Editorial

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Tzung-Shi Chen received the PhD in Computer Science and Information Engineering from National Central University, Taiwan, in June 1994. He joined the Faculty of Chung Jung Christian University, Taiwan, as an Associate Professor in 1996. He was a Visiting Scholar at the Department of Computer Science, University of Illinois at Urbana-Champaign, USA, from June to September 2001. Since February 2008, he has become a Professor at the Department of Computer Science and Information Engineering, National University of Tainan, Taiwan. His research interests include wireless networks, pervasive and grid computing. He is a Member of the IEEE Computer Society and Communications Society.

Recent advances in Grid technologies enable the ability to aggregate geographically distributed resources into a single integrated computing platform. A variety of heterogeneous distributed resources, such as clusters, PCs, workstations, data storage devices, or specific scientific instruments, are utilised and shared in Grid computing systems. Computational resources, storage, memory and bandwidth are complemented with content-oriented input from databases and web services. Such systems may operate in a predefined and centrally organised way, or coordination may be conducted in a self-organised, decentralised manner. Recently, an emerging research area for Grid computing has been changing from widely distributed resources sharing for data-intensive problems to service-oriented computation, collaboration and virtual organisation. Therefore, the discovery and integration of Grid resources and services on internet has become convenient and flexible in terms of the combination of Grid computing and Web services used in various Grid applications.

This special issue aims to foster state-of-the-art research in the area of grid computing and applications and is expected to focus on all aspects of Grid technologies and to present novel results and solutions to solve various

problems and challenges in Grid platforms. The six accepted papers in this special issue are collected from two different sources. The first part is to select five high-quality papers with extended versions in The 5th Workshop on Grid Technologies and Applications (WoGTA'08) to be held in Taiwan, December 2008. The second part is selected from submissions obtained by a widely disseminated call for papers. Only one high-quality paper is accepted for publications in this part.

First of all, six papers are selected rigorously from WoGTA'08 in the first part. They are extended and revised from the manuscripts presented in WoGTA'08. The focus of this part is on addressing the research issues for grid technologies and applications. The first paper is presented by *Tzu-Meng Chung, Shih-Chieh Huang, Chung-Ta King and Chiu-Ping Chang*. They formulate the bandwidth utilisation problem on a P2P VoD system and propose an optimal DP-solution to solve the problem and a distributed heuristic to work in practice. This is the best paper of WoGTA'08. The second paper by *Yu-Wei Chan, Tsung-Hsuan Ho, Po-Chi Shih and Yeh-Ching Chung* is to propose a peer-to-peer distributed storage system, named Malugo, which was based on two-layered peer-to-peer architecture. This system can cluster peers by routing locality automatically, partitioning files to different peers to achieve load balancing and replicating files to different groups to achieve geographical properties without the global information. The third paper by *Ching-Hsien Hsu and Tai-Lung Chen* is to propose performance- and economisation-oriented scheduling techniques for managing applications with QoS demands in grid. Their proposed task-rescheduling techniques, which are based on QoS-guided Min-Min algorithm, aim to reduce the makespan of grid applications in batch style and minimise the total resource cost. *Po-Cheng Chen, Jyh-Biau Chang, Yi-Sheng Lin, Ce-Kuen Shieh* and *Yi-Chang Zhuang*

to the fourth paper present a data-sharing system, which uses a hybrid scheme, designated as the On-Demand data Co-Allocation (ODCA). ODCA integrates the co-allocation mechanism with the on-demand access mechanism. Therefore, it can reduce the data waiting time by fully exploiting the downstream bandwidth of a computing node. The fifth paper by *Chao-Tung Yang, Chih-Hao Lin, Ming-Feng Yang* and *Wen-Chung Chiang* is to propose a heuristic QoS measurement constructed with domain-based information model that provides more effective information to meet user requirements. They expect that users could manage and monitor numerous resources of grid environments more effectively and efficiently.

Next, in the following, one paper is selected from many submissions throughout the world. The rigorous reviewing process was completed for including high-quality papers in this special issue. The focus of this second part is on addressing the research issues for security of grid systems. The paper by *P. Varalakshmi* and *S. ThamaraiSelvi* is to present an enhanced secured trustworthy three-tier grid architecture. The effectiveness of this layered spam-filtering mechanism can be seen from the resource consumption and depletion graphs, which clearly show that fewer resources are exhausted in a system with the filtering mechanisms in place as against the system with only trust-based resource selection.

Submissions, either extended versions from WoGTA'08 or by regular submissions, obtained by a widely disseminated call for papers to this special issue went through careful evaluation with at least two reviewers for each. Therefore, we are confident that this collection of accepted papers will contribute significantly to the development of our understanding of how advanced technology for grid computing and applications can become a significant part of computing and networking technologies.