



Universidad
de Alcalá



ARP-PATH SHORTEST PATH BRIDGES (FASTPATH ETHERNET TRANSPARENT BRIDGES)

TECHNOLOGY OFFER

Code

TIC_UAH_05

Application areas

- Information and Communication Technologies



Type of collaboration

- Interested in companies or institutions to conform a consortium for a project proposal to make it the system real
- License agreement
- Technical cooperation
- Joint venture agreement

Main researches

Dr. Guillermo Ibáñez Fernández

CONTACT



OTRI Universidad de Alcalá
Escuela Politécnica Superior
Campus Científico-Tecnológico
28805, Alcalá de Henares
(Madrid)
(+34) 91 885 45 61
otriuah@uah.es

@otriuah

OTRI Universidad de Alcalá

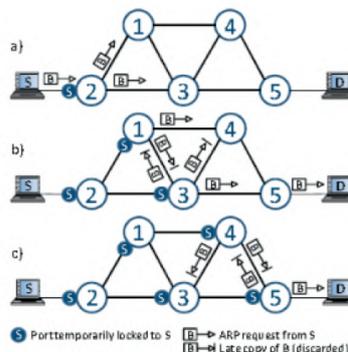


Figure 1. FastPath discovery from host S to host D

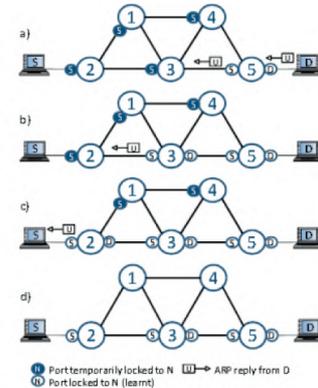


Figure 2. FastPath confirmation from host D to host S

ABSTRACT

Fastpath (also known as ARP-Path) is a radical departure from this approach. It is a natural evolution of the transparent bridge paradigm to implement near shortest path bridging (or strictly shortest, depending on the loop prevention mechanism). Instead of interchanging topology information, short unicast paths and source rooted multicast trees are built directly in the data plane without any ancillary routing protocol, just by controlled flooding (to bridges or to hosts) of an on demand or periodically broadcasted beacon frame. The fastest unicast path in transmission direction, among the paths permitted by the loop prevention mechanism, gets selected at every bridge. This path is then confirmed as a bidirectional, symmetric path, after reception of the unicast reply frame from the destination host or bridge(s). In this way, unicast paths and/or source rooted spanning trees are set up directly in the data plane.

The proposed FastpathUD protocol prevents loops by enforcing a simple and limited prohibition of some turns of frames at bridges (down-up turns only, around one fifth of the total possible turns), instead of the full link prohibition applied by the spanning tree protocol. Throughput is close to that of shortest path protocols. Alternative mechanisms for loop prevention may be used to attain full shortest paths performance.

The resulting architecture requires zero-configuration, uses standard Ethernet frame format, relies on standard Rapid Spanning Tree Protocol, is fully transparent to hosts with or without frame encapsulation, and compatible with 802.1D bridges in core island mode.

ADVANTAGES AND INNOVATIONS

PFastpathUD is the first proposal using for Layer two Shortest Path Bridging and unicast/multicast source rooted tree construction, without need of an additional (control plane) routing protocol and the simplest one.n switches.

- Provides very simple and performant Ethernet Shortest Path bridging devices Zero configuration. Compatible with IEEE 802.1D standard in core-island mode.
- Ethernet switches are used everywhere, but have severe limitations (blocking of many links by the spanning tree protocol to prevent loops, complex configuration).
- Ethernet Fastpath switches provide high network utilization and performance equal to Shortest Path Bridges (under standardization at 802.1aq), without the need of running complex link state protocols on switches.