Service-Based Distributed Querying on the Grid

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Abstract. Service-based approaches (such as Web Services and the Open Grid Services Architecture) have gained considerable attention recently for supporting distributed application development in e-business and e-science. The emergence of a service-oriented view of hardware and software resources raises the question as to how database management systems and technologies can best be deployed or adapted for use in such an environment. This paper explores one aspect of service-based computing and data management, viz., how to integrate query processing technology with a service-based Grid. The paper describes in detail the design and implementation of a service-based distributed query processor for the Grid. The query processor is service-based in two orthogonal senses: firstly, it supports querying over data storage and analysis resources that are made available as services, and, secondly, its internal architecture factors out as services the functionalities related to the construction of distributed query plans on the one hand, and to their execution over the Grid on the other. The resulting system both provides a declarative approach to service orchestration in the Grid, and demonstrates how query processing can benefit from dynamic access to computational resources on the Grid.