

## ABSTRACT

*During the time, there have been tremendous efforts to provide multicast service. IP Multicast is one of them, but widely deployed on the Internet had not been done yet, this is due to the lack of a scalable inter-domain routing protocol, the lack of support in access control, the requirement of global deployment of multicast-capable IP routers, and the lack of appropriate pricing models. Application layer multicast and multicast overlay represent the conducive new mechanism process the multicast in the Internet.*

*The existing protocol multicast overlay more focused to service multicast for the single of application or an single group and do not consider the fault-tolerance. This research proposes architecture of multicast overlay with addition of dual tree protection scheme which is named Multicast Overlay Scalable (MOS).*

*Compared with cost of unicast, MOS tree can reduce cost about 57.68%. MOS tree yield average LS lower than ALM tree which is between 1.1403 and 1.2352. Average PL of MOS tree shorter than ALM tree (at group size 40, average PL MOS tree equal to 13.35 while average PL ALM tree equal to 21.8). Control overhead of MOS is significant less than ALM for large group size. About 70-90% of control overhead can be reduced even when  $b_m$  is 0.*

**Keywords:** IP multicast, application layer multicast, multicast overlay, dual tree protection