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一种P2P环境下的VoD流媒体服务体系

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Abstract

Providing video on demand service over the Internet in a scalable way is a challenging problem. This paper proposes an architecture for video on demand streaming in peer-to-peer environment, in which each peer node has a fixed-size FIFO buffer to cache the most recent content of the video stream it receives and can provide service to subsequent reached proper peer nodes. It has the following properties: 1) it utilizes a distributed control protocol to support the joining and leaving processes of peer nodes in a scalable way; 2) it considers the issue of integrity of the received program in service recovering process of the interrupted nodes. Performance studies based on simulation are carried out, and the results show that the system architecture outperforms a recently proposed system architecture P2VoD in a number of important performance metrics such as the server's load, client join rejection probability, network resource usage ratio, program integrity ratio and so on.

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摘要

在Internet上提供大规模的VoD服务是一项具有挑战性的工作.提出了一种基于P2P(peer to peer)方法的VoD服务体系PeerVoD,它能够以较小的服务器代价实现大规模的VoD应用.PeerVoD中的每个节点均使用定长的FIFO缓存队列来保存其最近所接收到的数据,以便为后续到达的节点提供服务.它具有如下特点:1) 采用分布式控制协议以支持节点的加入和离开,系统具有良好的可扩展性;2) 服务被中断的节点在进行中断恢复时,考虑了节点对目标节目接收的完整性.仿真实验表明:同等条件下,PeerVoD体系在服务器负载、节点加入时被拒绝的概率、网络资源利用率以及节目完整性等性能指标上,均优于同类体系P2VoD.

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