Managing big RDF data in clouds: Challenges, opportunities, and solutions

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ABSTRACT

The expansion of the services of the Semantic Web and the evolution of cloud computing technologies have significantly enhanced the capability of preserving and publishing information in standard open web formats, such that data can be both human-readable and machine-processable. This situation meets the challenge in the current big data era to effectively store, retrieve, and analyze resource description framework (RDF) data in swarms. This paper presents an overview of the existing challenges, evolving opportunities, and current developments towards managing big RDF data in clouds and provides guidance and substantial lessons learned from research in big data management. In particular, it highlights the basic principles of RDF data management, which allow researchers to know the most recent stage in developing RDF graphs and its achievement. Additionally, the research provides comparative studies among current storage systems and query processing approaches in understanding their efficiency. The paper also provides a vision for long-term future research directions by providing highlights on future challenges and opportunities in RDF domain.

KEYWORDS:

Semantic Web; Cloud computing; RDF graphs; Linked data; Big data