# NETWORK TESTING SERIES

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The last call for this series received seven submissions. We accepted two of them, with one from academia and another from a joint team of academia and industry. At the time of writing this editorial for these two articles, we are also closing the process of reviewing the next batch of submissions. The number of submissions remains stable, and we should be able to pick and publish at least one from the product vendors, test laboratories, or test equipment vendors, which gives enough industrial favor to this series. We are seeking the possibilities of increasing the number of submissions to exceed 10 in the future calls, and publishing three articles per issue with possibly one from invited authors and two from the open call. The due dates remain June 1 and December 1 each year.

The article on packet dispersion ("Packet Dispersion Techniques over WiMAX Links: Challenges and Problems") examines the problems in applying bandwidth estimation techniques such as CapProbe for a path of all wired links to a path with at least one wireless link such as WiMAX. Since the packet dispersion techniques for bandwidth estimation of a path rely on measuring the change in the time interval between consecutive packets through the path, the error would be high if some links in the path do tricky things other than the simple first-in first-out (FIFO). Unfortunately, in order to maximize the bandwidth usage and reduce the transmission and signaling overheads, WiMAX, as an example wireless link standard, exercises the packing and concatenation functions to pack small packets into one and concatenate several packets into a burst, respectively. These destroy the nature of the work-conservative FIFO links and distort the time interval between consecutive packets, which is relied on by the packet dispersion techniques. To circumvent such problems, the authors suggest enlarging the size of measuring packets to over half that maximum frame size, and the time interval between the first and last measuring packets to over the maximum burst duration defined in the standard. There is further work needed in that direction. In general, this is an interesting article on testing and measuring a path.

The article on the wrap-around testing methodology ("A Systematic and Flexible Approach for Testing Future Mobile Networks by Exploiting a Wrap-Around Testing Methodology") presents a testing framework that wraps around the testing target with its inbound and outbound both connected to the test environment. As the testing target grows in size from a module to a system without a physical platform to a system with the physical platform, the testing environment also grows in size, but without having to be rebuilt or relocated. When the testing tools utilized are selected properly, the testing environment can combine the flexibility of simulations and the high performance of hardware solutions. As the same testing tools can be used in all the testing phases, the maintenance problems stemming from large and heterogeneous testing toolkits can be alleviated. The article demonstrates the application of this approach to testing a Long Term Evolution (LTE) evolved node B (eNB), where the performance of LTE air interfaces is tested under various channel conditions.

## BIOGRAPHIES

YING-DAR LIN [F] (ydlin@cs.nctu.edu.tw) is a professor of computer science at National Chiao Tung University (NCTU) in Taiwan. He received his Ph.D. in computer science from the University of California in Los Angeles (UCLA) in 1993. He served as the CEO of the Telecom Technology Center during 2010–2011 and a visiting scholar at Cisco Systems in San Jose, California during 2007–2008. Since 2002, he has been the founder and director of Network Benchmarking Lab (NBL, www.nbl.org.tw), which reviews network products with real traffic. He also cofounded L7 Networks Inc. in 2002, which was later acquired by D-Link Corp. He recently, in May 2011, founded Embedded Benchmarking Lab (www.ebl.org.tw) to extend into the review of handheld devices. His research interests include design, analysis, implementation, and benchmarking of network protocols and algorithms, quality of service, network security, deep packet inspection, P2P networking, and embedded hardware/software codesign. His work on multihop cellular was the first along this line, and has been cited over 500 times and standardized into IEEE 802.11s, WiMAX IEEE 802.16j, and 3GPP LTE-Advanced. He is currently on the editorial boards of *IEEE Transactions on Computers*, *IEEE Computer*, *IEEE Network*, the *IEEE Communications Magazine* Network Testing Series, *IEEE Wireless Communications*, *IEEE Communications Surveys and Tutorials*, *IEEE Communications Letters*, *Computer Communications*, *Computer Networks*, and *IEICE Transactions on Information and Systems*. He recently published a textbook, *Computer Networks: An Open Source Approach* (www.mhhe.com/lin) with Ren-Hung Hwang and Fred Baker (McGraw-Hill, 2011). It is the first textbook that interleaves open source implementation examples with protocol design descriptions to bridge the gap between design and implementation.

ERICA JOHNSON (erica.johnson@iol.unh.edu) is the director of the University of New Hampshire InterOperability Laboratory. In this role, she manages and oversees over 20 different data networking and storage technologies providing all aspects of administration, including coordination of high-profile testing events, coordination with different consortia, and working with various industry fora. She is also a prominent member of organizations both internally and externally. She enjoys a powerful mix of technology and business related activities. At the University of New Hampshire she participates in the UNH Steering Committee for Information Technology, the Senior Vice Provost for Research Working Group, and Computer Science Advisory Board. In the industry, she was appointed the technical representative of North America for the IPv6 Ready Logo Committee and was also chosen to be an IPv6 Forum Fellow. Passionate about the laboratory and its possibilities, she continues to work with many industry fora, commercial service providers, network equipment vendors, and other universities in order to further the InterOperability Laboratory's mission.

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