

WIRELESS COMMUNICATIONS

Developing countries receive training in Trieste

New wireless technologies, often employing “free” unlicensed radio spectrum, can provide affordable broadband Internet access and voice service to the developing world if matched by supportive public policies and business approaches. Eighty young scientists, engineers, and lecturers, mostly from universities in developing countries, were in Trieste (Italy) from 7 February to 4 March 2005 to get a hands-on experience in developing low-cost and reliable technologies. They were selected from among 300 candidates from around the world to attend a course on “radio-based computer networking for research and training in developing countries. The three-week course was held within the scope of a cooperation agreement signed in February 2004 between the ITU Telecommunication Development Bureau (BDT) and the Abdus Salam International Centre for Theoretical Physics (ICTP).



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Young scientists and engineers get a hands-on experience in developing low-cost wireless technologies

university campuses, conference venues or even neighbourhoods around the world.

Participants in the course learned how off-the-shelf equipment, combined intelligently with free software and do-it-yourself design elements, can be used to establish inexpensive modern wireless communication networks. Together they designed, built, deployed and tested simple antennas and complete radio links transmitting computer data and multimedia content over distances from a few metres up to dozens of kilometres. The longest link was established between ICTP, the venue of the course, and Grado across the Gulf of Trieste. Through this partnership, BDT and ICTP seek to contribute to the advancement of human resources, and research and development capabilities in the field of telecommunication science and technology in developing countries.

Hamadoun I. Touré, Director of BDT, underlined the role of ITU in promoting the use of the most suitable technologies, including wireless, as a way to address costs particularly in the case of rural and remote areas that have lower subscriber density or geographic challenges (mountainous terrain, large bodies of water, or jungles). “ITU is studying the convergence between IMT-2000 (3G mobile) and WLAN-based systems. These studies include the technical and operational characteristics that could facilitate the mass production of simple terminal equipment at affordable prices for the worldwide provision of high-speed satellite-based Internet services,” Mr Touré said.

In a round table on the role of information and communication technologies (ICT) for research and training in developing countries, leading industry experts discussed a range of topics from the use of the simplest FM micro-transmitters in small villages, new trends in satellite delivery of broadband signals, terrestrial wireless technologies, to the World Summit on the Information Society (WSIS). Wireless local area networks (WLAN) – the most popular and widespread of this being Wi-Fi (wireless fidelity) – and the emerging Wi-MAX promise to provide alternative network infrastructure that can bring both voice service and high-speed Internet access to under-served urban and rural areas. Much of the focus was on these technologies. WLANs are being operated for private use, such as in the home, or to create short-range public networks. Known as hotspots, these networks are now largely found in airport lounges, coffee shops, university campuses, conference venues or even neighbourhoods around the world.

Bill Luther of the United States Federal Communications Commission (FCC) also underscored the important role of ITU in the frontiers of radiocommunications.

"Working Party 8F of the ITU Radiocommunication Sector (ITU-R) is the global focal point for the continuing vision of next generation wireless services and systems, acting as a forum for user requirements and as a catalyst for translating those requirements into technical reality," Mr Luther explained. "WP8F has the challenging task of supporting the near-term needs of the IMT-2000 marketplace while exploring where we might go in the wireless world of the future," he added.



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ITU News caught up with some of the organizers and participants to gather their views on why the radio school of 2005 mattered to them. Ryszard Struzak, member of the URSI Commission on Developing Countries and former Vice-Chairman of the ITU Radio Regulations Board, commented: "The progress of humanity has been possible thanks to gathering, sharing, and applying knowledge. Today, we witness a bitter paradox: 90 per cent of all information is registered in an electronic format, but 80 per cent of the world population has no access to it. No doubt, such a 'digital gap' limits further progress and social and economic development. An ideal solution is 'universal access', but it is an enormous challenge. A strong involvement of indigenous talent is crucial here, and this school aims at facilitating the task. It focuses on new technologies, but warning: technology alone could not eradicate poverty, and the digital gap is meaningless for those who lack safe water, adequate nutrition, basic education, and other essentials..."

In Trieste, they designed, built, deployed and tested simple antennas and complete radio links transmitting computer data and multimedia content

Professor Radicella, Head of the Aeronomy and Radiopropagation Laboratory at the ICTP had, this to say: "In an increasingly knowledge-based society, information is becoming a vital factor of development and the terms 'networked' and 'isolated' will be added to the criteria for differentiating between developed and developing countries. The challenge today is to provide all countries with adequate links to the rest of the world to avoid the risk of being cut off from the mainstream of information flow. The academic and research community is an obvious starting point to supply the skills to use wireless, low-cost and open-source technologies needed towards this goal."



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Arun Mehta from India remarked: "If we can speed up the process, introduce people to the technology, and teach them how to deploy it, we make a massive contribution to development. I was privileged to spend a week with a bunch of students who had, within three weeks of training, just completed a megabit link over a distance exceeding 25 km. This, to me, is empowerment at its best, when people realize that they can take charge of their own telecommunications."

According to Shree Bhadra Wagle, Deputy Chief Engineer of Radio Nepal: "The school provided an open and guided environment for engineers and research students from developing countries to learn and put into practice the designing of low-cost WLAN networks. With the fundamentals of radio technology and its latest applications in the developed countries, the course has offered me confidence to apply the skills in expanding the information network to narrow the widening digital gap in a least developed country like Nepal."

Spectrum analyser

Professor Bharat Chaudhari of the Networking and Telecommunications International Institute of Information Technology expressed a similar view. He added: "Another problem faced by most of the developing countries is paucity of skilled human resources for the handling of new technologies. This course certainly gave a trigger to the participants to spread the knowledge acquired on the advanced technologies."

A number of companies and institutions that supported the "school of 2005" include: Alvarion (Italy), the Central European Initiative, CSTI (France), EHAS (Spain), GTZ (Germany), France Telecom, the FCC, ICS-UNID (Italy), Inveneo (United States), ISF (Italy), Metrix (United States), O'Reilly Media (United States), Skylogic (Italy), Wire.less (Denmark), Rohde and Schwarz (Germany), STEM (India), ULA-EsLaRed (Venezuela) and the International Union of Radio Science (URSI).