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COOPERATIVE PROCEDURE SDN-REPAIR NETWORK FOR FAULTY PATHS AND NETWORK BRIDGE

Patent
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Code

TIC_UAH_28

Application areas

- Information and Communication Technologies

Type of Collaboration

- Technical cooperation
- Commercial agreement and Technical assistance
- License agreement

Main Researchers

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

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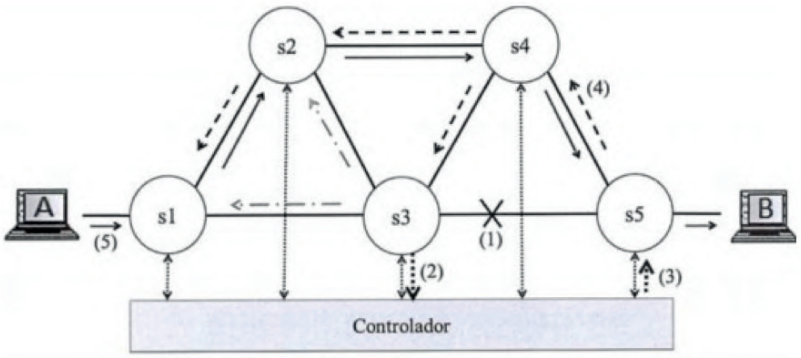

ABSTRACT

The present invention describes mechanisms that allow, in a network of transparent bridges with OpenFlow interface and equipped with learning functionality of paths with temporary blocking of the ARP-Path relearning, implementing the repair, in cooperation with the SDN controller, of all the paths in use that go through a certain link when it fails.

In this way, when a link or other cause fails to repair a path to a bridge terminal, it informs the controller by sending an OpenFlow packet of type Packet-In containing the destination address to be repaired.

The controller queries in a table the frontier bridge to which each terminal is connected and sends an OpenFlow Packet-Out packet to the frontier bridge connected to the destination terminal. This package contains a multicast repair frame that the bridge deencapsulates and sends through all its links, flooding it until reaching the bridge that detected the failure of the link, and establishing this frame as it passes through the network, a confluence tree where it can reach to the bridge of the destination terminal, whose branches, one or more, will be used by the frames in transit to the destination.

These mechanisms can be implemented in specialized hardware devices or partially or totally as software programs executed in specialized as well as generic hardware devices. Its most important application is in switches for Networks defined by software.

ADVANTAGES AND INNOVATIONS

The combination between the functionality of a bridge with OpenFlow interface to controller, and a semi-autonomous ARP-Path bridge on the same bridge, has the advantage of being able to avoid the need for the controller to control all the data flows of the network, by delegating on the bridges the function of basic forwarding of frames in layer two of the flows that are not explicitly controlled by the OpenFlow controller.

The reconfiguration of paths before failure is slow and complex both in pure SDN networks with central controller for its complete centralization, and also in ARP-Path bridge networks distributed by their extreme distribution.

This invention combines the advantages of having a central controller, with those of conducting a direct and distributed path exploration by the network from the destination bridge.