Jittapat Bunnag

A Comparison of Overlay Routing and Multihoming Route Control

Summary:

The paper compared multihoming route control to overlay routing in three aspects: round trip time (RTT), throughput, and availability (resilience.) The result confirmed previous work that overlay routing superior to ordinary network using (Border Gateway Protocol) BGP in every feature. The multihoming with more than three access routes, however, has comparable performance with overlay without modifying the BGP. The paper ascribed the better RTT to overlay's ability to select shorter pathes. The paper also investigated and compared four scenarios: normal network (1-multihome), 1-overlay, k-multihome, and k-overlay (combination of k-multihome and overlay) and found the aforementioned result.

Contribution:

The paper demonstrated well-organized test-bed design; although, there exist some shortcomings (explained in next section). The methodology in the paper was scrupulous. The nodes in experiment were selected from many different regions and tiers. The data collection was so careful that the dubious traffic behavior could be discarded. This paper is a very good example of how to do network research experiment on actual Internet network.

Improvement/Drawback:

Although the number and geographic distribution of nodes in the study are conscientiously planned, these nodes are limitedly located in US. The international Internet traffic characteristic maybe differs from the US counterpart and might yield dissimilar results (example in next section.) In addition there many unrealistic assumptions such as instantaneous information of performance and availability of routes via each of ISP and inbound packet control. Finally, the paper admitted that the availability measurement was too coarse.

Relevance:

The paper suggests that the normal BGP network, even though inferior to overlay routing, could have better performance by implementing novel idea like multihoming route control. The future work should examine the performance of multihoming route control on very congested links since overlay routing could avoid the routes with heavily congested links but less number of hops while multihoming could not. This situation possibly makes multihoming route control dramatically poor performance (compare to overlay); for instance, it maybe better to connect to Southeast Asia countries via European continent than to do so via transpacific link. (I have not traceroute for such circumstance yet.) Finally, the algorithm to utilize all multihome links simultaneously is needed to create rapid acceptance of multihome route control.