Foreword and Editorial

International Journal of Grid Distribution Computing

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

This issue contains 22 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 “Event Coreference Resolution Based On Heterogeneous Information Network” presents a method for event coreference resolution based on heterogeneous information network. It adopts holistic, hierarchical clustering algorithm to solve this problem. In terms of similarity measure, the proposed method utilizes the relationship between entities, events, documents and data source, calculates event comprehensive similarity through the event properties similarity.

In the paper “Cloud based VoIP Application in Aircraft Data Networks”, an improvised architecture has been proposed which helps carriers provide these facilities to the customers in a cost effective and reliable manner. Most of the aircraft communications to the ground rely on satellite for providing these services to the customers. The proposed method uses satellite communication along with cloud based VoIP to provide an efficient quality of service to the passengers. The ground stations used for satellite communication would be connected to a high speed Storage Area Network, to which the cloud network on which the VoIP application is running is also connected.

The paper “Incorporating Energy-Aware Mechanism into Workflow Scheduling Policy in Heterogeneous Distributed Systems” introduced a novel scheduling metric, namely Minimal Energy Consumption Path, to reducing the energy consumption when scheduling large-scale workflows. The proposed scheduling metric can be incorporated into current schedulers so as to enhance their capability of energy conservation as well as maintain their scheduling performance. A lot of experiments are performed by using different scheduler and experimental settings to evaluate the proposed scheduling metric and the results indicate it is effective for reducing the storage-related energy consumption, especially when the target workflows are data-intensive.

The paper “A Survey on Data Aggregation And Clustering Schemes in Underwater Sensor Networks” presents a review and comparison of various data collection algorithms and clustering schemes, proposed recently in order to execute the demands of the ongoing researches. The main goal of data aggregation technique is to accumulate data in an energy efficient manner for a long-term network monitoring. The main purpose of this study is to present algorithms addressing issues like deployment and localization in UWSNs under different conditions.
Authors of the paper “Securing MapReduce Result Integrity via Verification-based Integrity Assurance Framework” propose the Verification-based Integrity Assurance Framework (VIAF). By using task replication and probabilistic result verification, VIAF can detect both non-collusive and collusive workers, even if the malicious workers dominate the environment. They have implemented VIAF on Hadoop, an open source MapReduce implementation. Their theoretical analysis and experimental result show that VIAF can achieve high job accuracy while imposing moderate performance overhead.

The paper “Excessive Convergence and M&A Integration of Chinese Regional Cloud Computing Industry” says that nowadays, with the rapid development of Chinese cloud computing, there exist problems of regional excessive convergence and overheated investment, namely starting new items blindly, repeating construction and valuing hardware and despising software. The causes of the problems are “three lacks”: lacking full demonstration; lacking risk awareness; lacking coordination and cooperation. The important ways of solving the problems are regional cooperation, resource integration and M&A integration.

The research entitled “Analysis of Memory Ballooning Technique for Dynamic Memory Management of Virtual Machines (VMs)” aims to analyse memory ballooning technique for dynamic memory management of VMs. For this analysis, VMware based virtualization software e.g ESXi Server, vCenter Server, vSphere Client are installed and configured on the Centre for Innovation and Technology (CIT) Lab, DIU; for monitor and analyze VM performance for memory ballooning technique. The performance of memory ballooning technique is evaluated with two different test cases. The purpose is to help users understand, how this technique impact the performance. Finally, it presents the throughput of heavy workload with different memory limits when using ballooning or swapping; and analyse VM performance issue for this technique.

The paper “RUNES II: A Distributed Rule Engine Based on Rete Network in Cloud Computing” propose an approach to implement rule engine based on a message-passing concurrency model in cloud computing. The approach can be extended conveniently and it can deal with extensive rules and facts efficiently. To improve the performance of the rule engine, an algorithm of allocation is proposed. A resource cost model is explored to make high efficient use of resources in cloud. In addition, it implements the rule engine system RUNES II in cloud platform and conduct experiments to show its performance.

The paper “Advanced Mobile Terminal for Heterogeneous Wireless Networks” introduces a novel design concept for advanced mobile terminals with radio network aggregation capability and enhanced Quality of Service (QoS) provisioning for various multimedia services in heterogeneous wireless and mobile networks. The Authors establish a new module that provides the best QoS and lowest cost for any given multimedia service (voice, video and audio) by using simultaneously all available wireless and mobile networks for a given traffic flow.

In the paper “Research on Construction of Enterprise Informatization based on Model of Multi-agent RigidFormation” mainly proposes an enterprise informatization associated with rigid formation theory of multi-agent. The connection between agents and enterprise factors is represented. The relationship between enterprise factors is described by potential function theory: the attractive force presents that all factors have the same opinion, and the repulsive
force presents that all factors have the different opinion needed to be solved. Finally, the simulation proves that the model mentioned in this paper is effective.

The paper “Quality Based Solution for Adaptable and Scalable Access Control in Cloud Computing” states that Cloud Computing Environment, the data presides over a set of networked resources and these data centers may be located in any part of the world and access of the data provided through Internet. Cloud computing facilitates computing assets on demand by the use of a service provider. In the Current Scenario, Security and privacy challenges are facing in this cloud environment. The Authors implement their scheme and show that it is both efficient and flexible in dealing with access control for outsourced data in cloud computing with comprehensive experiments using the technique Hierarchical Attribute Based Encryption to protect data of the users and analyze its performance.

In the paper “A Location Context Awareness Personalized Mobile Service Prediction Model and it’s Algorithm: Design and Implementation” proposes a LCAMSP model (Location Context Awareness Mobile Service Prediction, LCAMSP) under mobile Internet environment, aims to meet the exact personal requirements of users’ current location and preference. Then, the similar users’ grouping is also a important thread to predict the continuous movement for mobile users. Because each user has own preference, a dynamic calculation function for the weight of each attribute is discussed in this paper. Finally, taking the hotel reservation service as an example, a verification algorithm will be applied to measure the performance of LCAMSP method.

In the paper “Evaluation of Airport Capacity through Agent Based Simulation”, The proposed agent based architecture is a microscopic model of aircrafts’ movement; each aircraft is represented as an agent capable of getting its routing results from instructing agent, and makes its own deconfliction decisions on the basis of a part of the observable scene local to that aircraft. An example of airport capacity evaluation is given, and the result is verified through comparison with SIMMOD. Finally, further research is applied to analysis the reason for delay.

In the study entitled “Optimization Model of Reliable Data Storage in Cloud Environment Using Genetic Algorithm”, based on analysis of data storage process in cloud environment, the cost of massive data storage is considered to be comprised of data storage price, data migration and communication; and the storage reliability consists of data transmission reliability and hardware dependability. A multi-objective optimization model for reliable massive storage is proposed, in which storage cost and reliability are the objectives. Then, a genetic algorithm for solving the model is designed. Finally, experimental results indicate that the proposed model is positive and effective.

Paper “Comprehensive Research and Application of Cloud Computing in Enterprises” introduced the definition of Cloud computing and provide the architecture for creating Clouds with market-oriented resource allocation by leveraging technologies. They also provide a hypothetical case analysis to show the economical efficiency for medium-sized enterprise to deploy servers on the cloud instead of establishing server center of their own.

The paper “Research on Optimal Scheduling of the Cloud Computing Resource based on the Genetic Algorithm in Distributed Computing Environment” says that because of these new features, grid computing, the original task scheduling mechanism, can’t work effectively
in distributed computing environments, hence, it need a new task scheduling method to solve the problems. With considering the complex characters of the task in different distributed computing applications, firstly, they construct a more comprehensive task scheduling model, which has three sub objective functions. Secondly, it presents an improved genetic algorithm to solve the multi-objective NP-hard problem. Finally, it implements some simulation experiments, and the evaluation results show us that the proposed model and improved GA are efficient and effective.

The paper “Semantic Discovery of Cloud Service Catalog Published Over Resource Description Framework” states that Cloud computing is a model to provide pool of services on demand which is shared among the consumers and metered. Cloud deployment should support efficient mechanism to publish its services in a right method such that the end users identify them. Services have to be discovered according to user’s requirement dynamically. The proposed work discusses about introducing semantics in the cloud services description, such that it projects itself apart from other providers and capably handle the commercial demand for their services. The semantics are introduced at the service catalog level and the CSP publish their list of services in the form of RDF, whose semantics are defined in a provider specific ontology. The system was evaluated with keyword & frequency matching discovery and proved to be efficient with semantic discovery over RDF data.

In the paper “Resource Scheduling Simulation Design of Firefly Algorithm Based on Chaos Optimization in Cloud Computing” the Artificial Firefly Algorithm is studied, on the basis of which the chaos algorithm is introduced to improve the algorithm with regard to the problem of the subsequent search and optimization precision deficiency cause by the lack of initialization of firefly position in the firefly algorithm.

The paper “A Survey on Clustering based Meteorological Data Mining” states that data mining is an important tool in meteorological problems solved. Cluster analysis techniques in data mining play an important role in the study of meteorological applications. The research progress of the clustering algorithms in meteorology in recent years is summarized in this paper. First, the Authors give a brief introduction of the principles and characteristics of the clustering algorithms that are commonly used in meteorology. On the other hand, the applications of clustering algorithms in meteorology are analyzed, and the relationship between the various clustering algorithms and meteorological applications are summarized. Then they interpret the relationship from the perspectives of algorithms’ characteristics and practical applications. Finally, some main research issues and directions of the clustering algorithms in meteorological applications are pointed out.

The paper “Intrusion Detection System for Mobile Ad hoc Networks Based on the Behavior of Nodes” states that a Mobile Ad hoc Network (MANET) can be defined as a network of mobile nodes that communicate over the wireless radio communication channel. It is also defined as a network without any underlying infrastructure and offers unrestricted mobility. Due to their open nature and lack of infrastructure, security for MANETs has become an intricate problem. To transmit data over such a network, generally any routing protocol that enables dynamic, self-starting multi hop routing between mobile nodes is used. However these routing protocols are vulnerable to various kinds of attacks. The conventional security mechanisms of protecting a network are not sufficient for these networks. Hence a second level of defense to detect and respond to the security problem called an Intrusion Detection System (IDS) is required. An IDS based on anomaly based intrusion detection that
works by checking the behavior of the nodes was proposed to overcome some of the attacks like blackhole, grayhole and flooding attacks. Generally the malicious nodes demonstrate a different behavioral pattern of all the other normal nodes. So the specified approach where a Data Transmission Quality (DTQ) function is used to determine the behavior of the nodes as malicious or legitimate is used. The DTQ function is defined in such a way that it will be close to a constant or keep changing smoothly for genuine nodes and will keep on diminishing for malicious nodes. The proposed method was implemented using AODV as the routing protocol for transmitting data.

The paper “QTBiCGSTAB Algorithm for Large Linear Systemand Parallelized” proposed a QTBiCGSTAB algorithm whose core idea is that recursively divides sparse matrix with quarter tree into sub-matrix and reorders them, to improve the hit ratio of cache and enhance the algorithm’s efficiency. And the idea is good for algorithm being parallized, that is proved by the numerical experiments later. It mainly shows, firstly, QTBiCGSTAB algorithm is more efficiency than BiCGSTAB, and the speedup would reach 1:330. The target division length would be influenced on the algorithm’s performance; Secondly, for large linear system, parallelized QTBiCGSTAB is more efficiency than serial’s.

In “Research of Manufacturing Resource Sharing System Based on P2P”, a distributed manufacturing resource sharing system model is proposed, making logic sub rings by the type of resources and the logic main rings by the super nodes. The relay of the resource rings and the convergence of different types of resources for application are completed by super nodes.

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**Editors of the December Issue on**
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