

Design and Evaluation of a Multi-Class Based Multicast Routing Protocol

Maria João Nicolau¹ and Alexandre Santos²

¹ Departamento de Sistemas de Informação,
Universidade do Minho, Campus de Azurém,
4800 Guimarães, Portugal
joao@uminho.pt

² Departamento de Informática,
Universidade do Minho, Campus de Gualtar,
4710 Braga, Portugal
alex@uminho.pt

Abstract. Most of current multicast QoS routing proposals are based on the principle that QoS routes must be computed for each request, where requests explicitly express their resource requirements. As a result, with this environment, the goal of QoS routing is to satisfy individual request requirements, resorting to resource reservation to maintain those requirements after a feasible path has been found.

This type of strategy is suited within the IntServ model but does not seem adequate in presence of DiffServ networks. According to DiffServ model, traffic flows are aggregated into specific classes-of-service and each flow receives a specific treatment accordingly to its class-of-service. There are no per flow guarantees, only per class differentiation. In this environment instead of per flow path computation, per class path calculation should be made, and so, within multicast scenarios, multiple multicast trees must be computed in order to satisfy different QoS requirements of different traffic classes.

This paper presents a new multicast routing protocol enabling per class multicast tree computation. The proposed heuristics enable directed trees establishment, instead of reverse path ones, due to the importance of link asymmetry within an environment which is, essentially, unidirectional. The proposed protocol is implemented and simulated using Network Simulator. A set of simulation results are presented, analyzed and compared against PIM-SM, a widely deployed multicast routing protocol.