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OO/UC3M/29 - SELF CONFIGURING ROUTING AND 802.1D BRIDGING BRIDGE WITH AUTOMATIC HIERARCHICAL LOCAL MAC ADDRESSES

UCIIIM offers the first hierarchical routing protocol on layer two using self configured standard local MAC addresses. Makes Ethernet networks scalable without encapsulation. Compatible and self configurable within IEEE 802.1D standard bridges through a combined spanning tree protocol. Simple application of Up/Down routing and Distance Vector principles, enhanced Turn Prohibition mechanisms that allow last turn to destination branch to be permitted. Partner sought: big/small switch manufacturers.

Description of technology
CHT (Combined Hierarchical Tree) protocol is a datalink level network protocol that can be considered of as composed by two partial protocols: CSTP and HURP.

CSTP is an spanning tree protocol tree which builds up a central spanning tree exclusively formed by the combined capacity bridges with connectivity among them. The Standard 802.1D bridges, , get connected to it automatically, grouped in standard spanning subtrees

HURP (Hierarchical Up/down Routing) Protocol broadcasts the routes to neighbouring network bridges (those directly connected by a link) and routes the frames destined to the hierarchically assigned local MAC addresses complementing the standard (802.1D) routing through different schemes:
- HLMAC addressing and vertical routing through tree.
- Transversal HURP Routing.
- Combined spanning tree. CSTP protocol.
- Turn Prohibition.

Innovative aspects

Technology based on a RSTP generated hierarchical address tree which assigns each bridge a hierarchical address with topological meaning and that is employed for simple routing.

Includes a procedure for building up a hierarchical spanning tree from a root bridge with at least a bridge branching from it through a designated port and to whom a local MAC address expressing the bridge's position on the spanning tree is automatically assigned.

The frames with local destination address (HLMAC) are routed through a procedure using the hierarchical spanning tree with no address learning, and an innovative routing through transversal links (which are disabled by STP protocol) if the route cost is less or equal or when the use of the installed network wants to be improved.

All the (combined) extended bridges that have been assigned a hierarchical local MAC address can also process frames with universal MAC addresses assigned to destination terminals, such as an 802.1D standard bridge.

This hierarchical tree is build up together with the 802.1D standard bridge resulting in a combined spanning tree that comprises both expanded bridges and the 25 conventional bridges operating under 802.1D.

Standard 802.1D bridges can be turned into extended bridges by adding this functionality through a simple software migration.

Competitive advantages

CSTP-HURP combined switches enable the full use of the installed physical communications network, with no blocked links and with no need of manual configuration, which prevents network expansions and increases its capacity and availability.

The interoperatibility between expanded (combined) bridges and standard bridges is guaranteed. This implies a great advantage for the deployment on existing networks.

Likewise, this concept is highly suitable for high performance switches.

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Current state of intellectual property: ☒ Patent applied

Keywords
Technology of Networks, Security of Networks; Protocols of communications, interoperability; Gateways

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