Lecture Notice

Topic: **Software Defined Networking: Why, When, Where, and How**

Speaker: **Ying-Dar Lin, IEEE Fellow, IEEE Distinguished Lecturer**
Distinguished Professor of National Chiao Tung University, Hsinchu, Taiwan

Venue: **University of Sydney, Room SIT-123 School of IT(Building J12)**

Date: **11 June 2014, 4:00 -5:00pm**

Contacts: **Prof.Albert Zomaya**(albert.zomaya@sydney.edu.au),
Dr Javid Taheri(javid.taheri@sydney.edu.au)

Map: http://sydney.edu.au/maps/campuses/?area=CAMDAR

Abstract:

The first wave of cloud computing was to centralize and virtualize servers into the clouds, with a phenomenal result. The emerging second wave, named Software Defined Networking (SDN), is to centralize and virtualize networking, especially its control, into the clouds. SDN deployment started from data centers and now expands to the model of "networking as a service" (NaaS) offered by the operators to enterprise and residential subscribers. By centralizing the control-plane software of routers and switches to the controller, and its applications, and controlling the data-plane of these devices remotely, SDN reduces the capital expenditure (CAPEX) and operational expenditure (OPEX) because the devices become simpler and hence cheaper and number of administrators could be reduced. SDN also enables fast service orchestration because the data plane is highly programmable from the remote control plane at controllers and applications. However, as we detach control plane from where data plane resides, new protocols shall be introduced between control plane and data plane, as the southbound API between controllers and devices and the northbound API between controllers and applications. As we further extend the control plane from controllers to applications such as Service Chaining (SC) and data plane from devices to Network Function Virtualization (NFV), newer mechanisms and APIs need to be added to these APIs. We argue why, when, and where SDN would prevail, and then illustrate how to make it happen. We shall introduce the key technology components, including OpenFlow, SC, NFV, and Network Service Header (NSH) and then review the issues on standardization, development, deployment, and research. At the end, the development and deployment experiences of a campus SDN solution for Wi-Fi/switch control and management are shared.

Short Biography:

YING-DAR LIN [F'13] (ydlin@cs.nctu.edu.tw) is a Distinguished Professor of computer science at National Chiao Tung University (NCTU), Taiwan. He received his Ph.D. in computer science from the University of California at Los Angeles (UCLA) in 1993. He served as the CEO of Telecom Technology Center in Taipei 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 founded, in 2011, the 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 co-design. His work on multihop cellular was the first along this line, and has been cited over 600 times and standardized into IEEE 802.11s, IEEE 802.15.5, IEEE 802.16j, and 3GPP LTE-Advanced. He is an IEEE Fellow and currently an IEEE Distinguished Lecturer for 2014–2015 and on the Editorial Boards of IEEE Transactions on Computers, IEEE Computer, IEEE Network, 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 has served and is serving as the Lead Guest Editor for several Special Issues in IEEE journals and magazines, and Symposium Co-Chair of IEEE GLOBECOM '13 and ICC '15. He 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 text that interleaves open source implementation examples with protocol design descriptions to bridge the gap between design and implementation.