THE SOLARIS CONCEPTS FOR THE BEAMLINES CONTROL SYSTEMS

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An overview will be given of activities and decisions taken in relation to the IT and the control infrastructure. This includes current status, software and hardware choices, a computer network design [1] and services provided by the Solaris. A guideline for the beamlines control systems will be presented, too.

A control system and IT infrastructure for the Solaris machine is in design and development. The design will have impact on the beamlines design and operation. The control system for both the machine and beamlines should follow a standard to ensure it is cost effective, manageable and possible to maintain [2].

The TANGO [3] control system and its dedicated tools have been chosen for the integration layer. TANGO has been implemented at several laboratories in Europe and found to be both reliable and mature.

Each beamline should have an autonomous control system that is nonetheless capable to exchange data with the main machine control system and the IT infrastructure to the extent it is necessary for both the beamline and the storage ring being operated. This means that the beamline control system should have as low as possible impact on the other part of the facility and vice-versa.

The control system development will be developed by the control group provided with the necessary resources from the beamline budget. This approach ensures that knowledge used for the control system development will last at the facility and makes later maintenance feasible [2].

A typical beamline contains three major parts: an insertion device, a frontend to exit slit part, an end-station. Each of those requires different level of interaction between the machine control system and the beamline CS (CS = Control System):

- The insertion device is a part of the storage ring and it should be controlled by the machine CS. The Tango Device Server, along with necessary GUI should be provided and should be available in the control room. Beamline should have an access to this as a TANGO client.

- The frontend to exit slit part is more the beamline than the storage ring. However, it is connected to the machine and it should be possible to access it as a client from the machine CS. Additionally, it shall provide the interlock system integrated with the machine one. This is due to ensure the radiation safety and the vacuum safety.

- The end station is the solely part of the beamline. The only case it is necessary to make it direct communicate with the machine is if it provides any hazard to the ambient.

In addition to the above physical (horizontal) distinction, the control system could be regarded as four layers in a logical (vertical) plane:

- The hardware layer. It includes the physical equipment like mirrors, motors, vacuum valves etc.

- The local layer. It includes: acquisition/actuating electronics, the interlock PLC system and low level control equipment

- The integration layer. It consists of the Tango device servers, the Tango Host and the computer network.

- The Operator/Supervisory layer — GUI applications, the computational software, the archiving. The Tango standard applications and the Taurus [4] library will be used for the GUI applications, wherever possible. The Sardana [5] is a tool to be used for the experiments' sequencing.

References

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