

***Abstract: An Efficient Layer 2 Routing Algorithm in a Dual-ring Bridged Network for Smart Grids***

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**Abstract**

In a dual-ring bridged network, an RSTP algorithm bridge may send packets to other bridges inefficiently. An RSTP algorithm has only one spanning tree for data communication. A redundant link in a dual-ring bridged network is wasteful and inefficient. Thus, we propose an algorithm that allocates two spanning trees to two separate rings of the dual-ring using PVST (Per VLAN Spanning Tree). After allocating two spanning trees to each bridge port, a layer 2 routing table is built by exchanging new BPDU messages with other bridges using two spanning trees. By using this routing table, bridges can forward data to the destination bridge with the shortest path. Because the proposed algorithm is compatible with existing RSTP algorithms, the proposed algorithm can be used for bridges in all Ethernet networks including Industrial Ethernet networks. It also can be used for smart grid automation network technology. We provide proof of the efficiency of the proposed algorithm via OPNET simulation results.

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