Spiral2 control COMMAND: A STANDARDIZED INTERFACE between high level applications and EPICS IOCs

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The Spiral2 project

Tomorrow’s physics is under preparation at GANIL. The future SPIRAL2 linear accelerator will produce light and heavy exotic nuclei at extremely high intensities. These entirely new particle beams will make it possible to explore the boundaries of matter. SPIRAL2 (Second Generation System On-Line Production of Radioactive Ions) is a linear particle accelerator project for the study of fundamental nuclear physics and multidisciplinary research.

This facility, which is as large as the current GANIL installation, will produce the only beams of their kind in the world, starting in 2012.

Accelerator construction

After the design phase for the whole process, the building construction started by the beginning of this year to be achieved in 2012.

EPICS modules Specification template

Hereafter, the main chapters of our EPICS modules specification template are exposed with a few words about the aim of each chapter.

The use of UML is illustrated with examples of extracted from the profiler module specification, which is our practice reference.

1 Requirements & Constraints
- Definition of the general context of use
- Identification of HW constraints & SW dependencies
- Expression of performance requirements

2 Functions Specification
- Specification of the functionality needed by OPI

Function Description PV Name (Not)-Monitorable
Read/Write Parameter from/to PV Type Information about the parameter

CA Command (caput or caget)
Table used for function specification

3 Architecture : Static Model
- Functional packages definition relying on stable data

4 Architecture : Dynamic Model
- Defines events triggering EPICS DB processing
- Defines the EPICS DB activities
- Defines the sequence of activities execution

Spiral2 control system

The Spiral2 Control System is designed with a typical EPICS architecture, relying on OPI Clients and IOC servers communicating using Channel Access (CA) protocol.

The field deployment relies on Linux PCs and servers, VME VwWorks crates and Siemens PLCs.

In order to improve the efficiency of the collaboration between the laboratories involved in development, a special care is taken to the software organization. We already defined an EPICS reference work areas specific to SPIRAL2 and use version control system (SVN) to store and share our developments.

The next chapters are the definition of a "standard" interface between OPI and EPICS databases and the definition of a template for EPICS modules specification.

Main Activity UML diagram of the profiler DB

Process Data UML diagram of the profiler DB

Package UML diagram defined for the profiler DB

Sequence UML diagram showing how to use the profiler

Expressions of performance requirements

Deployment UML diagram used for context of use of the profiler

Process Data UML diagram of the profiler DB

Definition of specific treatment or algorithm