

MDSplus Performance Testing at DIII-D*

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Personnel at the DIII-D National Fusion Facility are investigating the use of distributed computing technologies to make efficient use of existing resources and to cheaply provide increased computing power. Concomitant to distributed computation is distributed data management: how data is to be stored, transferred, and made secure in a distributed computing environment. Recent improvements to the MDSplus scientific data management system have added a new distributed capability as well as new security features. A number of DIII-D staff are researching the performance implications of these new features. It is anticipated that with the right system configuration, this new distributed capability will result in better load balancing between clients and servers, and more efficient use of network resources resulting in improved support of the data analysis needs of the scientific staff.

Much of the opportunity for increased network efficiency comes from the increased computing power of new network hosts. Because new computers have fast processors, they can easily make use of compression technologies to reduce data sent over the network. For example, it is more efficient to send compressed data over the network than to send uncompressed data, but this is only possible if the client has sufficient computational power to decompress the data without negatively impacting system performance. Good use of compression will be critical for managing the increasing amounts of experimental data generated by new digitizers and simulation data generated by modern codes.

This paper will present the effects of different system and database parameters on MDSplus performance. Examples of this are differing levels of system load, RAM, RAMdisk and memory configurations, and various client configurations. Based on these findings, the paper will present the best system and database configuration for the current generation of hardware and distributed computing systems.

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