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User Centric Networking

Mobility in User-Centred Networks: shall users participate?

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creating and sharing knowledge for telecommunications

User-Centric Networks: Motivation

Ubiquitous access

Mobile devices widespread

Users forming community networks

- Users develop spontaneous wireless networks
- For cooperation and access sharing
  - Users share subscribed Internet access
- User becomes a provider of services

Re-use of resources already in place

- No need for a new access
- Profit for Operators: more traffic and services

Extension of connectivity

Example of FON

- Wireless community enabler
- Users can share Wi-Fi (profit or with other FON users)

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User-Centric Networks: Characteristics

User-centric networks approach is not completely synchronized with the Internet end-to-end principle

- Break of the notion of a clear functional splitting between end-systems and the network

Usually they rely on existing network topologies

- As complement to existing access networks: they allow expansion of such infrastructures across one wireless hop

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User-Centric Networks: Examples

Hotspot owner willingly shares the Internet access with specific friends, using a local authentication procedure

Regular municipality Wireless Fidelity (Wi-Fi) case, in a mesh topology

Residential scenario, where a regular user at home decides to open access to a specific communities (managed by a virtual operator?)

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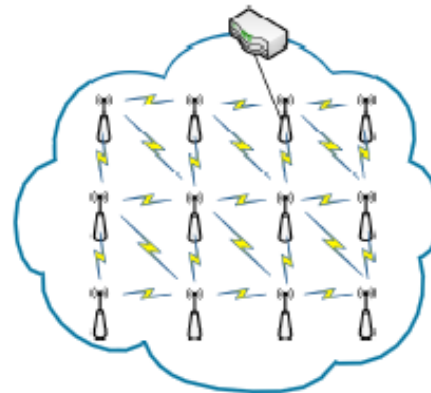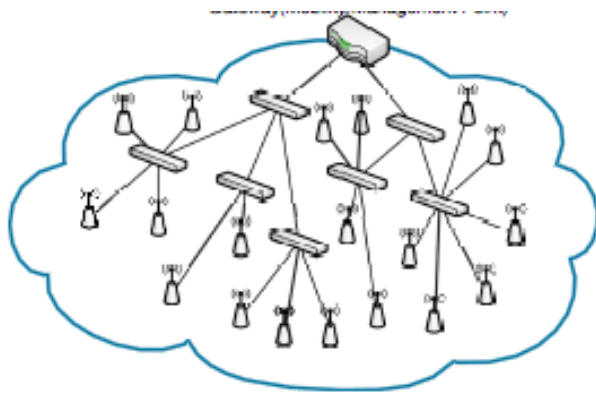
Mobility in User-Centric Networks: why should mobility be an issue?

Majorly, personalization and dinamicity

- The social behavior inherent to humans is also impacting the way network access is perceived
- The network elements are usually devices either carried or controlled by regular Internet users or providers
- Users share subscribed Internet access
- Users (and hence, the devices they own) tend to be mobile, with large dynamicity
- Control features in the network?
  - Do we need a new paradigm for mobility?

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Mobility in User-Centric Networks: should users participate in mobility?

User-centric approaches for mobility?

Assist the individual user and the provider?

Personalization and dynamicity

  Mobility process applied to distinct users with different

- Mobility patterns
- Services, its characteristics and requirements
- Social networks

How can users comply with them in terms of mobility?

Mobility in User-Centric Networks: shall the control go for the user? (1)

Which processes should be controlled where?

Bindings?

Discovery?

Updates?

Traffic?

What do we really want to enhance on mobility?

Overhead?

Latency?

Delays?

Privacy?

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Mobility in User-Centric Networks: shall the control go for the user? (2)

Pros

Flexibility in mobility management

Network of micro-providers

Exploit mobility control mechanisms among users in the same community

Cons

Dinamicity – gateways and network elements may be constantly changing – the MP may change or switch off its network equipment

Requirement of studying specific mobility patterns – social mobility modelling with strong impact

Personalization – difficult to manage users as control points specific to users needs

Control points dynamically defined and migration may be required

Impacts

Identification of each user should be taken into account

- IP for both location and identification is not the best solution

Dynamic and personalized approach

Mobility in User-Centric Networks: does seamless mobility make sense?

Session continuity or services access while moving?

+ VoIP and video call seamless

- Video with resumings when access is available

Is possibility to be on the move more important than QoE?

Again, personalization is the driving factor

Control points dynamically defined according to services/users needs

Social mobility models may greatly help

Some important characteristics of control points

Type of network element (core, access, terminal)

Average internet connection time

Total available shared bandwidth and its usage

Location (latitude, longitude)

Mobility Area Range

Mobility in User-Centric Networks: trust/security aspects

Users with mobility functions

May require interaction with operator mobility points (HA)

Or… a mediator is required?

Are security/trust issues similar to ad-hoc/vehicular networks?

Differences

- Interaction with operator
- Requirements shall be more demanding and diverse
- User-centric may be a small part of the network (extension of current networks)

Are incentive approaches enough?

Mobility in User-Centric Networks: expectations from users

What can users expect from mobility in user-centric networks?

2nd class of communication?

Which types of services can be provided?

Can differentiation on mobility be provided?

What about privacy on mobility? Can it be enhanced?

THANK YOU!

QUESTIONS?

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