

# Call for Papers

IEEE Network Special Issue on

## Advances in Broadband Access Networks

### Background

The explosive growth of the Internet as well as the emergence of various broadband services has been placing a huge bandwidth demand on the underlying telecommunications infrastructure. To support this growth, the backbone networks of the telecommunications infrastructure have experienced a tremendous growth in bandwidth capacity with the wide deployment of fiber-optic technology in the past decade. However, the subscriber access networks, which cover the “last mile” communications and serve numerous residential and small business customers, have not been scaled up commensurately. Thus the last mile is becoming a potential bottleneck, especially with the increasing demand for broadband services like Internet telephony, video (including TV programming) and audio streaming, massively multiuser online gaming, etc. In recent years, the subscriber access networks have been extensively upgraded with the deployment of innovative xDSL and Cable TV technologies. However, these technologies still have their own limitations and will be severely challenged in meeting the ever-increasing bandwidth demands of customers. For this reason, advanced optical access networks such as the various FTTx technologies (Fiber-to-the-home (H), curb (C), building (B)) have been envisioned as more scalable with respect to bandwidth, long-term solutions to the “last mile” problem in the future. Meanwhile, as a transition solution, xDSL-based fiber-to-the-node (FTTN) architectures and HFC-based service delivery architectures are becoming more and more central for the delivery of Triple Play converged services (TV, telephony, and Internet access) to residential customers. Moreover, wireless access networks such as WiMax, called “wireless last mile”, have emerged as alternatives suitable for special situations or geographic areas because of their convenient and inexpensive deployment with no need to extend expensive wireline infrastructure.

No matter what kind of technology is employed, a successful broadband access solution must be not only scalable, upgradeable, and reliable, but also implemented at a low cost in order to increase the economic viability of many potential broadband applications. This presents many challenges in different aspects of access network design. In the network architectural aspect, the main challenges include network architecture design and network scalability and upgradeability. A well-designed network architecture can not only largely improve network scalability and upgradeability but also significantly reduce network implementation costs. In the service delivery aspect, the main challenges include service convergence and quality of service (QoS) provisioning for differentiated services as well as network reliability and security. For this purpose, efficient resource allocation, scheduling, and admission control schemes are needed to guarantee QoS for differentiated services. Effective reliability and security schemes are also needed to make network services more reliable and secure. In addition, new revenue-generating broadband services are urgently desired.

### Scope of Special Issue

With this special issue, we aim to provide a reference issue covering the latest advances in the network architectural and service delivery aspects of advanced broadband access networks. The special issue will consider original research and survey articles prepared in accordance to the guidelines of the IEEE Network magazine (<http://www.comsoc.org/pubs/net/ntwrk/authors.html>) written in a tutorial manner comprehensible to the non-specialists. Contributions are solicited within the scope of this issue in the following subject categories:

- (1) FTTx and HFC distribution networks
- (2) WiMax access networks
- (3) Network and service delivery architectures
- (4) Service convergence (e.g., Triple Play)
- (5) QoS provisioning and resource allocation schemes
- (6) Admission control and scheduling schemes
- (7) Network scalability and upgradeability
- (8) Network reliability and security
- (9) New broadband services and applications
- (10) Industry report: deployment and standardization statuses

\*\*\*Note that submissions covering physical layer aspects are out-of-the-scope of this special issue.

### **Manuscript Submission**

Authors must submit their complete manuscript electronically in PDF format by email to Jun Zheng ([jzheng@ieee.org](mailto:jzheng@ieee.org)) (not to the magazine's Editor-in-Chief) before the deadline. Please also include information about the manuscript (title, complete list of authors, corresponding author's contact, abstract, and keywords) as a text file in the body of your submission email message.

### **Important Dates**

- Submission deadline: January 15, 2007
- Acceptance notification: May 2, 2007
- Final manuscript due: July 10, 2007
- Publication date: 3<sup>rd</sup> Quarter, 2007

### **Guest Editors**

Jun Zheng  
School of Information Technology and Engineering  
University of Ottawa  
800 King Edward Street  
Ottawa, Ontario K1N 6N5, Canada  
Email: [jzheng@ieee.org](mailto:jzheng@ieee.org)

Yang Xiao  
Department of Computer Science  
University of Alabama  
101 Houser Hall, Box 870290  
Tuscaloosa, AL 35487-0290, USA  
Email: [yangxiao@ieee.org](mailto:yangxiao@ieee.org)

Abbas Jamalipour  
School of Electrical and Information Engineering  
University of Sydney  
Bldg J03  
Sydney, NSW 2006, Australia  
Email: [a.jamalipour@ieee.org](mailto:a.jamalipour@ieee.org)