INSTITUT MAX VON LAUE - PAUL LANGEVIN

NEUTRONS FOR SCIENCE ®

NOMAD – MORE THAN A SIMPLE SEQUENCER

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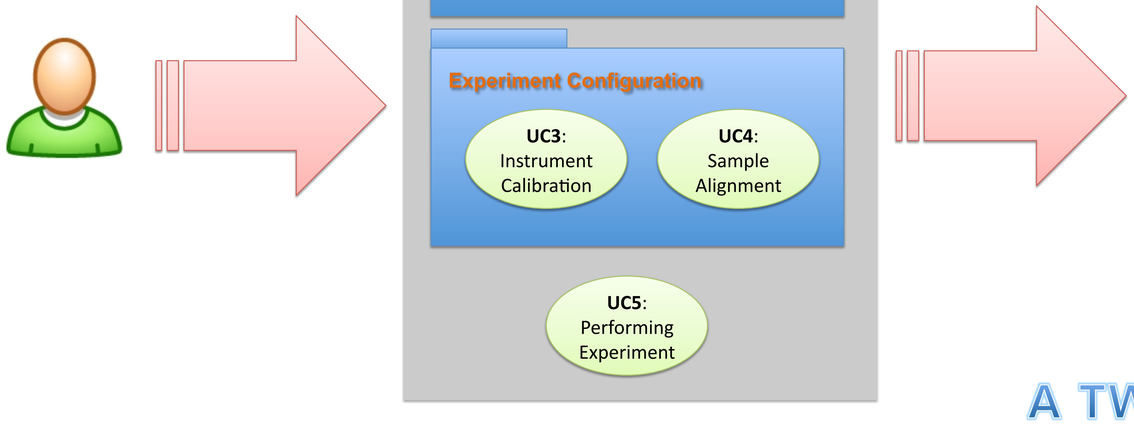
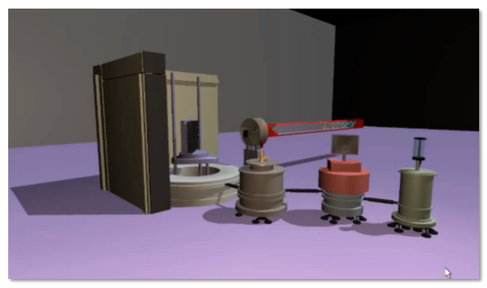
NOMAD USE-CASE

The Instrument Control Service of the Institut Laue-Langevin in close collaboration with the scientists responsible of the instrument suite, has taken up the challenge to redefine the way experiments are performed.



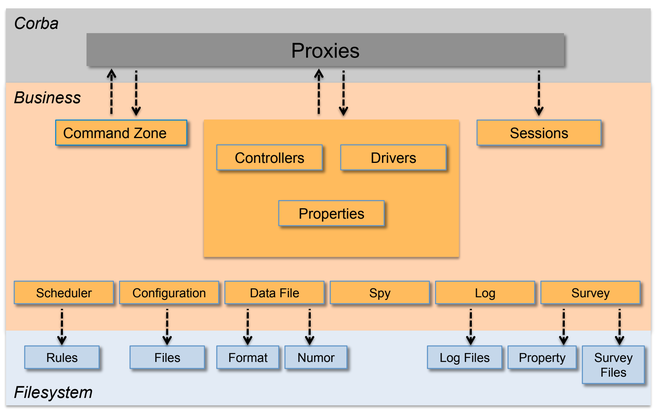


The interaction between the end user of the instrument and the set of hardware devices needed for the measurement has been described by mean of five main USE-CASE.

They depict the path to move from the initial setup of the instrument, performed in some cases by different actors, up to the final realisation of the experiment by the external users.

A TWO-TIER CLIENT-SERVER APPLICATION

THE C++ SERVER



Instrument Abstraction: to hide from the user the specific underlying hardware or control sequence. It provides an interface relevant to a specific function and then passes user requests to more specific instances.

The Nomad Server application is the part of the programme executing the main tasks required for the control of the instruments. The main components are:

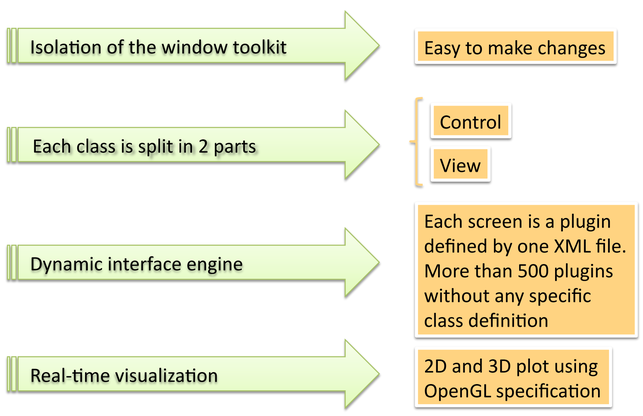
Plug-in container: to load, initialise and execute the business logic of the instrument. The business layer is organized into plug-ins separated into drivers (low level layer) and controllers (high-level layer).

Command sequencer: to process the requests of the client. Those can be complex sequences of instructions onto controllers.

CORBA: to make the connection between the C++ server and the Java client. It offers a flexible interoperability service through the definition of IDL interfaces and its implementations provide good performances in regard of other inter-application communication.

THE JAVA-SWT CLIENT

The Nomad Client is designed to offer a practical Graphical User Interface for the user to control the instrument. A dedicated effort has been made to provide an easy-to-use graphical programming of complex sequences of instructions. It consists of three different graphical views specifically designed to satisfy different needs:



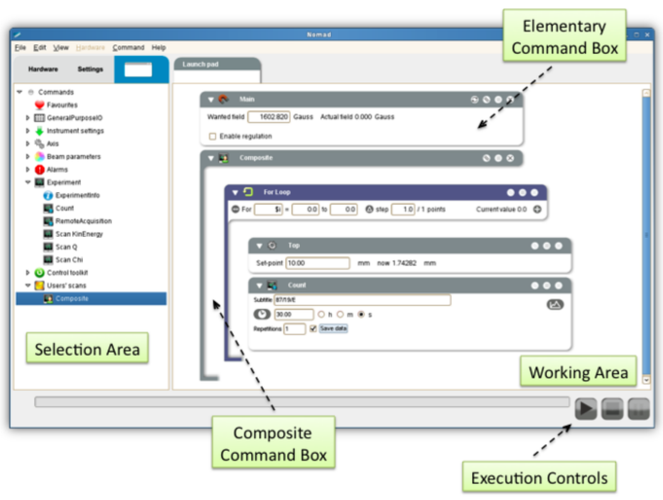
***Hardware* view** is intended for the technical support and gives access to all hardware specific parameters.

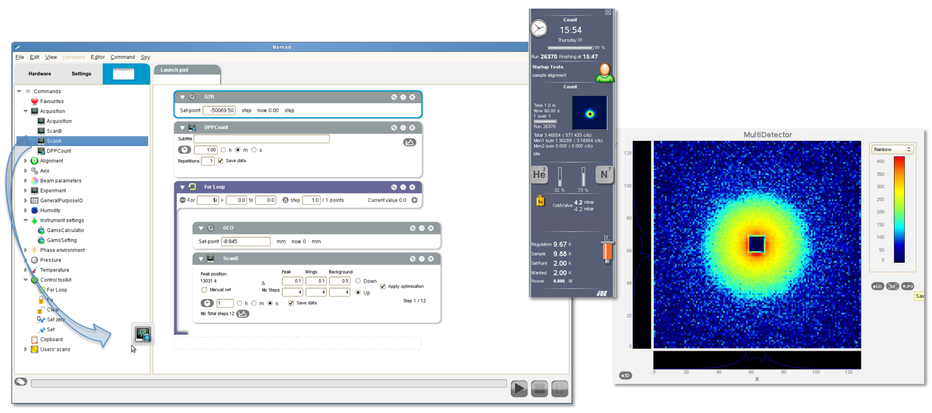
***Setting* view** is mainly devoted to instrument responsible and allows configuring higher-level controllers

Launch-Pad view permits the creation and the execution of a specific workflow. Parallel and background executions as well as *For-Loops* and *If-Else* statements are directly available.

DISCOVERING THE INTERFACE

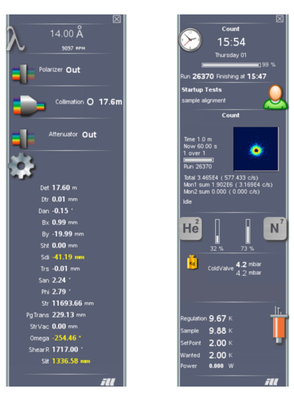
The main window of the interface is composed of a selection area (on the left) and a working area. Commands are dragged from the selection area and dropped into the working area. The execution control is placed on the bottom band with start/stop and pause buttons. A general progress bar shows the status of the execution. The selection area contains all the possible operations on the instrument like data acquisition, controls of sample environment and instrument settings (wave-length changes, Time-of-Flight parameters, special configurations, etc...).





DRAG-AND-DROP: A SIMPLE BUT POWERFUL TOOL

The user builds his work-flow by dragging and dropping elementary commands into the working area, moving, deleting and duplicating them. Each command has its own parameters and status. Once the command list is ready, the user launches the sequence by pressing start.



KEEP USER IN THE LOOP

Building a spy window is easy. Create first an empty drop zone and drag any item from the selection area. Special spies, like those for data acquisition, allow by clicking on the live data thumbnail to open the live display plotting window.

Items can be freely arranged inside the window or dragged into another spy window. The user could build a spy with hardware status and another with experiment status. The user may choose the level of detail displayed.

A web service is publishing every minute the status of each instrument and is accessible from your favorite browser at **http://nomad.ill.fr**