A New Path Probing Strategy for Inter-domain Multicast Routing

António Costa
Departamento de Informática
Universidade do Minho
Campus de Gualtar
4710 Braga, Portugal
Email: costa@di.uminho.pt

Vasco Freitas
Departamento de Informática
Universidade do Minho
Campus de Gualtar
4710 Braga, Portugal
Email: vf@di.uminho.pt

Abstract— Many already in use applications require the provision of QoS services from the underlying network infra-structure. This is particularly true for multicast, since it involves many participants at very sparse locations usually aiming to receive or send multimedia real-time streams. One way to provide QoS is through routing, since QoS aware multicast routing protocolos can find feasible multicast trees.

At large scale, scalability issues make the QoS multicast routing task a lot more difficult, since it is not possible to have a complete knowledge of the network topology and its path QoS metrics in a clear up-to-date way. The most promising proposals are therefore based on path probing strategies that evaluate a subset of the available connecting paths.

Assuming that each member can express its requirements as a combination of QoS metrics like available bandwidth, end-to-end loss probability and delay, it is up to QoS routing multicast protocols to build distribution trees connecting members through paths that can satisfy those requirements.

In this paper an inter-domain QoS multicast routing protocol is presented, specifically designed for the hierarchical inter-domain scenario, where requirements like intra-domain independency and policy awareness should be met. Emphasis is given to the path probing mechanism used to connect new members to the multicast tree, stressing how it differs from others.

Simulation results show that despite using a less aggressive and simplified probing mechanism - more suitable for inter-domain scenarios - the proposed routing strategy can build multicast trees with metrics similar to those build by more aggressive technics, with considerable less effort.