

研究论文

一种改进的高速网络分布式流量抽样算法

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摘要:

针对基于掩码匹配的抽样算法中使用某些抽样掩码会造成较大测量误差的问题, 提出了一种增强样本随机性的改进方案. 该方案首先对标识字段进行异或运算, 以得到新的标识值; 然后再进行匹配抽样. 从理论上证明了异或运算能有效提高结果的随机性, 并用实测流量数据进行了统计验证. 最后, 从有效性和稳定性两个方面对改进算法进行了检验. 实验结果表明, 改进算法的各项评价指标均优于文献 [10] 算法, 任意的抽样掩码均能在改进算法中使用.

关键词: 分布式抽样 掩码匹配 标识字段 随机性 异或运算

Improved distributed traffic sampling algorithm for high speed network

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Abstract:

The sampling algorithm based on mask matching is a distributed sampling measurement technology which can be used in a high speed network. But there exists a problem that some masks used in the algorithm result in a large measurement error. In order to solve the problem, the paper proposes an improved scheme that aims to enhance the randomness of its sample. The idea of the scheme is to put the identification field into xor operation to get a new identity value before mask matching and sampling. Firstly, the paper demonstrates theoretically that the xor operation can enhance its computed result's randomness effectively. Then it is checked statistically with the realistic traffic data. Finally, the improved algorithm is tested from two aspects of effectiveness and stability. Experimental result shows that the evaluation indexes of the improved algorithm are better than those of the original algorithm. Hence, any sampling mask can be used in the improved algorithm.

Keywords: distributed sampling mask matching identification field randomness xor operation

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