

Internet as Indispensable Everywhere: The Introduction to the Advances in Internet Technologies and Applications Special Issue

Research on internet technologies has attracted increasing interest in the past decade, as indicated by a growing number of conceptual and empirical articles. Studies [1,2] on internet usage show the following trend during the past two decades. Growth of internet users over the world from 2000 to 2012 has an increase of 566% and Asia has the growth of 842%. Currently, over 2.5 billion people in the world use the internet. 41% of all men and 37% of all women in the world use the internet. 41% of the world's households can connect to the internet.

For people in the developed economies, Internet usage is already a part of daily life activities. Up to 78% of all households in the developed economies are connected to the internet. However, only 28% of all households in the developing world can connect to the internet. Recently, industry practitioners and policy makers have devoted themselves on introducing Internet in the developing and underdeveloped economies. Now, Internet is not a privilege only for people living in developed economies. More than 1 billion Internet users live in Asia.

The popularity of Internet is booming in developing and undeveloped economies. In Africa, Internet penetration rate in households from 2009 to 2013 has 27% annual growth. The annual growth in Asia and the Pacific is 15% [1]. Fixed broadband prices are dropped by more than 82% over the past five years as industry report by InternetWorldStats.com. More countries, like Taiwan, South Korea, Hong Kong, Japan, and Bulgaria raise most of their fixed broadband subscriptions to high-speed broadband.

In the past five years, mobile devices move to our daily life and make an astonishing growth. The global mobile-cellular penetration rate approaches almost 100% all over the world. In 2013, there are 7.1 billion people in the world and number of mobile-cellular subscriptions is almost 6.8 billion, in which more than half of them are in the Asia-Pacific region. Mobile broadband subscriptions have an average annual bandwidth growth rate of 40% from 2007 to 2013. The high popularity of mobile device makes possible of using Internet everywhere as people want.

These statistics reveal that our Internet world is changed to higher speed, cheaper price, and more users by both fixed and mobile connection. This tendency generates an urgent demand on technologies and applications on internet and mobile systems. Improving network speed makes heavy bandwidth applications, like multimedia, to be feasible. More users increase system scale for creating the requirement of new system structure.

Therefore, we assemble this special issue to provide a platform for advance Internet research. This special issue comprising of seven papers is focused on the various aspects of internet and computer technology development. Five of them are excellent papers selected from the proceedings of the 3rd International Conference on Internet Studies (NETs2012), which were held in Bangkok, Thailand, August 17-19, 2012. The other two papers are selected from the 2nd conference on Applied and Theoretical Information Systems Research (ATISR) held in Taipei, Taiwan, December 27-29, 2012.

The aims of NETs2012 and 2nd ATISR conferences are to serve as forums for scholars of relative disciplines of Internet studies, especially on discussing advanced techniques of internet protocol, system development, and computer technology. Papers were selected both including the basis of fundamental ideas and system development techniques. The papers are organized as follows.

The paper titled "Framework for Distributed e-Learning Management System" proposes a concept of distributed e-learning management system by using RESTful web services to improve the efficiency limitation of using only one single server.

The paper titled "An Exchange Framework for Intrusion Alarm Reduction in Mobile Ad-hoc Networks" presents a secure alarm exchange framework for proactive MANET(Mobile Ad Hoc Network) routing protocols and use Optimized Link State Routing model (OLSR) for the implementation.

The paper titled "OOPProPHET: A New Routing Method to Integrate the Delivery Predictability of ProPHET-Routing with OOP-Routing in Delay Tolerant Networks" presents a method to integrate the delivery predictability of ProPHET-Routing with OOPProPHET-Routing method to achieve a good tradeoff between the delivery ratio and the numbers of forwarding packets.

The paper titled " A Centralized State Repository Approach to Highly Scalable and High-Availability Parallel Firewall" implements a highly scalable, high-available parallel firewall with centralized state repository intending for high-speed connection environment.

The paper titled " An Adaptive Reversible Image Watermarking Scheme Based on Integer Wavelet Coefficients" presents an integer wavelet transform based reversible image watermarking scheme to improve the embedded capacity for raising the performance over network usage.

The paper titled "Proposal of an Exploitation-oriented Learning Method on Multiple Rewards and Penalties Environments and the Design Guideline" presents a new XoL(exploitation-oriented Learning) method that can treat

multiple rewards and penalties on machine-learning system effectively.

The paper titled "Bare metal provisioning to OpenStack using xCAT" presents an approach for extending OpenStack to support bare metal provisioning through xCAT(Extreme Cloud Administration Toolkit) over cloud computing.

We would like to thank Prof. Prabhat Mahanti, Editor-in-Chief of Journal of Computers, and Dr. George J. Sun, Executive Editor of Academy Publisher, for giving us the opportunity to organize this special issue and for their great help in the organization of this issue. We thank all authors for their submissions and all reviewers for their sedulous work in evaluating these submissions. We sincerely hope that you enjoy reading these distinguished papers.

Keywords: internet, mobile, computer technology

References:

- [1] <http://www.internetworldstats.com/stats.htm>
 [2] "The World in 2013: ITC Facts and Figures", International Telecommunications Unions (ITU), <http://www.itu.int/ITU-D/ict/facts/material/ICTFactsFigures2013.pdf>.

Guest Editors:

Chien-Chang Chen, Department of Computer Science and Information Engineering, Tamkang University, Taiwan
 Email: ccchen34@mail.tku.edu.tw

Chih-Chien Wang, Institute of Information Management, National Taipei University, Taiwan
 Email: wangson@mail.ntpu.edu.tw



Chien-Chang Chen received the Ph.D. degree from Department of Computer Science at National Tsing Hua University, Taiwan. He is currently an Associate Professor at the Department of Computer Science and Information Engineering, Tamkang University, Taiwan. He serves as Program Chair, Conference Chair, or PC Member of a number of conferences. He has published over 50 journal and conference papers. His research interests include secret image sharing, watermarking, and texture analysis.



Chih-Chien Wang is currently a Professor and Chairperson with the Graduate Institute of Information Management at National Taipei University in Taiwan. He is editor and on the Editorial Board of several international journals. He serves as Program Chair, Conference Chair, or Program Committee Member of a number of international conferences. He serves as president of the Academy of Taiwan Information Systems Research (ATISR) since 2010 and is in trust committee of several Taiwanese academic organizations. Dr. Wang has authored and co-authored three text book and over 100 journal and conference papers. His research interests are in the areas of electronic commerce, Internet marketing, cyber society, and online behavior.