

# Grid Small and Large: Distributed Systems and Global Communities (ICSE 2004 Linkages Track Presentation)

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Grid technologies seek to enable collaborative problem solving and resource sharing within distributed, multi-organizational “virtual organizations” [3, 5]. Two characteristics of Grid environments make the engineering of systems and applications particularly challenging. First, we face the familiar difficulties that arise when developing software that must provide reliability, performance, and security in environments that may be heterogeneous, unpredictable, unreliable, and hostile ; second, we must allow this software to be deployed, operated, and evolved in an environment characterized by multiple participants with different and perhaps conflicting views on system function and design.

I present work that is being done to address these challenges. I speak first to “Grid in the small,” and describe the Open Grid Services Architecture (OGSA), an effort that is defining standard Grid protocols layered on Web Services [4]. I explain the relationship of OGSA to Web Services, the recent evolution of OGSA to better exploit emerging Web Services standards [2], the requirements Grid is placing on Web Services standards, and the landscape of protocols that are being defined upon Web Services to meet Grid requirements.

I then turn to problems associated with “Grids in the large” and discuss how Grid technologies need to evolve to address the challenges associated with community development of complex software systems and other forms of collaborative work. I illustrate this discussion with examples from communities such as earthquake engineers, high energy physicists, and biologists who have been early adopters of Grid technologies, via deployments such as NEEsgrid [7], Grid2003 [8], TeraGrid [1], and MyGrid [6].

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