Proposition de recherche doctorale

Mobility and multihoming in network slicing

Mots clés : Array

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- Co-encadrant(s) : 
- Unité de recherche : Laboratoire d'informatique de Paris 6
- Ecole doctorale : École Doctorale Informatique, Télécommunications, Électronique de Paris
- Domaine scientifique principal : Sciences et technologies de l'information et de la communication

Résumé du projet de recherche (Langue 1)

Future network infrastructures such as 5G mobile networks will be strongly based on network virtualization and slicing techniques. Physical generic devices are shared among virtual networks called slices. Resource allocation strategies are necessary to meet the Quality-of-Services required by the applications and efficiently use network resources. In principle, network slices are isolated one from another. A network slice is an end-to-end collection of virtual network functions in both control and user planes of a network. Slicing becomes more challenging when users have a high mobility level such as in vehicular networks or terminals are connected to different wireless technologies in case of multi-homing.

The objective of this PhD thesis is to propose efficient slicing algorithms taking into account high mobility and multi-homing in future networks. Horizontal and vertical handovers can be studied in the context of intra-slice and inter-slice handovers in the future slicing-based networks. Multi-homing can be considered as multi-slice communications. The PhD candidate should propose new mobility and multi-homing management protocols and resource allocation algorithms to cope with the complexity of the new slicing-based network architecture.

The proposed architecture, protocols and algorithms should be evaluated using simulations. Current network simulators such as OMNeT++ and NS-3 do not support slicing-based networks. The PhD candidate should contribute in the development of new open-source network simulation modules to have a simulation platform apt to the needs of the PhD thesis.

Informations complémentaires (Langue 1)

Collaboration:
Some parts of the PhD thesis will be in collaboration with Telecom-ParisTech.

References:
(1) Ali Alfoudi, Mohammed Dighriri, Abayomi Otebolaku, Rubem Pereira and Gyu Lee, Mobility Management Architecture in Different RATs Based Network Slicing, 32nd International Conference on Advanced Information Networking and Applications Workshops (WAINA), Krakow, Poland, May 2018.
(3) Sławomir Kukliński, Yuhong Li, Khoa Truong Dinh, “Handover Management in SDN-based Mobile Networks”, IEEE Global Communications Conference (Globecom) Workshop on Management of Emerging Networks and Services, Austin, Texas, USA, December 2014.