ENHANCED COMPUTATIONAL INFRASTRUCTURE FOR DATA ANALYSIS AT THE DIII–D NATIONAL FUSION FACILITY[*]

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Recently a number of enhancements to the computer hardware infrastructure have been implemented at the DIII–D National Fusion Facility. These enhancements include a 3 TB mass storage system for raw shot data composed of hard disks, a magneto–optical jukebox, and a DLT tape library. This system provides data access 24 hours a day, 7 days a week. A new switched 100 Mbit/s intranet has been deployed increasing network speed between computers and data storage devices as well as to the scientists' desktop. User files are shared among workstations using a Network Appliance F520 network data storage system with a capacity of 100 GB, a factor of three increase over previous storage capabilities.

Utilizing these improvements to the hardware infrastructure, software enhancements are focusing on streamlined analysis, automation, and GUI systems to enlarge the user base. The adoption of the load balancing software package LSF Suite by Platform Computing has dramatically increased the availability of CPU cycles and the efficiency of their use. Streamlined analysis has been aided by the adoption of the MDSplus system to provide a unified interface to analyzed DIII–D data. The amount of data stored in the MDSplus system continues to increase currently totaling 32 GB for 4300 shots. The majority of MDSplus data is made available in between pulses giving the researcher critical information before setting up the next pulse. Work on data viewing and analysis tools focuses on efficient graphical user interface (GUI) design with object oriented programming (OOP) for maximum code flexibility. The majority of our tools are written in IDL, a commercial software package for scientific data manipulation and visualization.

Work to enhance the computational infrastructure at DIII–D has included a significant effort to aid the remote collaborator since the DIII–D National Team consists of scientists drawn from 9 national laboratories, 19 foreign laboratories, 16 universities, and 5 industrial partnerships. This work can be summarized in that DIII–D data is available on a 24×7 basis from a set of viewing and analysis tools that can be run either on the collaborators' or DIII–D's computer systems. Additionally, a Web based data and code documentation system has been created to aid the novice and expert user alike. This paper will provide an overview of the software enhancements implemented since the last conference.