



# RapidIO® Connections

Q4 2011

## Forward:

RapidIO has had an amazing year with many new product announcements, the launch of the RapidIO 10xN roadmap--with serial lanes up to 10 Gbps and port data rates that go up to 160 Gbps--and production shipments of RapidIO Gen2 based systems. Don't miss this issue's [links](#) to many of the recent news releases and published articles. RapidIO is seeing excitement beyond its traditional wireless and defense/aerospace markets with high interest in the Cloud Computing market, both in the data center and in server systems being pushed to the base station in wireless. The introduction of new Gen 2 RapidIO products, and a number of single board computers with RapidIO and the Intel® Core i7 processor family.

-Tom Cox.

## In This Issue

### ♦ Association News

#### **RapidIO Trade Association Releases Roadmap to 100 Gbps+ per port with RapidIO® 10xN Press Release - July 2011**

*Pushing the boundaries of performance for peer-to-peer embedded processing for the wireless, server, imaging, medical, industrial, defense and aerospace markets, the RTA announced its roadmap beyond RapidIO Gen2 in July of 2011. The new spec is S-RIO 10xN and it delivers 10 Gbps per serial lane and beyond. The S-RIO 10xN will actually scale to speeds per serial lane up to 25 Gbps in the next revision of the standard. In x4 configuration, it means 40-100 Gbps per port.*

[http://www.rapidio.org/news/pr/view?item\\_key=6ff6de5e4d4d09ba26a7242c34b85c28c9dd4af6](http://www.rapidio.org/news/pr/view?item_key=6ff6de5e4d4d09ba26a7242c34b85c28c9dd4af6)

### ♦ Industry Insights

#### **The OpenFabrics Alliance and OFED**

By [OpenFabrics Alliance](#)

*The OpenFabrics Alliance (OFA) is an open source community with a charter to develop, test and license high performance networking software for servers and storage systems.*

#### **RapidIO in Base Station: Mission Critical Performance or Enterprise Computing Performance?**

By [Dev Paul, IDT](#)

*For the carriers, the reason they use RapidIO in 4G is not just performance, but it's built in end-to-end reliability.*

- ◆ **Technical Insights**

- Low Latency Server Virtualization Using RapidIO**

- By Dev Paul, IDT*

- [http://www.rapidio.org/education/applications/Low\\_Latency\\_Server\\_Virtualization\\_Using\\_RapidIO.pdf](http://www.rapidio.org/education/applications/Low_Latency_Server_Virtualization_Using_RapidIO.pdf)

- RapidIO Simplifies Virtualization and Enables Large Data Center for Cloud Computing.*

- ◆ **In the News**

- The RapidIO Trade Association, its members and their products continued to make news in the industry. See below for links to the recent PR and published articles.*

- ◆ **Connect and Contribute**

- RapidIO Connections welcomes your comments, ideas, questions and contributions.*

## **Industry Insights**

### **The OpenFabrics Alliance and OFED**

RapidIO member companies have been working with *OpenFabrics Alliance (OFA)*. The OFA is an open source community with a charter to develop, test and license high performance networking software for a variety of applications including servers and storage systems. The OFA's open source software, OpenFabrics Enterprise Distribution (OFED™), powers some of the most powerful server and storage systems in the world in high performance computing, financial services, data warehousing, online transaction processing, managed hosting services applications and embedded systems. OFED has been proven to be the most efficient and high performance server and storage clustering software, utilizing technologies such as kernel bypass and RDMA (Remote Direct Memory Access). The tremendous growth of clustering and standards-based high performance interconnects. A host of who's who in the data center and high performance computing industries – such as AMD, Chelsio, Cisco, HP, IBM, Intel, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Mellanox, Microsoft, Oracle, QLogic, Sandia National Laboratories, Toshiba Medical and others – are members of the alliance. The kernel bypass and RDMA constructs can be a complimentary solution to a RapidIO based topology in the aforementioned applications, as RapidIO solution could be used natively for hypervisor bypass and RDMA or could be used in a complimentary manner.

An active community of open source developers and commercial companies collaborate to create and release OFED for all popular Linux and Microsoft Windows server operating system platforms. OFED forms the basis of server clustering, lossless fabric, low latency and RDMA software by leading operating system vendors and ISVs such as Citrix, IBM, Microsoft, Novell, Oracle and Red Hat. OFED has also been ported to other operating systems and virtualization platforms.

#### **Key benefits of OFED include:**

1. **Increased productivity:** OFED helps maximize the number of job operations or transactions per minute. OFED helps researchers and developers complete simulations faster. OFED helps process more capital market data-per-second and make split-second trading transactions possible.

2. **Increased ROI:** When OFED is used to cluster servers or storage systems, it boosts efficiency. What this means is that performance of the cluster can scale efficiently as more servers and storage systems are added to the cluster. And through industry-wide collaborations driven by OFA, and transport-neutral software architecture, OFED fosters vendor interoperability, enabling multiple hardware solutions.
3. **Real-time processing:** Enabling higher bandwidth at an ultra lower latency makes OFED the best choice for real-time processing. Its lower CPU overhead maximizes the server's utilization which results in faster data processing and data acquisition that are essential in embedded systems.
4. **Greener:** It is a well known fact that server and storage systems are the primary consumers of power in the data center. OFED helps reduce the number of server and storage systems needed to meet business and research goals, thereby reducing power consumption in the data center.  
The values provided by OFED are well aligned with evolving trends in the industry – the scale and productivity of enterprise data center infrastructures, embedded systems as well as Exascale clusters.

More information is available at [www.openfabrics.org](http://www.openfabrics.org).

### **RapidIO in Base Station:** Mission Critical Performance or Enterprise Computing Performance? *By Dev Paul, IDT*

The reason carriers use RapidIO in 4G is not just performance, it's the built-in end-to-end reliability. Imagine base stations that don't have S-RIO, dropping calls, having congestion and supporting less subscribers, with poorer service per base station, higher power and more cooling in bigger form factors.

- S-RIO is proven now in 3G and 4G. It works. S-RIO works reliably for every packet.
- Ethernet is not there and can't scale.
- Ethernet in wireless today is 1/20th the bandwidth of S-RIO.

When the base station is "S-RIO connected" users are getting quality and performance that goes in radars and satellites, not the Ethernet class performance that we accept with associated "blue screens" in enterprise computing.

S-RIO is good for keeping F-18's flying and used in particle accelerators....that's the degree of quality our customers hang their hat on with S-RIO. With Ethernet, you get the quality associated with main stream computing.

Is this what you want your wireless network to be?

The engineers that design for F-18 guys care about S-RIO because the airplane can't lock up mid-flight. The inherent quality that RapidIO delivers in the airplane is what consumers are increasingly expecting for mobile data and voice. They do not want nor expect a blue screen like in a personal computer. The wireless handsets today from Apple, RIM, Samsung, Nokia and others don't go blue screen. Behind the scenes, users rely on the same quality from RapidIO that goes in an airplane. RapidIO is enabling this user experience today, and will continue to in the future.

## In the News

The RapidIO Trade Association, its members and their products continue to be sought after news in the industry.

Over the course of the past few months there have been several announcements from member companies around RapidIO Gen2 silicon, boards and systems. The FPGA segment has been an active adopter of RapidIO Gen2, with Altera, Xilinx and Lattice offering a variety of RapidIO Gen2 solutions building on RapidIO 1.3 successes. FPGA adoption of RapidIO is always a key enabler to the proliferation of RapidIO at a system level, because it ensures that systems with a variety of topologies and connections to complimentary protocols can be done on a single board.

At the system level, with IDT's release of its PCIe2 to S-RIO2 bridge, we saw more products with Intel processors being used with RapidIO networks, while other vendors used the bridge to enable interfacing of mainstream PC 's into RapidIO networks. RapidIO Linux support has also been enhanced over the last few quarters with multiple updates of the Linux kernel through the open source community.

- [IDT RapidIO Gen2 Switches Selected by Prodrive to Enhance Performance of Next Generation AdvancedTCA Platforms](#) 29 Nov 2011
- [New LatticeECP4 Family Redefines Low Cost, Low Power FPGAs, Features High Performance Innovations](#) 28 Nov 2011
- [Xilinx Announces Key Connectivity IP Cores for Next Generation LTE and LTE-A Wireless Infrastructure Equipment](#) 16 Nov 2011
- [IDT Industry-Leading PCI Express® to RapidIO® Bridge and RapidIO Switch Selected by StarBridge for PCIe®-based Processor Clustering over RapidIO](#) 03 Oct 2011
- [IDT Industry-Leading PCI Express® and RapidIO® Solutions Selected by Curtiss-Wright Controls for Next Generation Digital Signal Processor Designs](#) 27 Sep 2011
- [Altera Delivers Industry's First FPGA-based Serial RapidIO Gen2 Solution Enabling Next-Generation Wireless Base Station Deployments](#) 26 Sep 2011
- [Mercury Computer Systems Wins Contract to Supply Signal and Image Processing Capabilities for Multi-mode Radar Program](#) 14 Jul 2011
- [Curtiss-Wright Controls Joins OpenFabrics Alliance \(OFA\) to Drive Continuum HPEC Initiative for COTS-Based High Density DSP Systems](#) 13 Jul 2011
- [Absolute Analysis Joins the RapidIO Trade Association](#) 06 Jun 2011
- [Mercury Computer Systems Provides Application Ready Subsystems to BAE Systems for ARTISAN 3D Naval Radar Program](#) 02 Jun 2011
- [IDT Introduces Industry's First PCI Express® Gen2 to RapidIO® Gen2 Protocol Conversion Bridge for x86 Processor Applications](#) 02 Jun 2011
- [NetLogic Microsystems Announces Production Orders into LTE Base Stations for Ground-Breaking XLP® Multi-Core Processors](#) 31 May 2011
- [Silicon Turnkey Express, announces availability of Second Generation Serial RapidIO Development Platform.](#) 27 May 2011
- [Mercury Signal Processing Subsystems Support Spectral Dominance](#) 10 May 2011
- [New Freescale QorIQ processor brings enterprise class features to security networking equipment at SMB price points](#) 09 May 2011

- [Lattice Announces 4 x 3.125Gbps SRIO Capability on the Mid-Range LatticeECP3 FPGA Family](#) 02 May 2011

## In the Spotlight:

An abundance of articles focusing on designing with RapidIO technology have appeared in the past months. Below, we've included links to some of the best.

- [Low Latency Server Virtualization Using RapidIO \(PDF\)](#) *Server Design Summit* 29 Nov 2011
- [Higher Port Speeds for RapidIO](#) *ATCA Newsletter* 01 Aug 2011
- [ITT and Mercury Computer Systems Partner To Speed Intelligence Data to Warfighters](#) *ECN* 26 Jul 2011
- [RapidIO Trade Association Spec Pushes 10 Gbit/s](#) *Electronic Design* 19 Jul 2011
- [RapidIO revs up to 10 Gbits/s](#) *EETimes* 18 Jul 2011
- [Serial RapidIO with Intel-based DSP embedded systems saves slots and boosts performance](#) *Military Embedded Systems* 28 Jun 2011
- [AltiVec Amps Up Latest QorIQ Multicore Chips](#) *Electronic Design* 23 Jun 2011
- [EMC forges secret VMAXe array](#) *The Register* 09 Jun 2011
- [A Server Backplane Worthy of the Cloud?](#) *IT Business Edge* 03 Jun 2011
- [PCI Express/RapidIO bridge impacts processors & backplanes](#) *EE Times* 02 Jun 2011
- [RapidIO Generation X+1](#) *ATCA NewsLetter* 31 May 2011
- [CommAgility announced the AMC-2C6678, its latest AdvancedMC module, which includes two high-performance TMS320C6678 digital signal processors \(DSPs\) from Texas Instruments \(TI\).](#) *ATCA NewsLetter* 30 May 2011
- [Innovative Platforms Enlist To Serve High-Performance Military Computing](#) *Electronic Design* 20 May 2011

## Texas Instruments ships RapidIO enabled TMS320C6670/6678 EVMs

By Manish Patel, TI

TI's TMS320C6678 multicore DSP is the industry's most powerful & fastest processor at 10Ghz accumulative speed across 8 DSP cores. It has native 4 lanes of RapidIO Gen 2 to provide connectivity to other processors, RapidIO switches and for use in the backplane. The TMDSEVM6678L Lite Evaluation Module (EVM) is an easy-to-use, cost-efficient development tool that allows developers to quickly get started with designs using TI's C6678, C6674 or C6672 multicore DSPs. The EVMs include an on-board, single C6678 processor with robust connectivity options that allows customers to use this AMC form factor card in various systems. The EVMs also work as standalone boards. The C6678 has recently gone into production and is shipping now.

The TMS320C6670 DSP is a 4 core communications-focused processor with various wireless accelerators. It also has native 4 lanes of RapidIO Gen 2 that allows developer to connect the DSP to various RapidIO end points for chip-to-chip and inter-board communications. The TMDXEVM6670L EVM is designed to facilitate users' evaluation of the features & functions of the C6670 multicore DSP. The emulation capability and software included in the EVM will

allow customers to program the C6670 DSP to benchmark the algorithms that are intended to be implemented on C6670 DSP.

Both EVMs come equipped with software that includes TI's Code Composer Studio™ Integrated Development Environment version 5 (CCS v5), and the Multicore Software Development Kit (MCSDK), which includes the Board Support Package (BSP), Chip Support Library (CSL), Power On Self Test (POST), Network Development Kit (NDK), SYSBIOS, and Out of Box (OOB) Demonstration software.

When combining the EVM hardware, software tools and the low sales price of \$399, these EVMs offer a compelling solution that provides unsurpassed benefits to developers and allows them to get started on their multicore designs quickly. For further information on these products please see [www.ti.com/c66multicore](http://www.ti.com/c66multicore)

## Connect and Contribute

*RapidIO Connections welcomes your comments, ideas, questions and contributions.*

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