Foreword and Editorial

International Journal of Grid and Distributed Computing

We are very happy to publish this issue of an International Journal of Grid and Distributed Computing by Science and Engineering Research Society.

This issue contains 8 articles. Achieving such a high quality of papers would have been impossible without the huge work that was undertaken by the Editorial Board members and External Reviewers. We take this opportunity to thank them for their great support and cooperation.

The paper “Authentication and En-route Data Filtering for Wireless Sensor Networks in the Internet of Things Scenario” proposed an authentication and en-route filtering scheme for WSNs in the IoT scenario in which the verifiable secret sharing cryptography is used for the distribution of the shares to multiple collective sensor nodes based on the most efficient ID-based signature scheme. As long as the adversary doesn’t compromise more than T-t group nodes in an event area, any event report can be collectively generated with a digital signature attached and forwarded through multipath routing to multiple Internet nodes.

Paper “Efficiently Window Queries Processing in Dynamic Wireless Sensor Networks” shows that due to the proliferation of low-cost wireless sensors, there is growing research interest in their applications, for example, in home healthcare and location tracking. However, due to sensors’ energy resource constraint, some possible applications of sensors have been restricted. In particular, in applications concerning deployment of mobile sensors in dynamic environments, high amounts of energy are consumed by sensors to maintain routing tables. Although existing methods have been proposed to query data from sensors without the use of any routing tables, these methods typically require redundant data to be sent back to the sink and not all of the aggregation functions could be executed precisely. In this paper, an existing method is modified to provide more accurate query answers and extend the lifetime of a wireless sensor network (WSN).

In the paper “Optimization of Large Scale of Files Transfer in Meteorological Grid”, authors focus on performance enhancement of large scale of small files transfer, which is critical to the performance of meteorological grid. GridFTP and compression techniques are used to optimize the efficiency. The transfer parameters are configured before transmission, such as extended block mode (Mode E), TCP buffer size. Compression is used to compress files into single file, in order to eliminate negotiating time before transmission. During the course of the research, the disk space was sacrificed for avoiding the vicious recurrence of compression-decompression-compression.

The paper “Improving the utilization of an elastic resource: a client-side approach” proposes a client-side distributed coordination algorithm, that has the effect of regulating client requests. The algorithm is probabilistic in nature, being based on a random walk, but implements also timeout driven activities to comply with a real-time SLA. This latter detail, which reflects a common practice, makes difficult to find an analytic model, useful to investigate the algorithm.
The Authors of “A Novel Key Management Scheme Supporting Network Dynamic Update in Wireless Sensor Network” states that with the development of Wireless Sensor Network (WSN) technology, it has been adopted in a wide variety of applications such as the health care system and so on. A lot of schemes from different points of view were proposed to ensure the security in WSNs, however, most of them are proposed for static networks while it is less to consider the situation for the security of the dynamic topology update. This paper presents a novel key management scheme for the dynamic WSNs. The security authentication and random key distribution were initialized in the network deployment phase. During the network stable phase, in order to ensure the real-time update security for the network topology, the scheme proposed a dynamic updated key based on the AVL tree.

Paper “A Dynamic Resource Management with Energy Saving Mechanism for Supporting Cloud Computing” deals with Cloud computing that is becoming an important opportunities for industry to provide a high degree of scalability and serviceability of computing resources. In order to integrate the system resource, utilize the resource flexibly, save the energy consumption, and meet the requirements of users in the cloud computing environment, one of the positive solutions is to apply the virtualization technology. A dynamic resource management with energy saving mechanism has been proposed in this paper which presents a method of dynamic voltage scaling for dynamic adjustment of resources by inspecting CPU utilization in the cloud computing environment. The voltage of the idle or light loaded computer can be reduced and heavy loaded works can be migrated to those machines with lighter loading for achieving the purpose of energy saving.

In the paper “A Service-oriented Identity Authentication Privacy Protection Method in Cloud Computing”, Authors propose a service-oriented identity authentication privacy protection method. In the method, they define cloud service access control as a process and extending the cloud client related information into a fuzzy set as the authentication condition for the exchange, according to the amount of information security level, dynamic opening the corresponding service access control and providing fine-grained service-oriented identity authentication, guarantees global minimal sensitive information disclosure, and maximally protects individual privacy.

The paper “BSPCloud: A Hybrid Distributed-memory and Shared-memory Programming Model” presents a cloud computing programming model, called BSPCloud. The BSPCloud has the advantages of predictable performance. BSPCloud uses a hybrid of distributed-memory and shared-memory bulk synchronous parallel (BSP) programming model. Computing tasks are first divided into a set of coarse granularity bulks which are computed by the distributed-memory BSP model, and each coarse granularity bulk is further divided into a set of bulk threads which are computed by the shared-memory BSP model. BSPCloud makes full use of the multi-core architecture, and more importantly, the performance of the BSPCloud is predictable.

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Editors of the February Issue on
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