A Framework for Efficient Query Answering on Semantically Heterogeneous Grids

Juan Li1*, Ying Su2

1 Computer Science Department, North Dakota State University, USA
J.Li@ndsu.edu
2 Computer Science Department, University of British Columbia, Canada
yingsu@cs.ubc.ca

Abstract. With the rapid growth of grid computing, more and more data are generated and stored across the grid. To fully utilize the data, efficient data search and query answering mechanism is becoming a very important issue. However, the sheer amount of data and their heterogeneity nature pose challenges that current technology cannot cope with efficiently. In this paper, we propose an efficient query answering solution that integrates topology adaptation, semantic query routing, and view-based caching techniques to reduce bandwidth cost of distributed query processing while allowing efficient evaluation of complex semantic queries over large-scale, fully decentralized, and semantically heterogeneous grids. Simulated experimentations illustrate that our comprehensive query strategies effectively reduce the cost of query evaluation and improves the query performance.

Keywords: Grid computing, query evaluation, routing, semantics, ontology.

1 Introduction

The grid is a distributed computing infrastructure that enables coordinated resource sharing within Virtual Organizations (VO) [12] consisting of individuals, institutions, and resources. Nowadays,