

学术探讨

## 分布式移动代理系统的异步死锁检测

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**摘要** 移动代理技术在为分布式应用提供全新的网络计算方式的同时也产生了传统分布式计算领域所没有的新的交互模式和执行模式。传统分布式计算的处理方法如并发控制和死锁检测方法不再适用于客户和服务提供者都可在网络中随处移动的移动代理系统。通过移动代理来建模长寿事务, 并根据移动代理的特点提出了一种异步分布式死锁检测和解除算法。它将事务代理的执行与死锁检测机制分离, 用专门的代理负责死锁检测的初始化、检测和消除等工作。死锁的检测通过创建若干检测代理, 使其在各个站点间移动来收集资源请求和分配信息, 并据此构造全局等待图; 通过分析和探测全局等待图中是否存在圈来完成。算法具有独立于网络的拓扑结构, 死锁的检测和事务代理的执行异步操作, 不对代理的移动性施加任何限制等特点。

**关键词** [移动代理](#) [分布式计算](#) [事务处理](#) [死锁检测](#)

分类号

## Asynchronous deadlock detection in distributed mobile agent system

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### Abstract

Mobile agents have unique properties and characteristics and provide a novel framework for building distributed applications but at the same time they also bring new interactive and execution modes for traditional distributed computing. Methods of existing concurrency control and deadlock avoidance algorithms for traditional distributed computing are not suited for environments when both clients and servers move freely through the network. In this paper, mobile agents are used to model long live transactions and a new asynchronous deadlock detection method is proposed. It separates executions between transaction agents and deadlock detection process, using dedicated agent to handle the initialization, detection and resolve of the deadlock process. By creating several deadlock detection agents and dispatching them to the other sites, the information for creating global waiting graph are gathered and by checking whether there exist cycle in the global waiting graph, the deadlock is detected. It has properties of topology independence, asynchronous operation and freedom of movement.

**Key words** [mobile agent](#) [distributed computing](#) [transaction processing](#) [deadlock detection](#)

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