Customizable Scientific Web Portal for Fusion Research*

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The Web browser has become one of the major application interfaces for remotely participating in scientific experiments such as those in magnetic fusion. Recently in other areas, web portals have begun to be deployed. These portals are used to present very diverse sources of information in a unified way. While a web portal has several benefits over other software interfaces, such as providing single point of access for multiple computational services, and eliminating the need for client software installation, the design and development of a web portal has unique challenges. One of the challenges is that a web portal needs to be fast and interactive despite a high volume of tools and information that it presents. Another challenge is the visual output on the web portal often is overwhelming due to the high volume of data generated by complex scientific instruments and experiments; therefore the applications and information should be customizable depending on the needs of users. An appropriate software architecture and web technologies can meet these problems.

A web-portal has been designed to support the experimental activities of DIII-D researchers worldwide. It utilizes a multi-tier software architecture, and web2.0 technologies, such as AJAX, Django, and Memcached, to develop a highly-interactive and customizable user interface. It offers a customizable interface with personalized page layouts and list of services for users to select. The users can create a unique personalized working environment to fit their own needs and interests. Customizable services are: real-time experiment status monitoring, diagnostic data access, interactive data visualization. The web-portal also supports interactive collaborations by providing collaborative logbook, shared visualization and online instant messaging services. Furthermore, the web portal will provide a mechanism to allow users to create their own applications on the web portal as well as bridging capabilities to external applications such as Twitter and other social networks.

In this paper, we will describe the software architecture of this scientific web portal and our experiences in utilizing web2.0 technologies. A live demonstration of the system also will be presented as well as user feedback from the 2009 DIII-D Experimental Campaign.

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