Tomorrow's Network Today

Opening remarks by Guido Salerno, Head of the Cabinet, Italian Ministry of Communications

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Introduction

Due to the rapid diffusion of broadband and mobile technologies, our societies are preparing to enter an age in which any person can enjoy the benefit of "anytime/anywhere" network access: this is known as the "Ubiquitous Era".

The large diffusion of different types of wireless technologies (like 2G, 3G, WLAN, PAN) in the Italian telecommunications system are a valid support to an "ubiquitous network society".

The ubiquity of information and of communications will have a significant impact on the current telecommunications landscape and on business practices. It will also raise a number of public policy issues, in particular regarding: privacy, security, consumer protection and social inclusion. For this reason, any new R&D project must focus on the impact of ubiquity on these aspects, so as to propose integrated solutions that encompass areas such as: security techniques, privacy aspects, operation and control methods of complex networks.

The study of integrated solutions is part of the research that public and private companies, in Italy, are planning as activity to invest in for the immediate future. The Ministry of Communications has indicated the importance it attributes to this research and is paving the way for emerging technologies, by introducing modern regulation and is conducting, with the support of the Fondazione Ugo Bordoni, experimental trials apt to carry out results useful to modify some technical features (frequency bands, range of applications, etc.) more appropriate to the EU and Italian market, as it was with the introduction of Wi-Fi technology, and presently is with WiMAX.

Technological Ubiquity

The concept of "technological ubiquity" has been increasing in the public sector and has the industry's attention for the last two years. Mobile phones and the Internet have already permeated all aspects of human life in many parts of the world. A next step in "always on" communications, new ubiquitous

technologies (such as RFID) promise a world of networked and interconnected devices (e.g. fridge, television, vehicle, garage door, etc…) that provide relevant content and information, whatever the location of the user. In particular, the convergence (and future scalability) of broadband Internet and ubiquitous networks, with current mobile services, may emerge as the key means for providing communication and monitoring capabilities to users.

An ubiquitous network society needs a communications environment that offers large-volume data anywhere and at any time. The next-generation network will aim at terabit class (1,000,000,000,000 bit) transmission on the backbone network and will provide further broadband integration of access networks, with the introduction of Fiber To The Home (FTTH), which connects offices and homes directly, with high-speed, utilizing optical fiber.

The need of wireless technologies

Albert Einstein, asked to explain radio, is reported to have replied:

> *You see, wire telegraph is a kind of a very, very long cat. You pull his tail in New York and his head is meowing in Los Angeles. Do you understand this? And radio operates exactly the same way: you send signals here, they receive them there. The only difference is that there is no cat.*

From the standpoint of promoting ubiquitous networking, in addition to wired networks, the progress in broadband technologies applied to wireless networks, for which active technological innovations are expected, will become increasingly more important.

In particular, this ICT revolution, in terms of radio applications, will require the development of a modern network infrastructure, the development of a utilization infrastructure and the evolution of utilization solutions.

The basis of the ubiquity society is a large capacity radio network and, surely, it’s not possible to solve the problem with a “cat”, but even with the existing radio technology.

Necessarily, the technologies supporting the ubiquitous network society encompass specific areas such as security and privacy.

As far as security is concerned, it should be kept in mind that an ubiquitous network, accessible through wireless and wired equipment, is vulnerable to attack, so that the security issue could be the most serious bottleneck to stall the ubiquitous network society.

As far as privacy management is concerned, it should be noted that all the benefits, offered by the ubiquitous technology, will cost to the users some privacy. In particular, in the case of object tracking, which is a potential service, offered by the ubiquitous network, there could be a substantial and potentially intrusive activity, in the case of “personal” object such as a cell phone that is used by people on a daily and reserved basis.

Furthermore, another important issue that affects the development of the ubiquitous technology is the public policy issue of: “digital divide”. In Italy, this matter deals mainly with the problem of

development of ICT in depressed/rural areas; this could lead to the possible differential development, of the ubiquitous network society, in the various Italian regions.

This is the reason why a large effort is requested to fill the gap of digital divide, and why the Ministry of Communications, jointly to Regione Valle d'Aosta and Fondazione Ugo Bordoni, has planned an important research program in the Valle, a very good example of concentration of natural difficulties, limiting the ICT society development. Obviously, the first step is to fix the right technologies and the more appropriate infrastructure of the telco network: these are the results expected from the experiments in Valle.