一种基于多令牌桶的数据风暴抑制单元

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摘 要：为了避免网络中突发数据导致的交换机拥塞，提出了一种面向交换机数据风暴的预防机制.首先该机制以自适应的速率增加令牌桶内的令牌数，同时根据用户软件配置监控端口数据帧的类型，并根据其类型计算转发该数据帧所需的令牌数，最后对桶内的令牌数和数据帧转发所需的令牌数进行比较.当桶内的令牌数小于转发所需的令牌数时，启动交换机的流量控制；否则实现正常的数据转发.在实际工程应用中，通过多令牌桶的相互协同工作实现对以太网中多种数据类型的流量管理.仿真结果表明，所述机制基于多令牌桶技术可实现单播、组播及广播等多种数据风暴的抑制，满足项目应用要求.

关键词：数据风暴抑制；流量控制；交换网络拥塞；多令牌桶技术；以太网交换机

Data Storm Suppression Unit Based on Multi Token Bucket

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Abstract： In order to mitigate the switch congestion caused by bust data in the network, a preventive mechanism targeting for the data storm in switch is proposed. Firstly, it promotes the number of tokens in a token bucket with an adaptive rate, and simultaneously monitors the type of data frames from a port based on user software configuration. Then, the number of token required by forwarding that specific type data frame is calculated. Finally, the number of token in the token bucket and required by forwarding data frame is compared. Further, if the token amount in bucket is more than that required by data frame forwarding, the proposed mechanism permits data frame forwarding. Otherwise, the flow control is activated. In the realistic application, the collaborative work of multi-token is used to implement the flow control for multiple kinds of data frame. Simulation results show that the proposed mechanism, based on multi-token technique, can successfully suppress the data storm inducing by unicast, multicast and broadcast. All that can completely satisfy the project’s requirements.

Key words： data storm suppression; flow control; switch congestion; multi-token technique; Ethernet switch

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