All-path: Finding Simply Fastest Path and Balancing Load by Flooding ARP Packets as Path Probes

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ABSTRACT

Shortest path bridging overcomes the limitations of the spanning tree protocol in switched networks. Dominant approaches like Shortest Path Bridges (IEEE 802.1aq) and TRILL (IETF) Rbridges add a link state routing protocol in layer two to compute shortest paths between bridges, but these paths are shared by multiple hosts. Balancing the load at links requires complex equal cost multipath computations. It is simpler instead to find a path between every pair of hosts just-in-time, flooding the standard ARP Request frame through all links, snooping it at bridges with a new port-locking mechanism that associates the source address of frame to the first-arrival port and locks this association for some time, discarding duplicated packets received via other ports just by its source address. It scales to networks of tens of thousands of hosts. Link failures affect only to paths using them. It provides high throughput, low latency and automatic load distribution in campus and data center networks. This paper references the recent work, "ARP Path: ARP-based Shortest Path Bridges" [1] [2]

BODY

To select the fastest path in network, start a race of ARP Request replicas at the edge bridge and lock it with first-arrival port learning

REFERENCES

[1] G. Ibanez et al. ARP Path: ARP-based shortest path bridges. IEEE Communication Letters. July 2011.

[2] All-path bridges.
http://www.ieee802.org/1/files/public/docs2011/new-ibanez-All-Path-bridges-0511-v01.pdf.