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CARMEN project fosters carrier-grade mesh networking

The CARMEN project will allow the provision of carrier-grade services over wireless mesh networks comprised of heterogeneous radio technologies, meaning more available, easier-to-deploy services at lower cost.

Institute IMDEA Networks, a research institute in the area of computer networking backed by the Madrid Regional Government, in collaboration with NETCOM Research Group from University Carlos III of Madrid, has announced the successful conclusion with outstanding grades of the European Project [CARMEN](#) (CARrier grade MESH Networks), designed to enable the provisioning of carrier-grade services over wireless mesh networks comprised of heterogeneous radio technologies. The project ran from the beginning of January 2008 to the end of January 2011, and included the participation of nine partners from the public and private sectors, including four universities, three telecommunications companies and two equipment vendors. The project was initially led by Prof. Dr Arturo Azcorra, currently on leave from his post as Director of IMDEA Networks, and later by Dr. Albert Banchs, the Institute's Deputy Director.

Current backhaul solutions for radio access networks consist mostly of wired leased lines or point-to-point, high-capacity radio links, both of which are slow to deploy, expensive and not always available. Mesh networks, on the other hand, are "self-healing", making them very reliable, and are also economical, reusable, and significantly easier and faster to deploy than current systems. These features make them particularly well suited to incremental deployments or temporary scenarios such as natural disasters.

Among the achievements embodied in the CARMEN architecture are support for multiple wireless technologies, the efficient use of radio resources, capacity-aware mobility management, support for broadcast and multicast services, and self-configuration capabilities, features supported through the creation of new protocols and algorithms. The success of CARMEN will pave the way for the development of new carrier-grade mesh wireless products, lower deployment and maintenance costs for operators and better services at lower cost for users.

The project has resulted in the creation of a specialized IEEE study group, 12 different patent filings by the industrial partners, the publication of an RFC and contributions to various IETF working groups, 56 articles published in recognized journals and presented at international conferences and workshops, as well as special issues of journals and magazines, panels and sessions and public workshops. Additionally, the project operators are planning to showcase CARMEN-derived technology in different events and field-trials, and the academic partners are

planning further research into radio resource management and heterogeneous wireless systems.

The partners participating in CARMEN were University Carlos III of Madrid with Institute IMDEA Networks, Alcatel-Lucent Deutschland AG, British Telecommunications PLC, Deutsche Telekom AG, Fraunhofer Gesellschaft Zur Foerderung DerAngewandten Forschung E.V., NEC Europe Ltd., AGH University of Science and Technology, University College Dublin and National University of Ireland, Dublin.

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About us

IMDEA Networks Institute, promoted by the Regional Government of Madrid, is a research organization on computer and communication networks whose multinational team is engaged in cutting-edge fundamental science and technology. As a growing, English speaking institute located in Madrid, Spain, IMDEA Networks offers a unique opportunity for pioneering scientists to develop their ideas. IMDEA Networks has established itself internationally at the forefront in the **development of future network principles and technologies**. Our team of highly-reputed researchers is designing and creating today the networks of tomorrow.

Some keywords that define us: 5G, Big Data, blockchains and distributed ledgers, cloud computing, content delivery networks, data analytics, energy-efficient networks, fog and edge computing, indoor positioning, Internet of Things (IoT), machine learning, millimeter-wave communication, mobile computing, network economics, network measurements, network security, networked systems, network protocols and algorithms, network virtualization (software defined networks – SDN and network function virtualization – NFV), privacy, social networks, underwater networks, vehicular networks, wireless networks and more...

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