

## **Title: Real-time multicast/broadcast communications over heterogeneous networks**

### **Introduction**

Traditionally, the support for context-aware services in general and context-aware multicast-broadcast services in particular, has been provided at service layer or as middleware functionality. However this approach ignores the underlying network and the limitations and constraints imposed by its capabilities and is the prime hindrance towards wide-spread deployment.

Multicast-broadcast service support does exist in mobile communications networks, the most notable example being 3GPP MBMS. However, the functions and features of such services will have to be further developed and extended to support dynamic user group and environment mediated group management, and efficient service delivery by multicast-broadcast bearers. Important aspects are the interactive multicast-broadcast service support, context-based network selection/session management and authentication & authorization support for heterogeneous networks, use of IP multicast and reliable bandwidth based QoS routing.

### **Objectives**

The aim of this PhD Thesis is to study and propose new mechanisms for the support of a generic multiparty transport service for multicast applications, investigating techniques to allow the multiparty transport facility to flexibly adapt to the changing networking context and technology, including mobility of the users and applications. For this purpose, the following areas of work are of main importance:

- Context-based network selection in a heterogeneous networks environment, so that according to the changing networking context, appropriate access networks will be selected for use by different users.
- Definition of a rich and generic multiparty transport service to allow an application to establish a multicast session without being concerned with the routing and transport methods as well as the networks to be used.
- Use of IP multicast capability as an efficient means to support multiparty application sessions over broadcast networks, including, if required by the applications, the support of reliable multicast and bandwidth-based QoS routing.
- Dynamic application of IP unicast or multicast routing to support a multiparty session, depending on the changing networking context to enable a flexible, efficient and effective multiparty transport.
- Support of seamless mobility, where mobility is completely integrated with the generic multiparty transport.
- Address the issues of these communications in multi-hop networks and support the required extensions.

### **Advisory**

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### **Research Institution**

The work will be integrated in the Institute of Telecommunications – Aveiro.

### **Financial sources**

If required, it may be possible to provide a scholarship funded mainly from European projects.