SPACEWIRE NODES

Session: SpaceWire Standardisation

Long Paper

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ABSTRACT

The SpaceWire Standard ECSS-E-50-12C is undergoing a revision. The main objective of this revision is to correct errors, remove ambiguities and to include some additional features which have been identified and agreed by the SpaceWire WG.

The title of the Standard is "SpaceWire – Links, Nodes, Routers and Networks". While the Links and the Routers are well defined the notion of what is comprised in a Node can differ. In conjunction with the special features that are going to be introduced to enable network discovery and PnP, the definition of a node in the SpaceWire network should be revised. As has been already discussed the configuration port zero, which is currently only required in SpaceWire Routers, will be introduced as a mandatory feature in SpaceWire Nodes. This is to allow a common mechanism in Nodes and Routers that can be used during network discovery to information on the network element.

The view of the SpaceWire network used currently in the standard is a Router centric one. A Node can communicate only to directly connected Nodes or through a Router to Nodes which are further away. It is in the current specification not foreseen that a node can forward a packet received on one link to a third node through another link. It is clear that this definition effectively excludes the use of a large set of commonly used network topologies. On the other side many of the SpaceWire units which have been developed lately feature an integrated router which is directly connected and communicating with the host system.

The paper will propose and discuss a revised definition of the node in a SpaceWire network. It will extend the current view of the node as terminal to a node definition which is commonly used in communication networks: "A node is a connection point that can be either a redistribution point or a communication endpoint." It will further discuss how this extension of the current definition can be made consistent with the requirements of network discovery and PnP.