WiMAX applications to extend national research and education networks

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Extended Abstract

This paper describes the main objectives, achievements, technical challenges and expected final results of the project WEIRD (WiMAX Extension to Isolated Research Data Network). Weird is an European funded 24 month integrated project aiming at implementing research testbeds, using the WiMAX technology, in order to allow isolated or impervious areas to get connection to the GEANT2 research network. The WEIRD project consortium is made up of: prestigious key players - in the world of wireless communications and next generation networking -, scientific demanding user communities - that will drive and test the WEIRD system -, and sponsoring European national research networks – that will give connectivity, support and will exploit project results.

This paper describes the expected contribution of the project to the standardization of WiMAX integration into next generation networks. The 4 European testbeds and their interconnection through GEANT2 is described (Figure 1). A first requirement analysis, that has been supported mainly by the scientific user communities, academia and network operators, derived by the application scenarios, is described and have been categorized into 3 groups: the Volcano and seismic activities monitoring, the fire prevention and the tele-medicine/tele-hospitalization.

This paper shows how the application scenarios will be validated into the implemented testbeds. Moreover, the functional architecture of the Transport and Network Control and Management Plane is described. This Plane is the core part of the system, and pave the way to the further study of control procedures that can, from one hand, give the maximum exploitation of the network resources, and , from the other hand, provide the maximum quality experience to the users. The features that the system aims at validating include: QoS, resource and access management, authentication authorization and accounting (AAA) and security, environmental awareness and full mobility support. Therefore, the state of the art of next generation networking is improved and the WiMAX specific layers are deeply analyzed and enhanced . Figure 2 shows the WEIRD testplant.

The project outputs will have a strong impact on ongoing international activities, for this reason it has already planned an effective and pragmatic dissemination and exploitation plan both for the internal companies and for the outside world.

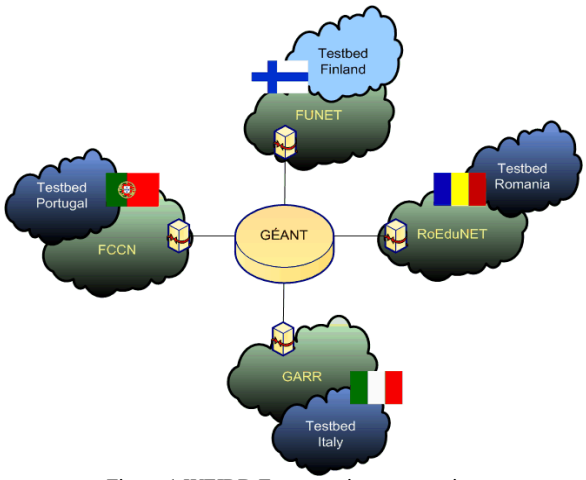

Figure 1 WEIRD European interconnection

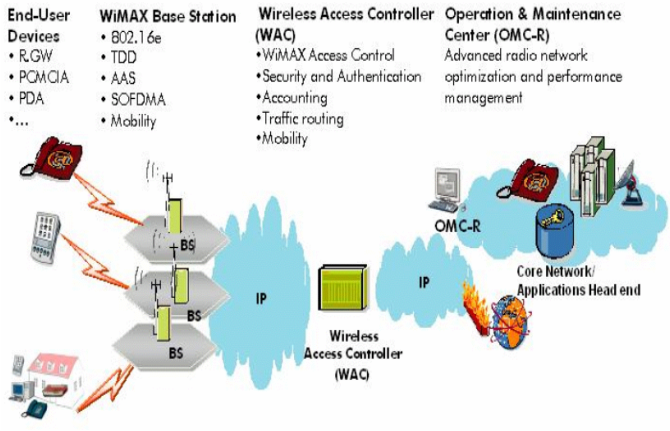

Figure 2 WEIRD test-plant