Service-orientation, Web Services, and the Architectural Principles for building Internet-scale Applications

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Abstract

In this presentation we will discuss a principled approach to designing and implementing Internet-scale applications (a.k.a. Grid applications) using Web Services technologies and the tenets of service-orientation. We will focus on scalability, loose-coupling, organisation-to-organisation integration, and how these can be achieved using Web Services technologies.

There have been a lot of discussions and proposals on how to build Internet-scale applications. The Web Services Grid Application Framework (WS-GAF) was first introduced in August 2003 as a critique of the Open Grid Services Infrastructure (OGSI) and a description of how existing Web Services technologies could be used to realise the Open Grid Services Architecture (OGSA). The rationale for introducing WS-GAF has now been adopted by the UK e-Science Program as the recommended approach for the emerging UK e-Science national infrastructure. The motivation and approach taken by WS-GAF will be presented.

We also present MEST (MESsage Transfer), a set of architectural principles for building Web Services that fulfills the same role as REST does for the World Wide Web.

In order to investigate and demonstrate the validity of the WS-GAF and MEST approaches, we have been building "typical" Grid applications in this way. One such application, scientific in nature, is used to search for White Dwarfs in our galaxy by extracting and processing data from large scientific archives including the SuperCOSMOS Scientific Archive and the Sloan Digital Sky Survey (screenshots below).