Summer Student Programme - Project description

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Project ID	17683
Project content (%)	100/0/0 (Physics/Engineering/Computing)

Project proposal

Process Infrastructure Management Application for Data Processing Nodes.

The LHCb online system has roughly 1600 nodes partitioned into the High Level
Trigger- and various data monitoring sub-farms, where data processing applications execute. To ensure proper monitoring of the operating system, the data-taking activity and other processing related aspects, numerous supplementary processes are running on these nodes. Though a server process is present to ensure these processes are restarted e.g. on death, this server needs to be programmed on every reboot or restart.
The programming is node dependent ie. the processes to be started depend on the role of the node.
The student should investigate convenient mechanisms to edit the process content of a given node-type and to extract this information for display purposes or to program the above mentioned server process. For this purpose a data inventory must be designed (mini-database) and the corresponding applications should be provided.
These are firstly command line tools to edit and extract the process content given a given node name or node type. Secondly, if feasible within the time budget of the studentship, the implementation of a graphical editor can be investigated and started.
The work mainly consists of computing engineering work. A basic knowledge of
object oriented programming techniques and of the Python or C++ programming
languages is an advantage, but the necessary knowledge can also be acquired during the studentship.
The selected student will obtain insight in modern software design techniques and the implementation using object oriented programming languages. An understanding of the advantages and the disadvantages of the different design choices and the chosen programming language will be developed.

Training value

Insight in software design and implementation techniques

Computing knowledge

C++:Python

Computing knowledge (other)