论文

一种新的分布式QoS控制动态资源调配算法

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摘要
该文提出了一种新的分布式环境下用于QoS控制的基于模糊逻辑的动态资源调配(Fuzzy logic based Dynamic Resource Allocation，FDRA)算法。分布式环境采用集中式带宽代理(Bandwidth Brokers, BB))与分布式BB相结合的控制模式。分布式BB基于滑动窗口和滑动指针机制，在分配资源不足时向集中式BB请求追加资源，在占用资源高于需求一定阈值时滞后释放部分追加资源。追加资源块和释放资源块的大小分别由集中式BB和分布式BB根据当前网络负荷状态，采用模糊逻辑确定。模糊逻辑算法引入新的基于数据源特性的隶属度函数生成方法，提高决策的有效性。仿真结果证明，该文提出的算法性能优于已有文献的算法。

关键词　　分布式QoS控制　动态资源调配　模糊逻辑　滞后释放释放

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A New Dynamic Resource Allocation Algorithm for Distributed QoS Control

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Abstract
A new Fuzzy-logic based Dynamic Resource Allocation algorithm (FDRA) used for QoS control is proposed in this paper. In the hierarchically distributed architecture with multiple Bandwidth Brokers (BB), using sliding window and sliding pointer based mechanism, when the allocated resource is in short, a request is issued by the distributed BB to the centralized BB for additional resource. When the resource kept by a distributed BB is over the actual need to some extent, some allocated resource will be released with hysteresis. The size of additional allocated resource and released resource is determined by the centralized BB and the distributed BB respectively. The determination is concluded with a fuzzy logic algorithm taking into account of the current network load status. In order to improve the effectiveness of the decision, a new method of fuzzy mapping function generation is proposed, which is based on the statistical characteristics of the data sources. Simulation results show that the proposed algorithm is superior to the existing ones.

Key words　　Distributed QoS control　Dynamic resource allocation　Fuzzy logic　Resource release with hysteresis

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