

# 1 Review

This paper proposes an architecture where end-systems implement multicast functionalities and show that it performs close to performance behavior of IP Multicast. IP Multicast has several issues like scaling constraints as routers maintain per group state, complexity in providing support for higher level features like congestion control, reliability etc; and deployment issues due to required changes at infrastructure level. This paper addresses these issues of IP multicast as end-systems maintain the state, and support high level functionalities by leveraging unicast solutions. Further performance criteria varies from application to application, so in that respect this architecture enables end-systems to meet application-level performance criteria.

The paper proposes Narada protocol. First it constructs a richer connected graph called as /emphmesh and then second, it constructs single source spanning trees using well known routing algorithms. Then, the paper describes the algorithms that Narmada uses to keep the mesh connectivity as members join and leave group. Then it describes techniques to incrementally improve the performance of mesh quality by adding and dropping of overlay links. The behaviour of overlay links vary dynamically and Narmada can adapt to it. Members periodically probe other members at random, and new link is added if utility gain of adding a link is greater than a threshold. Similarly, members monitor link and if *consensus cost* of dropping a link is less than a threshold, link is dropped. Stability of mesh and avoidance of partition are addressed by the proposed heuristic. Finally, single source spanning trees are constructed for optimizing given application level performance metric.

The paper evaluates the performance of Narada protocol using simulation and experimental evaluation and observe that it performs close to IP multicast. However, some issues needs to be addressed regarding a)scalability of the approach, as each member keeps maintains information regarding all other members of the group b)performance behavior with large group size, since increase in delay can be potentially significant in larger groups as compared to smaller groups and c) the overhead of this approach which can effect performance of short lived applications.