Editorial

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Biographical notes: Guihua Duan received her PhD in Computer Science and Technology from the Central South University in 2010. She is currently an Associate Professor in the School of Information Science and Engineering, Central South University. Her research interests include network security and ubiquitous computing.

Carlos Becker Westphall is a full Professor, since 1993, at the Federal University of Santa Catarina, Brazil. He is the founder of Latin American Network Operations and Management Symposium (LANOMS), and of the Network and Management Laboratory at the Federal University of Santa Catarina. He obtained his degree in Electrical Engineering in 1985 and his MSc in Computer Science in 1988, both at the Federal University of Rio Grande do Sul, Brazil. He obtained his DSc in Computer Science (Network and Service Management) in 1991, at the University of Toulouse, France.

High performance computing and communications is a key enabling technology to improve cutting-edge research performance and capabilities, especially when addressing large and complex problems with tight timing schedules. Building high performance and efficient computing and communications systems can be addressed at multiple platform layers such as computer architecture, software, hardware, language and compiler design, embedded systems, and networking. The special issue on 'High performance computing and communications' will target a wide spectrum of the state-of-the-art as well as emerging topics pertaining to high performance computing, computer communications, new computing paradigms, and so on. After a careful review, six eminent papers are selected from a good number of quality submissions received. A detailed overview of the selected works is given below.

The first paper, 'An energy-efficient data transfer strategy with link rate control for cloud', proposes a novel energy-efficient data transfer strategy called LRCDT. By scheduling bandwidth in a link rate controlled fashion, LRCDT intends to reduce the

energy consumption specifically for data transfer that does not require the maximum transfer speed.

In the second paper, 'Adaptive call admission control scheme with optimal resource allocation for multi-class cellular networks', a new adaptive call admission control scheme is proposed for allocating bandwidth optimally as well as provisioning QoS to the mobile users so far as practicable.

The third paper, 'A SLA-based cloud resource provisioning optimisation mechanism for multi-tenant applications', proposes a service level agreements (SLA)-based resource provisioning optimisation mechanism for multi-tenant applications. The mechanism divides the tenants' SLA into SLA constraints, and maps each SLA constraint to the corresponding service.

In the fourth paper, 'Optimal VM placement in data centres with architectural and resource constraints', authors take into consideration of data-centre architecture, inter-virtual machine (VM) traffic pattern, and resource capacity of physical machines (PMs) to propose a low-complexity heuristic algorithm to solve the VM placement problem.

In the fifth paper, 'Optimising MPI tree-based communication for NUMA architectures', the authors treat a multi-core node as a heterogeneous unit and optimise the performance of MPI scatter/gather communications by scheduling messages according to topology information. The proposed solution is to modify the fastest edge first heuristic by taking into account how many messages can be sent in parallel between cores on different processors without impeding the bandwidth.

The last paper, 'Dynamic MPI parallel task scheduling based on a master-worker pattern in cloud computing', proposes a dynamic parallel task scheduling method by employing a master-worker model on a real-world engineering application executed on the Azure cloud. The main idea is to schedule tasks on cloud compute resources depending on the actual workload of each process instead of static-scheduled load.

We would like to express our great appreciation to all reviewers for their time and contributions, and offering good advice or recommendations, we also thank the authors for their devoted efforts, experience, and insights into these important topics. We wish that this issue will be available resource for your work.