names is maintained in the RDB.

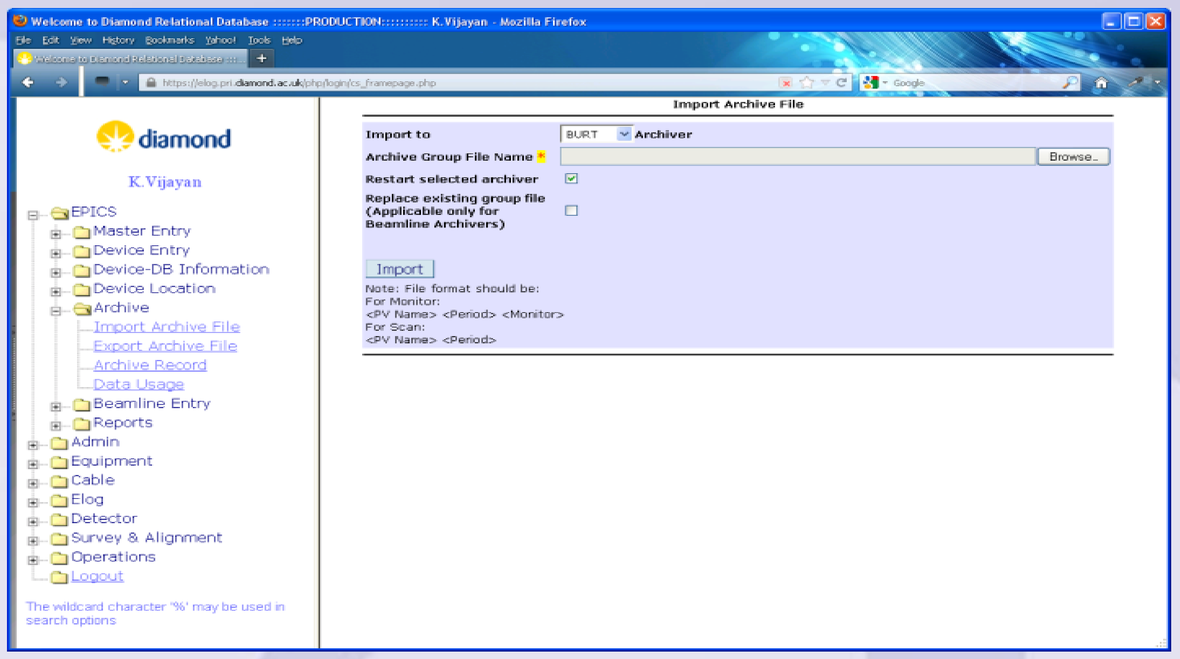
The RDB allows a web user to add, modify or delete name parts, for example when a new component type is introduced, as well as complete PV names.

New PV names are validated against a documented device naming convention, and checked to avoid duplication.

Alarm log/Archiver

The EPICS Alarm Handler (ALH) is used to log process variable alarms into text files. The contents of these files are automatically imported to the RDB in order to allow them to be viewed using a web browser.

All process data recorded by the control software are archived using the EPICS Channel Archiver. Redundancy is provided by the use of two identical servers which archive data in parallel, though one server is designated the primary archiver and the other as the standby. The archiver configuration for each technical area is maintained in the RDB. This gives users the flexibility to import their individual technical group files to the RDB using a web page. Following such an import, a script restarts the selected archiver process in both archive servers with the updated group file.



Elog

Electronic logbooks are used by the members of the Diamond Operations team and several Beamline groups to record their activities in the storage ring or beamlines. Each group has its own logbook. eLog messages have a title, a message body and a category. The content of the message body is based on HTML, and so can include normal text, images and URL links. An eLog entry can be made in many ways: using the eLog web client, via Microsoft Outlook Email, by means of Blog editors or by setting up automated entries.

The eLog web client allows users to save their logs as draft and preview their draft entries before publishing. Using AJAX (Asynchronous JavaScript and XML) the content is saved automatically every minute without user intervention.

Once published, an eLog entry cannot be modified or deleted. A facility is provided to allow a user to replace an incorrect entry; the replacement entry is then marked as such and provides the means to view the original entry.

Web log (Blog) editors such as Windows Live Writer (WLW) or Classic ScribeFire can also be used to make entries to a logbook.

By using the ink Blog add-on to Windows Live Writer, users can import handwritten pages and incorporate them in entries to the logbook.