

HiPINEB 2016

*The 2nd International Workshop on
High-Performance Interconnection Networks
in the Exascale and Big-Data Era*

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Style Powered by:



March 12, Barcelona, Spain

Motivation

- Growing importance of **Interconnection Networks** in HPC and Datacenters
- **HiPINEB Series** want to gather and discuss in a full-day event the latest and most prominent efforts and advances, both from industry and academia, in the design and development of scalable high-performance interconnects of Exascale and Big-Data systems
- Website: <http://hipineb.iza.info>

Motivation

Topics of interest

- Interconnect architectures and network technologies for high-speed, low-latency interconnects.
- Scalable network topologies, suitable for interconnecting a huge number of nodes.
- Power saving policies in the interconnect devices and network infrastructure, both at software and hardware level.
- Emerging ideas, work-in-progress and early, high-impact achievements.
- Good practices in the configuration of the network control software.
- Network communication protocols: MPI, RDMA, Hadoop, etc.
- APIs and support for programming models.
- Routing algorithms.
- Quality of Service (QoS).
- Reliability and Fault tolerance.
- Load balancing and traffic scheduling.
- Network Virtualization.
- Congestion Management.
- Applications and Traffic characterization.
- Modeling and simulation tools.
- Performance Evaluation.

HiPINEB Series

List of Activities

- **HiPINEB workshop 1st edition, Chicago, 2015**
- **Journal Special Issue: Journal of Supercomputing (2016)**
- **HiPINEB workshop 2nd edition, Barcelona, 2016**
- **Journal Special Issue: Concurrency & Computation: Practice and Experience (2017)**
- **Summer School: June 2017, Albacete, Spain**



Organization

Technical Program Committee

Francisco J. Alfaro, U. of Castilla-La Mancha, Spain

Jose Cano-Reyes, U of Edinburgh, UK

Lizhong Chen, Oregon State University, USA

Chita Das, Pennsylvania State University, USA

Reetuparna Das, University of Michigan, USA

Bruno Farcy, Atos, France

Holger Fröning, Univ of Heidelberg, Germany

Maria E. Gomez, Technical Univ of Valencia, Spain

Ernst Gunnar Gran, Simula Research Labs, Norway

Ryan E. Grant, Sandia National Labs, USA

Scott Hemmert, Sandia National Labs, USA

John Kim, KAIST, South Korea

Michihiro Koibuchi, Nat. Inst. of Informatics, Japan

Pedro Lopez, Technical Univ. of Valencia, Spain

Elad Mentovich, Mellanox Technologies, Israel

Jose Miguel Montaña, Univ. of York, UK

Gaspar Mora, Intel Corporation, USA

Julio Ortega, University of Granada, Spain

Dhabaleswar K. Panda, The Ohio State Univ., USA

Fabrizio Petrini, IBM Corporation, USA

Samuel Rodrigo, Oracle Corporation, Norway

Jose L Sanchez, Univ. of Castilla-La Mancha, Spain

Alex Shpiner, Mellanox Technologies, Israel

Tor Skeie, University of Oslo, Norway

Enrique Vallejo, University of Cantabria, Spain

Organization

Steering Committee

- **Jose Duato**, Technical University of Valencia, Spain
- **Francisco J Quiles**, University of Castilla-La Mancha, Spain
- **Torsten Hoefler**, ETH Zurich, Switzerland
- **Timothy M Pinkston**, University of Southern California, USA
- **Eitan Zahavi**, Mellanox, Israel

Program Overview

Time	Activity
9:00 – 10:30	Keynote
10:30-11:00	Coffee Break
11:00-12:30	Technical Session 1
12:30-14:00	Lunch
14:00-15:30	Technical Session 2
15:30-16:00	Coffee Break
16:00-17:30	Panel Session

Program

Keynote

Some architectural solutions for Exascale interconnects

Speaker: Prof. Jose Duato, Technical University of Valencia, Spain

Chair: Francisco J. Quiles, UCLM, Spain



Program

Technical Session 1

Chairman: Francisco J. Alfaro, UCLM, Spain

A) Interconnects Architecture, Topology and Routing:

- **A New Fault-Tolerant Routing Methodology for KNS Topologies**, *Roberto Peñaranda, Ernst Gunnar Gran, Tor Skeie, Maria Engracia Gomez and Pedro Lopez*
- **Exploring Low-latency Interconnect for Scaling Out Software Routers**, *Sangwook Ma, Joongi Kim and Sue Moon*
- **Transitively Deadlock-Free Routing Algorithms**, *Jean-Noël Quintin and Pierre Vignéras*

B) Energy Efficiency:

- **Analyzing the Energy (Dis-)Proportionality of Scalable Interconnection Networks**, *Felix Zahn, Pedro Yebenes, Steffen Lammel, Pedro J. Garcia and Holger Fröning*

Program

Technical Session 2

Chairman: Eitan Zahavi, Mellanox Technologies, Israel

C) Virtualization, Quality-of-Service and Congestion Control

- **Providing Differentiated Services, Congestion Management, and Deadlock Freedom in Dragonfly Networks**, Pedro Yebenes Segura, Jesus Escudero-Sahuquillo, Pedro Javier Garcia, Francisco J. Alfaro and Francisco J. Quiles
- **Remote GPU Virtualization: Is It Useful?**, Federico Silla, Javier Prades, Sergio Iserte and Carlos Reaño

D) Performance Evaluation and Simulation Tools

- **Application performance impact on trimming of a full fat tree InfiniBand fabric**, Siddhartha Ghosh, Davide Delvento, Rory Kelly, Irfan Elahi, Nathan Rini, Storm Knight, Benjamin Matthews, Thomas Engel, Benjamin Jamroz and Shawn Strande
- **Combining OpenFabrics Software and Simulation Tools for Modeling InfiniBand-based Interconnection Networks**, German Maglione Mathey, Pedro Yebenes Segura, Jesus Escudero-Sahuquillo, Pedro Javier Garcia and Francisco J. Quiles

Program

Panel (16:00 – 17:30)

Large scale routing vs congestion control: will it be central (SDN) or locally adaptive?

Chair: Pedro Javier Garcia, UCLM, Spain



Torsten Hoefler
ETH Zurich
Switzerland



Mitch Gusat
IBM
Switzerland



Maria E Gomez
Tech Univ Valencia
Spain

Program

Panel – Questions to address

- What's your view regarding **topologies** and **routings** suitable for very-large interconnection networks?
- How could **congestion** be managed in huge Exascale Supercomputers or Big-Data systems ?
- Will **power management** techniques become mandatory in huge Exascale or Big-Data systems?
- What's your opinion about the use of either **SDN** or **locally-adaptive** policies in networks of Exascale or Big-Data systems, especially considering **Network Scalability**?

Special Issue

Best papers among those selected for HiPINEB 2016 will be published in a Special Issue of the Wiley's journal:

Concurrency and Computation: Practise and Experience

<http://hipineb.iza.info/hipineb2016/special-issue/>

- Call for Papers: April 1, 2016
- Deadline: June 30, 2016
- Decission Date: August 30, 2016

Final Remarks

- **HiPINEB'16 Proceedings:**

<http://conferences.computer.org/hipineb/2016>

User name: hipineb16

Password: conf16

- **Web Site:** <http://hipineb.i3a.info/hipineb2016>
- **Twitter:** *@hipineb* (#HiPINEB2016)
- **LinkedIn Group**

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