Multi-Objective flow-interface mapping in heterogeneous and mobile networks
Rodrigo Silva, Jean-Marie Bonnin

To cite this version:
Rodrigo Silva, Jean-Marie Bonnin. Multi-Objective flow-interface mapping in heterogeneous and mobile networks. BMW SUMMER SCHOOL 2016 Car as a service – creating tomorrow’s smart mobility service platform, Jul 2016, Tegernsee, Germany. hal-01898310

HAL Id: hal-01898310
https://hal.archives-ouvertes.fr/hal-01898310
Submitted on 18 Oct 2018

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
Multi-Objective flow-interface mapping in heterogeneous and mobile networks

Context

Number of vehicles growing worldwide
- Impacts in our quality of life:
  - Air pollution
  - Traffic jam
  - Fatal car accidents

Connected vehicles
- Despite applied countermeasures, deaths on cars accidents remains high ➔ Need to reduce human intervention ➔ Connected cars
  - Connected cars would be a major element of the IoT ➔ representing 20% of all devices on 2020 (Gartner, Inc.)
  - Ecosystem of Services

Network heterogeneity
- Necessary to use existing access technologies to connect all these heterogeneity of devices
- Vehicles could take advantage from a wide variety of wireless access technology
- on-board gateways could provide transparent network connectivity to embedded applications and on-board devices

Standardization
- To ensure compatibility of communication in heterogeneous environment of different devices, applications and networks ➔ necessary a standard architecture (ISO/ETSI)

Research works

Decision Making
- Few works consider use of multi-interface simultaneously and routing flow per flow
- Different decision techniques are used: Multi-Attribute Decision Making (MADM); Multi-Objective Optimization (MOO), Game theory

Monitoring
- Most works consider cooperation with networks based on the standard 802.21 (MIH)

Applying decision
- Decisions applied on the network layer, usually using MIP and NEMO + MCoA

Overview of recent research works

Realization of thesis

Smart Decision Maker
- Necessary an intelligent decision maker to flow-interface mapping:
  - Taking into account Applications’ requirements, Users preferences, Administrators’ policies and Networks characteristics
  - Capable to perform Flow per Flow management
  - Use short-term prediction for smarter solution
  - Management of multiple interface simultaneously
  - Take into account context information