Topic 14: Mobile and Ubiquitous Computing

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Mobile networking, mobile systems and applications and ubiquitous computing infrastructures are of strongly growing importance in the IT sector in general, and particularly for the parallel and distributed computing community. Mobile internet access has become a commonplace service. Many conventional software products such as e-mail systems, databases, or enterprise resource planning have been adapted towards mobile usage patterns. The world of ubiquitous information processing will soon be revolutionizing our day-to-day routines. Major components are sensor networks, radio frequency identification technology, and whole new layers of data management assembling their low-level signals to high-level knowledge.

While there has been tremendous progress during the last decade in the networking sector and at the mobile computing software level, many challenging research and development issues remain. Examples include the optimization of mobile communication channels, the automated planning of scalable mobile networks or the inherent support of ad-hoc routing and computing. Moreover, highly adaptive, personalized, and context-aware mobile computing software will be one of the major challenges in distributed computing of the future.

For parallel and distributed processing, these trends also mean that new, more flexible techniques of accessing global grid infrastructures are becoming available. However, mobile systems are not only access technologies but can also build the core of loosely-coupled parallel processing scenarios, even in an ad-hoc fashion. Moreover, the whole area of ubiquitous computing will yield a tremendous increase of information, for example based on the output of thousands of sensors, challenging the capacity of parallel processing architectures at the higher layers.

The international research community has shown strong interest in these and other related aspects, also resulting in a very large number of submissions to this topic area of EuroPar 2006. The reviewers and their colleagues did a great job ensuring three quality reviews for each paper. Based on their judgements and an intensive interactive discussion, we finally selected 9 papers to be presented. These contributions equally cover the areas of mobile networking and associated protocols, of ubiquitous computing based on specialized sensor network solutions, and of mobile computing with new software solutions and architectures. I would like to thank the organizers of EuroPar 2006 to have made this topic possible, and I would especially like to thank Alois Ferscha, Gianluigi Ferrari, and Valerie Issarny for their review work and for the excellent cooperation.

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