

沈晴霓^{1,2}, 卿斯汉^{1,2,3}, 吴中海^{1,2}, 张力哲^{1,2}, 杨雅辉^{1,2}. 基于动态域划分的MapReduce安全冗余调度策略[J]. 通信学报, 2014, (1): 34~46

基于动态域划分的MapReduce安全冗余调度策略

Securely redundant scheduling policy for MapReduce based on dynamic domains partition

投稿时间: 2013-08-20

DOI: 10.3969/j.issn.1000-436x.2014.1.005

中文关键词: [云计算](#) [MapReduce框架](#) [动态域划分](#) [安全冗余调度](#)

英文关键词: [cloud computing](#) [MapReduce framework](#) [dynamic domain partition](#) [securely redundant scheduling](#)

基金项目: 国家自然科学基金资助项目(61232005, 61073156, 61070237, 61170282); 国家科技支撑计划基金资助项目(2008BAH33B02)

作者

单位

[沈晴霓^{1,2}](#), [卿斯汉^{1,2,3}](#), [吴中海^{1,2}](#), [张力哲^{1,2}](#), [杨雅辉^{1,2}](#)

[1. 北京大学 软件与微电子学院, 北京102600](#); [2. 北京大学 网络与软件安全保障教育部重点实验室, 北京100871](#); [3. 中国科学院 软件研究所, 北京 100190](#)

摘要点击次数: 159

全文下载次数: 40

中文摘要:

MapReduce现有调度策略无法实现云环境中多租户作业的安全隔离。提出一种基于动态域划分的安全冗余调度策略: 通过引入冲突关系、信任度、安全标签等概念, 建立一种动态域划分模型, 以将待调度节点划分为与不同租户作业关联的冲突域、可信域或调度域; 结合冗余方式, 将租户作业同时调度到其可信域节点和调度域节点(但不允许为其冲突域节点), 通过二者执行环境和部分计算结果的一致性验证决定是否重新调度。实验分析了其有效性和安全性。

英文摘要:

MapReduce's current scheduling policies could not ensure the isolation between multi-tenant Tasks in the cloud. A securely redundant scheduling policy based on dynamic domains partition was proposed. First, a kind of dynamic domain partition model was introduced in this policy. Based on the node's current belief, security labels with the conflict relationship between tenants, a computing node was partitioned into the conflict domain, trusted domain or schedulable domain in this model. Second, through redundantly computing, two copies of each Task were assigned respectively to its trusted domain node and its schedulable domain node (but not allow for its conflict domain node) in this policy. And the integrity of the two nodes' execution environments and the consistence of their results on a small part of original input data were verified. Accordingly, it decided whether the schedulable domain node was trusted. Finally, the performance and security analysis in the prototype show its effectiveness.

[查看全文](#) [查看/发表评论](#) [下载PDF阅读器](#)

关闭

版权所有: 《通信学报》

地址: 北京市丰台区成寿寺路11号邮电出版大厦8层814室 电话: 010-81055478, 81055479
81055480, 81055482 电子邮件: xuebao@ptpress.com.cn

技术支持: 北京勤云科技发展有限公司