Invited Talk 1

5G Network and its Security Problems

– **Abstract**:

Due to some existing problems, 4G is insufficient to satisfy users' needs. 5G is one of the trends of current network research. In this talk, we would like to discuss the problems of 4G, and describe why 5G can solve some of the problems. Software Defined Networking (SDN), Network Functions Virtualization (NFV), Network Slicing, Multi-Access Edge Computing (MEC) and Cloud-based Radio Access Networks (C-RAN) may be the possible solutions. With the former three features, Evolved Packet Core (EPC) will be virtualized as Virtualized EPC (vEPC) which has the higher efficiency and network flexibility. Its QoS, performance, reliability, connectivity, availability, deployment, expandability and maintainability will be improved. With the first four, i.e., SDN, NFV, network slicing and MEC, new innovative applications and valued-add services can be developed. With the fifth, network management cost can be reduced. In this talk, we will discuss how they work. At last, we would like to raise the possible security problems of the new network architecture.

Keywords: 5G, Software Defined Networking (SDN), Network Functions Virtualization (NFV), Multi-access Edge Computing, Network Slicing (MEC) and Cloud-based Radio Access Networks (C-RAN)

– **Speaker**: Prof. Fang-Yie Leu (Tunghai University, Taiwan)

Fang-Yie Leu received his bachelor, master and Ph.D. degrees all from National Taiwan University of Science and Technology, Taiwan, in 1983, 1986 and 1991, respectively. His research interests include Wireless Communication, Network Systems, Sensor Networks and Security. He is currently a professor of Computer Science Department, TungHai University, Taiwan, the chairperson of Big-data master program of this university, and one of the editorial board members of at least 5 journals. Prof. Leu now organizes MCNCS and CWECS international workshops. He is an IEEE member and currently serves as the TPC member of at least 10 international conferences. He was also a visiting scholar of Pittsburg University.

Invited Talk 2

ABPass: Attribute Proof-Based Credential
for Privacy-Preserving Authentication

− **Abstract**:

Electronic identity system is a user-centric identity management system which emphasizes the balance between security and privacy of identity-based transactions. Under minimum information disclosure requirement, users can just reveal the necessary personal information to service providers for authentication.

It is not uncommon in some use cases that the user just need to prove a relation (e.g., AND, OR, CNF, DNF) over attributes instead of being identified. For example, the user can just prove that he is either a staff or a teacher when using a copy machine in a laboratory; or the user can just prove that he is a subscriber over 16 years old when requesting a movie from a movie streaming service provider. To meet the requirement of such cases, we propose an attribute proof-based credential system ABPass for privacy-preserving fine-grained authentication. To users and service providers in trust relationship with ABPass, privacy is addressed for anonymity and unlinkability, while security is addressed for accountability and against identity forgery and theft as well. Considering that ABPass is applied in the source-limited devices such as smart card or smart phone, it is required that the efficiency of cryptographic building blocks and attributes proof protocols being largely concerned.

In the presentation, the application scenario will be firstly demonstrated. Then some cryptographic building blocks will be briefly introduced. Finally, we will discuss future works.

− **Speaker**: Dr. Nan Guo (Northeastern University, China)

Nan Guo received the BE in Computer Science \& Technology, the ME and the PhD in Computer Application Technology, from Northeastern University, China, in 1999, 2001, 2005, respectively. She joined Northeastern University in September 2005. She has been an associate professor since 2008. She has been a visiting scholar at department of Computer Science, Purdue, from August 2010 to August 2011. Her research interests are security and privacy in social network and digital identity management.