学术研究

无线网络中基于网络编码的自适应计时控制

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摘要　　将计时控制机制引入网络编码从而进一步提升它的性能。经研究发现当网络带宽充足的时候，通过等待额外的可执行网络编码的数据将增加编码数目，而同时引入的额外延迟不对系统吞吐量造成影响；当网络带宽不足时，系统延迟和吞吐量都将受到影响。提出了一种能量高效的自适应计时控制机制（adaptive energy-efficient timing control in wireless networks with network coding，AEETC）。该机制通过基于网络流量的情况自动调节自身行为来增加网络编码数量，从而减少能量的消耗。实验结果表明在网络负载较轻的条件下AEETC可以显著增加网络编码的数量，同时在端到端延迟、系统吞吐量和成功编码数量等指标上有很好的性能。

关键词　　无线网络　网络编码　能量高效　额外延迟　计时控制

分类号

Adaptive timing control in wireless networks with network coding

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Abstract

　Timing control is introduced into network coding to further enhance its performance. It is found that when bandwidth is sufficient，the extra delay introduced by waiting for additional data to perform network coding will increase the number of coding without affecting system throughput. Both delay and throughput suffers when bandwidth is insufficient. An adaptive energy-efficient timing control algorithm called AEETC （adaptive energy-efficient timing control in wireless networks with network coding） is proposed which can automatically adjust its behavior on the basis of the network traffic conditions. Simulation results demonstrate that AEETC increases network coding significantly for light network load and is able to provide good performance in terms of delay，throughput and the number of successful coding.

Key words　　wireless networks　network coding　energy-efficient；　extra delay　timing control

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扩展功能

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