FAULT TOLERANT SPACEWIRE ROUTING TOPOLOGY

Session: SpaceWire networks and protocols

Short Paper

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ABSTRACT

In order to communicate between the on-board devices, spaceWire is bus is used. SpaceWire is comprised of nodes, links and routers. This paper is related to spaceWire fault tolerant routing topology. In case of group adaptive routing, user nodes and the central nodes i.e. routers has to provide one or more extra physical links for the packet routing. For example, if two incoming packets are arrived for the same output destination port; adaptive routing provides one or more extra out ports for the routing of packet. This reduces the packet loss, if two input packets want to access the same output port. Although group adaptive routing provides link redundancy but the failure in any routing node (routing node), the whole system get down, which is not acceptable for the sensitive missions. In order to enhance the reliability of spaceWire network, fault tolerant topology is proposed. Fault tolerant topology is comprised of cross strapped central spaceWire router core. The central core is cross strapped in such a way, no single faulty node get down the whole system. In addition, a routing protocol is proposed for the support of dynamic updating of routing table. The characteristic of the routing protocol is that any faulty node immediately isolated from the rest of the system.

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