

面向用户任务与云资源匹配度的调度算法研究

聂清彬^{1,2}, 霍敏霞¹, 曹耀钦¹

(1 重庆邮电大学 移通学院, 重庆 合川 401520; 2. 四川大学 锦江学院, 四川 眉山 620860)

摘要: 为了提高任务在云环境中的执行效率, 提出一种基于任务资源匹配度函数和的成本函数的改进蚁群算法(an advanced Matching function of Task Resource and Cost in Ant Colony Optimization, MTRCACO), 在综合参考各种最新蚁群算法的基础上, 创新地通过任务与资源匹配度函数来改进信息素中的启发信息, 并通过成本函数降低云计算中心的负载不均衡度, 使虚拟机通过多次算法迭代以后能够处于一种负载均衡的状态, 利用 CloudSim 工具进行仿真测试, 实验结果表明 MTRCACO 算法在任务的执行成本以及系统负载均衡方面均优于 IPSO 算法和 BACO 算法, 提高了资源的利用率.

关键词: 云计算; 匹配函数; 蚁群算法; 任务调度; 负载均衡

The Research of Scheduling Algorithm Faced to the Matching Degree of User's Task and Cloud Resource

NIE Qing-bin^{1,2}, HUO Min-xia¹, CAO Yao-qin¹

(1 College of Mobile Communication, Chongqing University of Posts and Telecom, Chongqing 401520, China;

2 Jinjiang College, Sichuan University, Meishan 620860, China)

Abstract: To improve the execution efficiency of task in cloud environment, the Matching function of Task Resource and Cost Advanced Ant Colony Optimization (MTRCACO) is proposed. The MTRCACO improves inspiration information from information elements by making a comprehensive reference of the latest ant colony algorithms and adopting the matching function of task and resource. It also decreases the load unbalancing degree in cloud computing center by cost function, and simultaneously keeps the load balance of virtual machines by executing the tasks for many times. Some experiments are carried out on the CloudSim platform. The comparison shows this MTRCACO algorithm is more efficient than the algorithms IPSO and BACO in reducing task execution cost and in keeping system load balance, thus optimizes resource utilization.

Key words: cloud computing; matching function; ant colony algorithm; task allocation; load balancing

作者简介:

聂清彬 男, (1982-), 硕士, 讲师. 研究方向为云计算与物联网. E-mail: 270104318@qq.com.

霍敏霞 女, (1983-), 硕士, 讲师. 研究方向为软件测试.

曹耀钦 男, (1962-), 博士, 教授, 博士生导师. 研究方向为计算机网络.