News Release 5G-Crosshaul

3 YEARS, 20 COMPANIES, 18 GROUNDBREAKING EXPERIMENTS: 5G-CROSSHAUL SUCCESSFULLY CONCLUDES MOST AMBITIOUS 5G TRANSPORT NETWORK R&D EFFORT TO DATE

European Union H2020 5G Public-Private Partnership 5G-Crosshaul Featuring Twenty-Company Consortium Delivers 5G Transport Network Solution Cementing European Leadership in Crucial 5G Area

Madrid, Spain. — May 28th, 2018 — A consortium of twenty industry-leading companies today announced the successful completion of a nearly three-year European Union Horizon 2020 project aimed at developing a 5G integrated backhaul and fronthaul transport network. After nearly three years, the project, 5G-Crosshaul, is now the de-facto concept for the 5G integrated fronthaul/backhaul transport network.

The 5G-Crosshaul consortium was selected in 2015 to develop a 5G integrated backhaul and fronthaul transport network that enables a flexible and software-defined reconfiguration of all networking elements in a multi-tenant and service-oriented unified management environment. The transport network flexibly interconnects distributed 5G radio access and core network functions hosted on in-network cloud nodes. This is achieved through the implementation of a control infrastructure using a unified, abstract network model for control plane integration and a unified data plane encompassing innovative high-capacity transmission technologies, as well as novel deterministic-latency switch architectures.

"It has been truly an honor to oversee one of the most ambitious 5G transport network research and development efforts to date," said Arturo Azcorra, Director of IMDEA Networks, Co-founder of 5TONIC, and Project Coordinator of 5G-Crosshaul. "The successful results of the 5G-Crosshaul project have advanced scientific knowledge and international standardization of 5G systems, and ultimately contributed to an increase in Europe's 5G global competitiveness."

The 5G-Crosshaul solution was demonstrated and validated through 18 experiments integrating multiple technology components from the partners. Real-world trials took place at sites in Berlin, Madrid, Barcelona and Taiwan, and delivered sub-millisecond latency, tens of Gbps throughput, and proven energy and cost savings up to 70%, depending on the deployment scenario. The trials also demonstrated fast service deployment time in the order of minutes, taking advanced of SDN and NFV concepts.

"The 5G-Crosshaul project has delivered a novel transport network that provides overall resource optimization and brings the CAPEX and OPEX investments to a reasonable ROI range," said Xavier Costa, Head of 5G Networks R&D and Deputy General Manager of the Security &

Networking R&D Division, NEC Laboratories Europe, and the Technical Manager of the project. "This project's major innovation has set the stage to deliver on the huge increased available bandwidth and ultra-low-latency required by the fifth generation of network technologies."

Following its final project review by independent experts appointed by the European Commission, the 5G-Crosshaul project was declared to "*have fully achieved its objectives and milestones and delivered exceptional results with significant immediate or potential impact*". The EU experts report highlighted "Significant results linked to dissemination, exploitation and impact potential", in particular:

- 91 papers - in several prestigious journals
- 74 presentations/panels/webinars, and 14 (Co-)organized workshops
- 28 demonstrations including at flagship events such as MWC'16 and MWC'17
- 35 normative contributions feeding into key standardization specifications of eCPRI, G.metro, IETF CCAMP, IETF DETNET, and ONF
- 25 contributions for information purpose in several standardization bodies and fora such as NGMN, ITU-T, FSAN, ETSI, IEEE, BBF, ONF.

The EU experts report continued to note that "*several key innovations have been identified, and some of them have been mapped to products for exploitation. The project has so far registered five patent applications. Future exploitation plans are expected to emerge by the partners, outside the project umbrella and based on these innovations*."

"Throughout its lifetime, the 5G-Crosshaul project has successfully delivered 60-plus technological and informational contributions to the advancement of 5G standards," said Paola Iovanna, Ericsson, and the Innovation Manager of the project. "The project produced radical technology innovations, several directly mapped to products, setting this project as one of the most groundbreaking and unique projects to date."

Visiona contributed to the 5G-Crosshaul project by developing the TVBA, TV Broadcasting Application, and a virtual quality probe that analyses video QoS and QoE.

The TVBA uses the 5G-Crosshaul platform to deploy and provide a full broadcasting environment in seconds. Additionally, the TVBA deploy a virtual quality probe in the last node of the network, just before the user. This allows the TVBA from a non-intrusive manner to know the quality of the video the user is receiving. In case that the QoS or QoE metrics don't meets the expectations, the TVBA is able to act over the network and reconfigure the network path from the source to the users.

The TVBA rely on Openbaton as the MANO software that interacts with the Openstack as a VIM to deploy our VNFs in the selected nodes as needed. The VNFs defined and developed in the TVBA are:

- Virtual Quality Probe: detect QoS and QoE errors without referent image as color errors, packet loss, freezing, audio errors and total video loss.
- Virtual Video Headend: streams the video the users receive.

OpenDayLight is the SDN controller that allow the TVBA to set new and reconfigure the network paths to connect the video headend to the users.

A friendly web interface is in charge of presenting the full solution so the tenant that is operating the TVBA can with see the full network and deploy and provide services in some clicks.

For more information on the 5G-Crosshaul project, please write at: info@visiona-ip.es