一种基于分布式哈希表的混合对等发现算法

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Abstract

An application using a distributed hash table (DHT) with N nodes must choose a DHT protocol from the spectrum between O(1) lookup protocols and O(logN). However, various applications under different network churns require that an idea DHT would be adaptive in according with the churn rates. ROAD (routing on active and demand), a new lookup algorithm, adjusts itself to provide the best performance across a range of lookup delay and churn rates. The key challenges in the design of ROAD are the algorithms that construct the routing table's size and decrease the delay. It will speed up the lookup process and reduce the service delay with the expressed routing table and power sorting multicast algorithm. Simulations show that ROAD maintains an efficient lookup delay versus churn rate tradeoff than the existing DHTs. ROAD should be expanded into a mechanism that provides some kinds of lookup services with a range of qualities of service through super-peers choosing methods.

摘要

使用分布式哈希表(distributed hash table,简称DHT)的应用系统必须在O(1)发现算法和O(logN)发现算法系列中选择适应的DHT协议.但是,不同网络波动程度的应用场景要求理想的DHT协议根据网络波动率能够自适应地调整.提出一种发现算法ROAD(routing on active and demand),在延时和波动率之间自适应地调整以提供更好的性能.设计ROAD的关键挑战是构建路由表和降低延时的算法.通过构建加速路由表,加快发现服务的速度,降低消息转发的延时,并通过幂次序组播算法改善对超级点的依赖性.模拟实验显示,与现有DHT算法相比,ROAD维护了一种高效发现延时与波动率的折衷.选择不同质量类型的超级点,ROAD可以扩展成满足不同服务需要的发现机制.

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