

Grid Application Design

Using Software Components and Web Services

Dennis Gannon

Indiana University
Bloomington, Indiana

Abstract. Software Component systems are widely used in the commercial world for designing desktop applications and multi-tier business systems. They have not been widely used in large scale scientific computation. However, as our computing platform has evolved into Grid systems, a distributed component architecture is gaining support as a programming model for building heterogeneous, wide-area application. There are several interesting Grid component architectures that are currently being used. Some are derived from the Corba component model and others are based on EJB or other object systems. The DOE CCTTSS organization has developed a model that supports parallel applications as well as distributed computation called CCA. Components in CCA are defined by public interfaces called “ports” which define the endpoints in the communication channels that link an application’s components together.

Over the past year a number of companies have defined another approach to designing distributed application based on a concept called “Web Services.” A Web Service is a process that provides a network-accessible interface of “services” that is described by an XML specification called WSDL (Web Services Description Language). The Grid Forum is currently working on several projects which allow Grid services to be defined and accessed as webservices.

In this talk we will describe the simple duality that exists between component-based programming and web services. We will also discuss the difficult problems of integrating web services protocols like SOAP into high performance distributed systems.