

一种改进的反馈制两级交换结构FTSA-2-SS

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An Improved Feedback-based Two-stage Switch Architecture Using 2-staggered Symmetry Connection Pattern

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摘要

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摘要 基于反馈的两级交换结构FTSA (Feedback-based Two-stage Switch Architecture)在仿真中表现出极其优异的时延性能,但该结构对调度算法的时间限制使其理论性能无法实现。针对这一问题,该文基于2-错列对称的crossbar连接模式提出一种改进的反馈制两级交换结构FTSA-2-SS (FTSA using the 2-Staggered Symmetry connection pattern),应用该连接模式可使信元传输与调度算法并行工作,从而将算法的时域空间拓展到一个时槽。此外,该文还利用双信元缓冲模式和RB (Re-sequencing Buffer)来解决由此而带来的信元冲突和失序问题。理论分析表明FTSA-2-SS和FTSA具有相同的稳定性,仿真结果显示FTSA-2-SS的时延性能优于其他非反馈负载均衡结构。

关键词: 分组交换 负载均衡 反馈机制 2-错列对称 双信元缓冲模式

Abstract: Although the Feedback-based Two-stage Switch Architecture (FTSA) shows excellent performances in simulation, it can not be realized under present technology condition because of the time restrictions on the scheduling algorithms. To relax the time constraint of the FTSA, this paper proposed an improved two-stage switch architecture called FTSA-2-SS (FTSA using the 2-Staggered Symmetry connection pattern), which enables the cell transmission to take place in parallel with the scheduling process with the adoption of 2-staggered symmetry connection pattern and thus extends the time space of the scheduling algorithm to the whole time slot. In addition, FTSA-2-SS uses the double-cell-buffer mode and Re-sequencing Buffer (RB) to solve the consequent problem such as cell conflict and disordering. Theoretical analysis shows that FTSA-2-SS has the same stability as FTSA and the simulation results show that FTSA-2-SS has a better delay performance compared with the other non-feedback two-stage switch architecture.

Keywords: Packet switching Load balancing Feedback mechanism 2-staggered symmetry Double-cell-buffer mode

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