# Submission and Registration Form

**I. Title**—Title of presentation:
TOWARDS GREEN CLOUD COMPUTING IN HETEROGENEOUS NETWORK INFRASTRUCTURES

**II. Author(s)**—Full name (First name family name):
- Assoc. Prof. Nguyen Huu Thanh
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**III. Organization(s)**:
- Hanoi University of Science and Technology, Hanoi - Vietnam
- Post and Telecommunications Institute of Technology, Hanoi – Vietnam
- University of Malaya (Malaysia) - tentative

**IV. Topic selection:**
Smart Community
- Green ICT
- Power reduction
- Secure and clean ICT environment

**IV. Abstract:**

The advances in Information and Communication Technologies (ICT) in the last decades have massively impacted on economy and societies around the world. Many cloud data centers have been built up in a very large scale, even geographically distributed with a huge number of servers to satisfy the demand of ICT and cloud services. In cloud computing paradigms, cloud service providers can typically build their own data centers to offer cloud services or alternatively make use of data centers provided by third-party *Infrastructure Providers* (InP). In either former and later case, data center virtualization comes into play, which is a concept of network virtualization (NV) that allows creating multiple, separated virtual data centers (VDC) on top of physical data centers.

Although the benefit of having that cloud infrastructure is considerable, such a large data center consumes huge energy volume, which leads to consequently high operation costs and large carbon emission footprints. For those reasons more

energy-efficient data centers and cloud network infrastructure are on demand and have been attracted much attention from research communities recently.

From the technical point of view, the purpose of this research is to focus on energy-efficient network virtualization methods towards greener cloud computing paradigms. Network and server virtualization as well as network function virtualization are the key smart stand-by technique for reducing energy consumption in cloud computing. However, virtualizing of network still faces many difficulties and can take long, while computing provisioning takes only minutes. Thus it is necessary to deploy an energy-aware platform for virtualization and estimate the energy saving level as well as the complexity of those green approaches. Moreover, methods to place virtual network functions in the cloud also greatly affect on the overall power consumption and user's QoS. Thus, by combining network virtualization and network function virtualization with dynamic adaptation of network devices, the trade-offs between energy efficiency and other factors such as QoS, reliability, revenue should be defined for the future of the Internet.

Furthermore, through the partnership built between Vietnamese and Asian partners within this research, further research collaboration on the areas of energy-aware cloud computing is expected.

This research is based on the project: "*ECODANE: Reducing Energy Consumption in Data Centre Networks based on Traffic Engineering*" (joint research project between Hanoi Unviersity of Science and Technology and University of Wuerzburg, Germany)

Expected outcomes:

- An energy-aware platform for network virtualization and network function virtialization based on SDN technology
- Joint publications on energy-aware data centers and cloud between partners
- A collaborative network, including HUST's, PTIT's and UM's scientists for future cooperations.

## V. Speaker information:

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## VI. Support for speaker—circle or underline any that you wish to request:

- None