

User Experience and Emotion-Aware Business Network Service Selection¹

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On the 10th of September 2008, the European Commission launched its Future Internet Research and Experimentation (FIRE) initiative [1]. We envision the Future Internet as being able to infer the user experience quality of the network services it provides and take into account these user emotions at time of selection of these network services. As a first step towards this vision, we are investigating appropriate mechanisms for mobile network selection based on Quality of Experience (QoE) as part of the consortium who won funding from the EU for the 3 million Euros plus PERIMETER project [2]. We stress that it is important to make the difference between QoE and Quality of Service (QoS). The ITU-T in its E800 recommendation [3] defines QoS as follows: “the collective effect of service performances, which determines the degree of satisfaction of service users”. However, until now, QoS is mostly based on technical network results rather than what the users really perceive of the service, for example, in terms of usability, accessibility, retainability, reliability, efficiency... QoE corresponds to that forgotten side of the results. In the same line of thought, the idea of having an Always Best Connected (ABC) connection seems more vision than reality. This may be because the current state-of-the-art solutions, such as IETF Mobile IPv6 (MIP) or the emerging Host Identity Protocol (HIP), mainly focus on mobility management, instead of again considering additional user related issues such as user preferences, associated cost, access-network, operator reputation, and trust and application related issues like QoS and failure recovery in conjunction with mobility. Another explanation could be the different meaning associated by telecom operators and users with the word *best*. Unless telecom operators can directly benefit from allowing a user to switch to another operator, operators have an incentive to bind the user to their networks or service provisioning. In contrast, for end-users ABC means saving money by switching to the lowest cost operator.

PERIMETER’s main objective is to establish a new paradigm of user-centricity for advanced networking. In contrast to network-centric approaches, user-centric strategies could achieve true seamless mobility. Putting the user at the centre rather than the telecom operator enables the user to control his or her identity, preferences and credentials, and so seamless mobility is streamlined, enabling mobile users to be ABC in the multiple-access multiple-operator networks of the Future Internet. In addition to mechanisms for QoE selection, as depicted in Figure 1, PERIMETER will provide innovative implementation of protocols for fast authentication, authorisation and accounting based on privacy-preserving digital

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identity models. Supplementary QoE statistics will drive session level content adaptation processes, thus requiring session level QoE signalling mechanisms between mobile terminals and application/service providers, to support continuously changing network conditions and user preferences. All these PERIMETER mechanisms will be designed to be independent from the underlying networking technology and service provider, so that fast, inter-technology handovers will be possible.

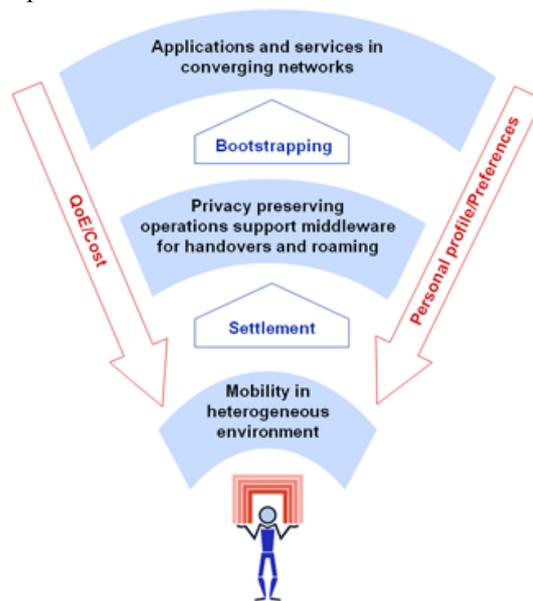


Fig. 1. High-level View of PERIMETER

The users will propagate their QoE results in a decentralised overlay of information that will not be controlled by the telecom operators. In this way, the competition between the telecom operators will be more transparent to the users and we expect that it will end up in a very competitive Future Internet in Europe. To avoid fraud and security issues, distributed and self-organizing methods of QoE aggregation will require incorporation of trust and reputation algorithms and mechanisms in mobile terminals. Based on our experience in designing attack-resistant decentralised computational trust and identity management [4], we will research and deliver the required computational trust building blocks for PERIMETER decentralised QoE aggregation.

References

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