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Excellent grades for CARMEN

The Audit of the European Project CARMEN (CARrier grade MESH Networks) conducted in Madrid on March 3rd and 4th has been concluded with excellent results. Testbed demonstrations and presentations won the approval of European Commission reviewers present for their successful account of the project's research objectives.

The performance of theoretical presentations supported by on-site demonstrations goes in hand with CARMEN's aim to design and validate sound functionalities that can be implemented on a use-case practical basis, and adapting to the specific coverage/capacity requirements of mobile and fixed network operators.

Whilst 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 are not always available), mesh networks, in turn, are typically very reliable as they are "self-healing", (each node in the network may act as an independent router, which means that the network is still able to operate when a node breaks down or the connection fails). Thus, CARMEN project proposes carrier grade wireless mesh networks as an alternative and complementary fast and low-cost access technology to the common-core and multiple-access network infrastructure characteristic of future telecommunications.

Mesh-based solutions are particularly well suited to temporary scenarios or incremental deployments as they provide an economical network infrastructure, reusable and adaptable to short-time demands, and significantly easier and faster to deploy than current backhaul solutions. Scenarios which may greatly benefit from the outcome of the CARMEN project are, for instance, emergency events, such as natural disasters, where the challenge of providing a massively increased number of fixed and mobile wireless users with high quality triple- (high-speed Internet access, television and telephone) and quad-play (integrating mobility, for example, WiFi) services for the duration of the event, requires the deployment of heterogeneous and complementary technologies that are able to ensure efficient service delivery of at least the typical carrier grade service offerings: voice, video and data.

CARMEN project proposes to achieve the advancement of state-of-the-art mesh networks in the following aspects: Firstly, with the creation of a cost-effective mesh network that supports ubiquitous, triple and quadplay carrier grade services, that is, services offering quality levels comparable to those of carrier companies, and including hardware, availability, clustering, security, operation and performance. Secondly, support for mobile unicast and broadcast services in a mesh environment aimed at maximizing bandwidth costs. Thirdly, support for

multiple radio technologies, by designing an interface to provide an abstraction of radio based Media Access Control (MAC) layers for mesh, in order to expand the flexibility and compatibility of the network and bringing it closer to the ideal deliverable of a “ubiquitous” and “pervasive” service.

The findings of the CARMEN project will be presented in a joint proposal to international standardization bodies such as the IEEE and the IETF.

CARMEN Project is composed of the following organizations, representing the private and public sectors: [University Carlos III of Madrid](#), [AGH University of Science and Technology](#), [Alcatel-Lucent Deutschland AG](#), [British Telecommunications PLC](#), [Deutsche Telekom AG](#), [Fraunhofer Gesellschaft Zur Foerderung DerAngewandten Forschung E.V.](#), [NEC Europe Ltd.](#), [University College Dublin](#), [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...

IMDEA Networks Institute
28918 Leganes (Madrid) Spain
Avda. del Mar Mediterráneo, 22

+34 91 481 6210
mediarelations.networks@imdea.org
www.networks.imdea.org

Twitter: [@IMDEA_Networks](#) | [Facebook](#) | [Instagram](#) | [Flickr](#) | [YouTube](#)