

A CONFIGURABLE SPACEWIRE ROUTER VHDL IP CORE

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Short Paper

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ABSTRACT

Routers are an integral part of most SpaceWire networks and many are available as discrete components or IP cores from several manufacturers. Aeroflex Gaisler (Sweden) is developing a highly configurable SpaceWire router VHDL IP core to meet the need for a technology independent router design.

The router design is done using the same proven technology independent methodology as other IP cores from Aeroflex Gaisler. This enables the core to be easily implemented on many different target technologies. The SpaceWire links are implemented using the SpaceWire codec IP core further increasing the re-usage benefit. This also makes the router compatible with several Aeroflex components such as the SpwPHY, LVDS drivers and the RadHard clock buffer.

The number of ports is configurable from 2 to 32, which covers the complete range allowed by the standard. It also has full support for group adaptive routing, interval labeling, regional logical addressing and header deletion. This should make the core feasible for most anticipated configurations.

Configuration is done using RMAP commands to port 0, which provides a secure and portable way of providing the configuration capability. The router could also be implemented with an AMBA interface connected to one or more ports. This would allow several different backend interfaces to be easily designed using Aeroflex Gaisler's wide range of AMBA based IP cores. For example a PCI back-end could be designed by connecting a PCI IP core to the router AMBA interface.

The full paper will cover in detail the architecture, technology independent design methodology, performance and area, routing functionality and features.