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CPSE-Bio: 基于云计算的生物问题求解环境

谢江, 王旻超, 易荣贵, 夏上云, 张武

上海大学计算机工程与科学学院, 上海200444

CPSE-Bio: A Cloud-Based Biological Problem Solving Environment

XIE Jiang, WANG Min-chao, YI Rong-gui, XIA Shang-yun, ZHANG Wu

School of Compute Engineering and Science, Shanghai University, Shanghai 200444, China

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摘要 生物信息学是结合计算机技术解决生物问题, 利用计算机能力加速生物研究的交叉性学科. 问题求解环境(problem solving environment, PSE)是一类面向科学问题求解的计算平台, 研究人员通过使用PSE可以高效地参与和开展科学研究. 由于生物数据规模通常很大, 而这些数据随着生物技术的发展仍在不断地增加, 因此, 传统单机单系统PSE已无法满足生物计算需求. 介绍上海大学计算机工程与科学学院高性能计算研究所生物信息学研究团队将云计算技术与PSE相结合, 实现基于云环境的问题求解环境CPSE-Bio, 并对其中2个代表性模块, 即PPI(protein-protein interaction)多数据库网络查询(multi-database retrieval technology, MDRT)模块和蛋白质挖掘(protein mining, PM)模块, 进行性能分析和比较.

关键词: 生物信息学   问题求解环境   云计算

Abstract： Bioinformatics is an interdisciplinary subject which combines biology with computer science to address biological problems. The purpose of problem solving environment (PSE) is to solve scientific problems and provide an effective platform for researchers. As the scale of biological data is huge and data increase rapidly with the development of the biology technology, it is hard for the traditional PSE based on a sequential computer system to meet the processing emand. This paper reviews the work of the Bioinformatics Group at the School of Computer Engineering and Science, Shanghai University. PSE with the cloud technology and implement a bioinformatics PSE named CPSE-Bio, based on cloud computing are combined. The performances of two main modules in the CPSEBio, multi-database retrieval technology (MDRT) and protein mining (PM), are evaluated and analyzed.

Keywords： bioinformatics,   problem solving environment (PSE),   cloud computing

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