



TELEFÓNICA JOINS FORCES WITH ALTIOSTAR, GIGATERA COMMUNICATIONS, INTEL, SUPERMICRO AND XILINX FOR THE DEVELOPMENT AND DEPLOYMENT OF OPEN RAN IN 4G AND 5G

- **The collaboration comprises the necessary design and developments, integration efforts, operational procedures and testing activities required to materialize Open RAN in our networks.**

Madrid, March 18th, 2020. – Telefónica has announced an agreement that it is driving a strategic ecosystem collaboration with Altiostar, Gigatera Communications, Intel, Supermicro and Xilinx, Inc., to foster the development of Open RAN technologies in 4G and 5G. With this collaboration, Telefonica will launch 4G and 5G Open RAN trials in UK, Germany, Spain and Brazil this year.

Telefónica, as part of our continued efforts to lead the network transformation towards 5G, is progressing this collaboration towards the design, development, optimization, testing and industrialization of Open RAN technologies across its footprint this year. Open RAN represents a paradigm change in network technology where radio baseband hardware is based on standard servers, interfaces between network equipment are open and standardized by the O-RAN Alliance, and the baseband software runs in the Telco Cloud by adopting the Automation and Zero-Touch capabilities that the NFV/SDN paradigm can bring.

The collaboration focuses on the appropriate Distributed Units (DUs) that implement part of the baseband radio functions using the FlexRAN software reference platform and Intel® Xeon® processor based servers, appropriate Remote Radio Units (RRUs) connected through open interfaces based on O-RAN fronthaul specification, and suitable Software that manages the connectivity in an open Cloud RAN architecture.

Open RAN can bring substantial cost benefits thanks to the richer diversity of network suppliers that the model can bring, especially in terms of the baseband hardware where significant economies of scale can be exploited from the IT Industry. A cloudified open radio access architecture can also enable faster software innovation and advanced features like network automation, self-optimization of radio resources, coordination of radio access nodes, exposure to Third-Party Multi-access Edge Computing (MEC) applications through open Application Programming Interfaces (APIs), and integration with the virtualization activities at the Core and Transport networks, among others.

Openness of the network to Third-Party MEC applications is the cornerstone to bring added-value to the customers by enabling a variety of rich 5G services, like Virtual Reality (VR), Augmented Reality (AR), Online Gaming, Connected Car, or Industrial Internet of Things (IoT), among others. Edge-computing applications running in the Telco cloud can benefit from the strong capillarity of the access network, hence tailoring the service behavior to the instantaneous user conditions as well as the status of the live network

The main target is the prescription of the necessary hardware and software components in 4G and 5G, including testing the complete solution in the lab and in the field, integrating open RAN model as part of the end-to-end virtualization program (UNICA Next), maturing the operational model, and demonstrating new services and automation capabilities as offered by the Open RAN model. DUs and RRUs are designed with 5G-ready capabilities, hence being able to work in either 4G or 5G mode by means of a remote software upgrade. Identical hardware configurations exist for centralized and distributed network scenarios, hence exploiting the simplicity and economies of scale of the IT components. Finally, open

interfaces are at the core of the HW and SW development hence enabling seamless upgrades of specific parts of the network without impacting others, in a modular and future-proof way.

"Once again, Telefónica is leading the transformation towards having the best-in-class networks in our Operations with our customers as key pillars. Open RAN is a fundamental piece for that purpose while widening the ecosystem.", Enrique Blanco, **Telefónica** CTIO.

"Telefónica is known for its leading-edge network and has been championing open vRAN implementations to bring greater network service agility and flexibility," said Pierre Kahhale, **AltioStar** Vice President of Field Operations. "By bringing together the best-of-breed innovation, Telefonica is looking to achieve this vision into their network. We look forward to supporting this transformation of Telefonica's network."

"**Gigatera Communications** and Telefonica has been actively working to ensure state of the art technologies are being deployed. We truly value our partnership as we engage and revolutionize the industry.", Daniel Kim, President.

"Open RAN offers a way for service providers to enhance customer experiences and enable new revenue-generating applications," said Dan Rodriguez, vice president and general manager of **Intel's** Network Platforms Group. "We are collaborating closely with Telefonica and the broader ecosystem, and also participating in initiatives like the O-RAN Alliance, to help accelerate innovation in the industry."

"Supermicro is excited to partner with Telefónica, a premier telecommunications provider, to deliver server-class 5G solutions based on Open RAN architecture," Charles Liang, president and CEO of **Supermicro**. "Working closely with Telefónica on the deployment of 5G in the significant EMEA region, Supermicro's history of rapid time-to-market for advanced, high-performance, resource-saving solutions is a key component for the successful implementation of next-generation applications, especially as x86 compute designs migrate to the telco market."

"Xilinx is excited to collaborate with the disruptive mobile operator Telefónica as it leads the move to O-RAN" said Liam Madden, executive vice president and general manager, Wired and Wireless Group, **Xilinx**. "Our adaptable technology supports multiple standards, multiple bands and multiple sub-networks, providing Telefónica with a unique and flexible platform for radio, fronthaul, and acceleration for 4G and 5G networks."

About Telefónica:

Telefónica is one of the largest telecommunications companies in the world by market capitalization and number of customers with a comprehensive offering and quality of connectivity that is delivered over world class fixed, mobile and broadband networks. As a growing company it prides itself on providing a differential experience based both on its corporate values and a public position that defends customer interests. The company has a significant presence in 14 countries and 344 million accesses around the world. Telefónica is a 100% listed company and its shares are traded on the Spanish Stock Market and on those in New York and Lima.

About AltioStar:

AltioStar provides 4G and 5G virtualized RAN software solution that supports open interfaces and disaggregates the hardware from the software to build an open and secure multi-vendor web-scale network. This solution supports macro and small cells, indoor and outdoor, enabling interference management, carrier aggregation and dual reception to improve the efficiency of the network and enhances the Quality of Experience for the user while providing broadband speeds. Operators can add intelligence, quickly adapt the software for different services and automate operations to rapidly scale the network. More information is at www.altioStar.com.

About Gigatera Communications:

Gigatera Communications specializes in State-of-the-Art RF technologies including base station antennas and radios. Gigatera engineers, manufactures, and delivers high quality products focusing on reliability and performance while pioneering new technologies for the wireless communications industry. Products are 5G ready with emphasis on O-RAN standards. Gigatera's headquarter and R&D center is located in Fullerton, California.

About Super Micro Computer, Inc.:

Supermicro (Nasdaq: SMCI), the leading innovator in high-performance, high-efficiency server technology, is a premier provider of advanced Server Building Block Solutions® for Data Center, Cloud Computing, Enterprise IT, Hadoop/Big Data, HPC and Embedded Systems worldwide. Supermicro is committed to protecting the environment through its "We Keep IT Green®" initiative and provides customers with the most energy-efficient, environmentally-friendly solutions available on the market.

About Xilinx:

Xilinx develops highly flexible and adaptive processing platforms that enable rapid innovation across a variety of technologies – from the endpoint, to the edge, to the cloud. Xilinx is the inventor of the FPGA, hardware programmable SoCs and the ACAP, designed to deliver the most dynamic processor technology in the industry and enable the adaptable, intelligent and connected world of the future. For more information, visit www.xilinx.com.