The SPACEWIRE-RT project has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under Grant Agreement no. 263148

SpaceWire-RT project latest news	Newsletter #1: 01.10.2012

Dear Sir or Madam,

This is the first newsletter of the SpaceWire-RT FP7 project.

It has been sent to you because you or your company is interested in the results of our project and asked to be on the SpaceWire-RT mailing list.

Web-site information:

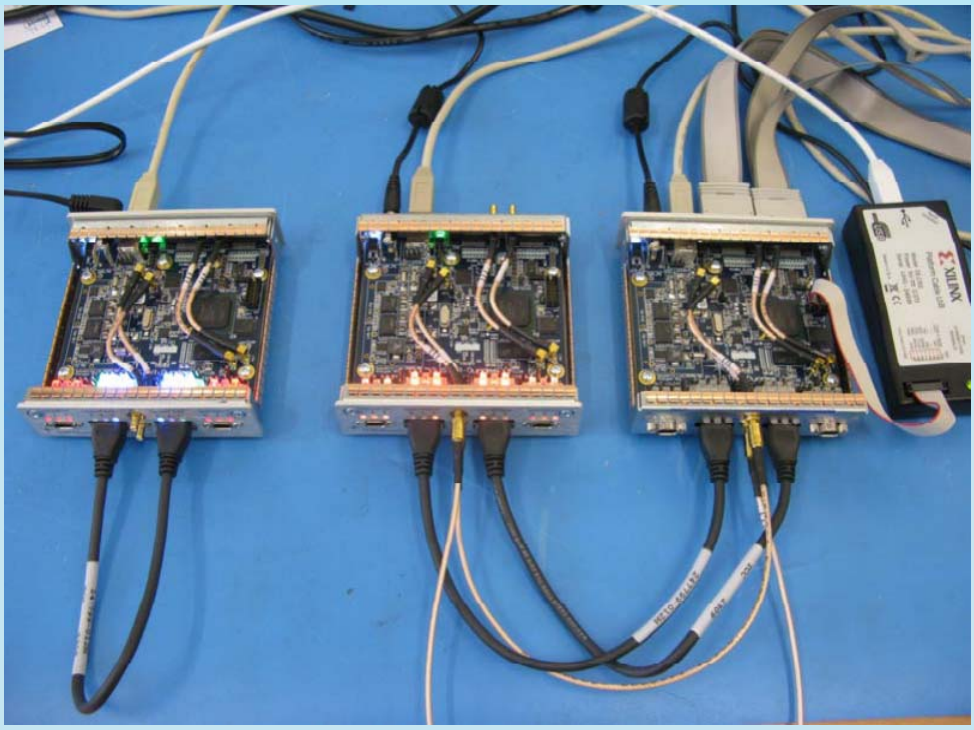
LATEST SPACEWIRE-RT NEWS

What is SpaceWire-RT?

The trend towards "Operationally Responsive Space", where spacecraft can be rapidly assembled, configured and deployed, to meet specific mission needs, e.g. disaster support, requires flexible on board communication networks with plug-and-play capability. The growing autonomy of scientific missions to remote planets requires networks that are robust and durable, able to recover from transitory errors and faults automatically. The importance of spacecraft mass reduction motivates the sharing of networks for payload data-handling and avionics. Avionics and robotics impose requirements on network responsiveness and determinism. Increasing international collaboration on scientific and Earth observation spacecraft requires standard network technology where a component developed by one nation will interoperate effectively with equipment developed by another. **SpaceWire-RT**, a project funded under the EU's Seventh Framework Program (FP7), aims to fulfill these demanding requirements with a flexible, robust, responsive, deterministic and durable standard network technology that is able to support both avionics and payload data-handling applications. The creation of SpaceWire-RT technology will substantially strengthen collaborative bonds between the Russian and European organisations involved in the research, and lead to technology of vital importance for future space missions.

The principle aims of SpaceWire-RT are:

- Support all or most spacecraft onboard communication requirements:
  - – Instrument interfacing
  - – Device and sub-system networking
  - – Inter-processor communications
  - – Gathering housekeeping information
  - – Deterministic command and control
  - – Time distribution
  - – Sub-system synchronisation
  - – Event signalling
- Provide a coherent set of protocols covering:
  - – Full range of operational speeds (1 Mbit/s to 20 Gbit/s)
  - – Full range of operational distances (0.1 m to 100 m)
  - – Using a range of physical media and signals



Prototype SpaceWire-RT Equipment

Members of Consortium

Name	Country
University of Dundee (The Coordinator)	United Kingdom
Saint-Petersburg State University of Airspace Instrumentation	Russian Federation
Astrium GMBH	Germany
Electronic VLSI engineering & Embedded systems	Russian Federation
Scientific research institute SUBMICRON open joint stock company	Russian Federation

Members of SpaceWire-RT Consortium

SpaceWire-RT 1st period progress

Activities during the first 16 months of the project were mainly focused on defining the requirements and use cases for SpaceWire-RT, designing the baseline concept and providing inputs on Quality of Service approaches to the SpaceFibre standard being developed by the University of Dundee for ESA, development of the SpaceWire-RT outline specification and start of the specification simulation process.

Astrium GmbH and Submicron gathered requirements from spacecraft manufacturers and spacecraft equipment suppliers across Europe and Russia respectively. These requirements covered many aspects of payload data-handling and avionics networks. The requirements were analysed by Saint-Petersburg State University of Airspace Instrumentation (SUAI) and University of Dundee (UNIVDUN) and compared against the characteristics of the planned SpaceFibre standard. It was clear that SpaceFibre would meet the majority of the requirements for SpaceWire-RT and so was adopted as the baseline network technology for very high data-rate applications. The outcome of this analysis was used to inform the work on QoS within SpaceFibre and resulted in a coherent precedence concept being proposed for QoS in SpaceFibre.

Based on the requirements and a review of relevant literature on real-time network concepts performed by SUAI, UNIVDUN documented the SpaceWire-RT baseline concept and outline specification.

An important part of the project is modeling. SUAI, who are responsible for validating the SpaceWire-RT specification, have prepared a “Simulation and Validation plan” which describes the work that is planned for the SpaceWire-RT simulation task. The modeling task includes the simulation of SpaceWire-RT using SDL and SystemC languages. SDL is used for testing the specified mechanisms and SystemC is used for testing the SpaceWire-RT networking mechanisms. The project SDL and SystemC models are currently being developed.

ELVEES, who are responsible for evaluating the implementation of SpaceWire-RT as an ASIC core, carried out a review and trade off of available space qualifiable ASIC technologies and have selected a preferred ASIC technology.

SUAI implemented the project web and released it to the general public. The WEB site URL is http://spacewire-rt.org/ . The web site is updated throughout the project and contains general information about the project objectives and the work to be performed in SpaceWire-RT project, as well as details of the project sites and project partners. All public deliverables are available for downloading from the web site.

SpaceWire-RT 1st review meeting

The first review meeting was held at the University of Dundee on 30th of July 2012. The meeting was attended by representatives of each of the SpaceWire-RT consortium members, our EC Project Officer and an expert reviewer from ESA. Each of the SpaceWire-RT Work Package Leaders gave a presentation on the progress made to date and the future plans. The reviewers commented on the good co-operation between the partners from the EU and Russian Federation and indicated that the results presented so far are promising. The consortium is now focused on addressing the feedback from the review and completing the remaining tasks on the project.

SpaceWire-RT 1st Review Meeting

Presentations and publications

The SpaceWire-RT consortium members have presented the project at a number of forums in the last year:

- December 2011: SpaceWire-RT Integrated EU and Russian Requirements presented at the Seventeenth SpaceWire Working Group meeting by S. Parkes (UNIVDUN).
- May 2012: Overview and progress report were made during a meeting named “The dialog between RU and EU regarding the spacecraft” by V.Olenev (SUAI).
- May 2012: Presentation on SpaceWire-RT requirements during the Russian National Workgroup meeting by V. Grishin (SUBMICRON).
- May 2012: Presentation on overview of SpaceWire-RT Outline specification during the Russian National Workgroup meeting by Y. Sheynin (SUAI).
- May 2012: SpaceWire-RT Aims and Trade Offs presented at the Eighteenth SpaceWire Working Group meeting by S. Parkes (UNIVDUN).

Further publications on SpaceWire-RT are planned in the coming months.

Contact us

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