New Directions in Grid Technologies

Ian Foster, Argonne National Laboratory and University of Chicago, USA

Abstract:

In both *e*-business and *e*-science, we often need to integrate services across distributed, heterogeneous, dynamic "virtual organisations" formed from the disparate resources within a single enterprise and/or via external resource sharing and service provider relationships. This integration can be technically challenging due to the need to achieve various qualities of service when running on top of different native platforms. We present an Open Grid Services Architecture that addresses these challenges. Building on concepts and technologies from the Grid and Web services communities, this architecture defines a uniform exposed service semantics (the Grid service), defines standard mechanisms for creating and discovering transient Grid service instances, provides location transparency and multiple binding protocols for service instances and supports mapping services for integration with underlying native platform facilities. The Open Grid Service Architecture defines, in terms of Web Services Description Language interfaces, mechanisms required for creating and composing sophisticated distributed systems, including lifetime management, reliable remote invocation, change management, credential management and notification. Our presentation describes how Globus Toolkit mechanisms can be used to implement a service-oriented architecture, explains how Grid functionality can be incorporated into a Web services framework and illustrates how our architecture can be applied within commercial computing as a basis for distributed system integration - within and across organisational domains.