

Optimizing DCS Real Time framework interfaces for WEST

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DCS (Discharge Control System) is the IPP C++ real-time framework for plasma control at ASDEX Upgrade. Since 2016, the 2011 version of DCS has been used routinely for WEST plasma control without any kind of major issue. However, some errors occur in the interfaces with the WEST CODAC Infrastructures. Although it is not a security issue (machine integrity and operator security are not at risk), the lack of reliability in the interfaces has had an important impact on operation time and machine availability. Moreover, technical collaboration was becoming hard because of the growing differences between codes.

After analysis, it appeared that the way DCS was originally adapted to fit the needs of WEST is too complex and different from the DCS way of working. Moreover, the specialized parts of the code which are exclusively used for WEST operation were not included in the evolution/maintenance process at IPP Garching and codes have inevitably diverged. To fix these problems, it was decided to review the specialization of DCS for WEST so that only standard DCS services (called “Application Processes”) are used. This way, it will be possible to use exactly the same version of DCS in both institutes and to specialize code only by parameters. Consequently, WEST will benefit immediately from all improvements made to DCS and WEST will be a practical test bench to further demonstrate DCS agility and reliability.

The paper describes the new architecture of the DCS WEST integration and, in the second part, the results we obtained. This paper will also stress on all the advantages of sharing code as well as a common practice of software development.

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