

The Topology-Aware Ant Colony Optimization Algorithm based on Forest Growth for IPTV Live Service

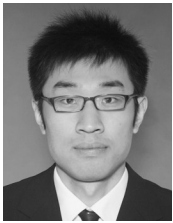
Congge Zhang*, Hua Wang*

**School of Computer Science and Technology, Shandong University, China*

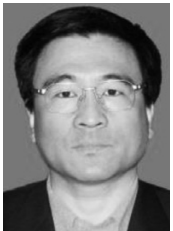
zhangcongge@mail.sdu.edu.cn, wanghua@sdu.edu.cn

Abstract—IPTV live service has strict requirements of QoS. IP Multicast is an effective technology, but the limited availability of IP Multicast in the Internet motives researchers to apply application-layer multicast to implement IPTV live service. In application-layer multicast, applications arrange themselves as a logical tree. The application-layer multicast for IPTV live service can be modeled as the minimum diameter, degree-bounded spanning tree (MDDBST) problem. However, application-layer multicast is a Peer-to-Peer (P2P) style. Applications don't have information of the underlying network topology and select distant peers, which generates much unnecessary traffic. Thus in the application-layer multicast for IPTV live service application-layer traffic optimization (ALTO) should be also considered. This paper proposes a Topology-aware Ant Colony Optimization algorithm based on Forest Growth (TACOF) which is mesh-first solution to solve the MDDBST problem considering ALTO. The results of a series of simulations show the effectiveness of the proposed solution.

Keywords—Ant Colony Optimization, Application-layer Multicast, Application-layer Traffic Optimization, QoS



Congge Zhang. Congge Zhang is a master student in the School of Computer Science and Technology of Shandong University in China. His research interests cover network algorithms and network simulation.



Hua Wang. Hua Wang is a professor in the School of Computer Science and Technology of Shandong University in China, where he leads the Network Optimization Research Group. His research interests include network optimization, network algorithms, network measurement, network architecture and protocol, and network simulation. His research has been supported by China Next Generation Internet Project, and NSF of China.