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Internet网络的关联性研究

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Abstract

Network correlation plays a key role in the research of Internet topology. Current researches focus on the clustering, mixing and rich-club characteristics separately. This paper makes a deep study on the three network correlation characteristics. First, it points out the possible inconsistency between mean clustering and clustering coefficient, which are two main metrics for measuring the clustering characteristic. Then it shows that the local clustering coefficient is highly correlated with the nodes' degree. After a deep study of the PFP (positive-feedback preference) model, the intrinsic mechanism governing the rise of rich-club phenomenon is discovered and verified. The work is extended by exploring the relationships between these network correlation characteristics.

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摘要

网络的关联性在Internet网络拓扑的研究中具有重要作用.目前的研究分别集中于聚集特性、mixing特性和rich-club现象.深入研究了这3种网络关联特征:在指出刻画网络聚集特性的两个衡量参数——平均聚集系数与聚集系数可能存在不一致性的同时,发现AS(autonomous system)网络的局部聚集系数和节点度高度相关;揭示并验证了PFP(positive-feedback preference)模型中rich-club现象的内在形成机制.在此基础上,对这些网络关联特征之间的关联关系进行了研究.

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