

Grid computing and collaboration technology in support of fusion energy sciences

D.P. Schissel

General Atomics, P.O. Box 85608, San Diego, California 92186-5608

Contact Author: D.P. Schissel, General Atomics, P.O. Box 85608, San Diego, California 92186-5608, Phone: (858) 455-3387, Fax: (858) 455-3586 email: schissel@fusion.gat.com

Received (

Abstract. Science research in general and magnetic fusion research in particular continue to grow in size and complexity resulting in a concurrent growth in collaborations between experimental sites and laboratories worldwide. The simultaneous increase in wide area network speeds has made it practical to envision distributed working environments that are as productive as traditionally collocated work. In computing power, it has become reasonable to decouple production and consumption resulting in the ability to construct computing grids in a similar manner as the electrical power grid. Grid computing, the secure integration of computer systems over high speed networks to provide on-demand access to data analysis capabilities and related functions, is being deployed as an alternative to traditional resource sharing among institutions. For human interaction, advanced collaborative environments are being researched and deployed to have distributed group work that is as productive as traditional meetings. The DOE SciDAC initiative has sponsored several Collaboratory Projects, including the National Fusion Collaboratory Project, to utilize recent advances in grid computing and advanced collaborative environments to further research in several specific scientific domains. For

fusion, the collaborative technology being deployed is being used in present day research and is also scalable to future research, in particular to the ITER experiment that will require extensive collaboration capability worldwide. This paper briefly reviews the concepts of grid computing and advanced collaborative environments and gives specific examples of how these technologies are being in fusion research today.