Federation in Cloud Data Management: Challenges and Opportunities

Abstract:

Companies are increasingly moving their data processing to the cloud, for reasons of cost, scalability, and convenience, among others. However, hosting multiple applications and storage systems on the same cloud introduces resource sharing and heterogeneous data processing challenges due to the variety of resource usage patterns employed, the variety of data types stored, and the variety of query interfaces presented by those systems. Furthermore, real clouds are never perfectly symmetric—there often are differences between individual processors in their capabilities and connectivity. In this paper, we introduce a federation framework to manage such heterogeneous clouds. We then use this framework to discuss several challenges and their potential solutions.