Assignment #5 Proposal

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We are proposing a project idea based off of suggestion #3: multicast routing using reverse path forwarding and pruning. In my project, we would like to implement a reverse path forwarding + pruning version of the protocol as well as one that uses a center-based tree approach. It has been well- established that reverse path forwarding protocols perform well in very dense multicast networks. However, in many cases, multicast is used to connect a handful of possibly very distant nodes, meaning that reverse path forwarding wastes a lot of time and overall network bandwidth. Center-based trees perform far better in these instances, though they might have suboptimal latencies.

We want to inspect the nuances of these two implementations in more detail, however. What combinations of densities and topologies mean one performs better than the other? What is the point at which RPF and CBT perform about equally? Finally, will we be able to use my findings to mix the two together, creating a fusion implementation that can, with a good degree of certainty, choose the algorithm which will perform best on a given network? To explore these questions, we will measure both the average total network bandwidth and average latency of both RPF and CBT for a wide variety of small network topologies and densities (12 nodes or fewer).

References

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[3] Yuan-Cheng Lai, Ying-Dar Lin, Wei-Che Yu, and Yuh-Tay Lin. A modified version of distance vector multicast routing protocol. In Sixth International Conference on Computer Communications and Networks, pages 65 – 68, September 1997.