

学术研究

面向OpenMP的混合检查点机制

黄 春+, 刘勇鹏, 杨学军

国防科技大学 计算机学院, 长沙 410073

收稿日期 修回日期 网络版发布日期 2007-7-30 接受日期

摘要 检查点/续算是软件容错的重要途径之一。论文描述了一个系统级和应用级混合的OpenMP检查点机制, 系统级支持不仅使检查点系统具有了好的透明性, 并且使共享数据的保存不再由主线程单独完成, 具有良好的数据局部性。应用级OpenMP协议将与OpenMP相关的协议处理独立出来, 提高了系统的可移植性。NPB3.2-OMP测试结果表明, 检查点和续算所需要的时间开销小, 能够满足大规模程序的实际需求。

关键词 [OpenMP](#) [检查点/续算](#) [系统级和应用级协同](#)

分类号

A new hybrid mechanism for Checkpoint/Restart in OpenMP programs

HUANG Chun+, LIU Yongpeng, YANG Xuejun

School of Computer, University of Defense Technology, Changsha 410073, China

Abstract

Checkpoint/Restart is one of the important approaches for software fault-tolerance. In this paper, the system-level and application-level coordinated Checkpoint/Restart mechanisms for OpenMP programs are presented. The system-level support is introduced for transparency, and it makes shared data saved by all threads together. The semantics-related operations of OpenMP will be separated from and hence independent of low-level systems by the application-level OpenMP checkpoint protocol, which improves portability of the checkpoint system. Based on the presented mechanism, a CCRG OpenMP Checkpoint/Restart system has been implemented. The experiments, such as NPB3.2-OMP, show the overhead of checkpointing and restarting is so limited that the system can be used in large scale programs.

Key words [OpenMP](#) [Checkpoint/Restart](#) [system-level and application-level coordinated](#)

DOI:

通讯作者 黄 春 [E-mail: chunhuang@nudt.edu.cn](mailto:chunhuang@nudt.edu.cn)

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