

Media Release

(For MWC2018, February 27, 2018)

Industry Leaders Launch ORAN Alliance

Today, AT&T, China Mobile, Deutsche Telekom, NTT DOCOMO, and Orange jointly announced the creation of the ORAN Alliance. The ORAN Alliance is a world-wide, carrier-led effort to drive new levels of openness in the radio access network of next generation wireless systems. ORAN will combine and extend the efforts of the C-RAN Alliance and the xRAN Forum into a single operator led effort.

As mobile traffic increases, mobile networks and the equipment that runs them must become more energy efficient (green), software-driven (soft), virtualized, flexible, and intelligent. The ORAN (Open Radio Access Network) Alliance is committed to evolving radio access networks— making them more open and smarter than previous generations. Real-time analytics that drive embedded machine learning systems and artificial intelligence back end modules will empower network intelligence. Additional virtualized network elements with open, standardized interfaces will be key aspects of the reference designs developed by the ORAN Alliance. Technologies from open source and open whitebox

network elements will be important software and hardware components of these reference designs.

By combining and extending the objectives of the C-RAN Alliance and the xRAN Forum, the key principles of the ORAN Alliance include:

- Leading the industry towards open, interoperable interfaces, RAN virtualization, and big data enabled RAN intelligence.
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- Maximizing the use of common-off-the-shelf hardware and merchant silicon and minimizing proprietary hardware.
- Specifying APIs and interfaces, driving standards to adopt them as appropriate, and exploring open source where appropriate.

“ORAN represents a comprehensive embodiment of Communication 4.0 and is empowered by the true Information, Communications and Data Technology (ICDT) convergence,” said Zhengmao Li, CTO of China Mobile. “It will drive the radio access network from Green and Soft to Open and Smart. And ultimately operators will expect future networks to be built with deeply

embedded intelligence, much higher efficiency, lower cost, great agility and flexibility, and all at manageable complexity.”

“To take full advantage of the flexibility of 5G, we have to go beyond the new radios and change the overall architecture of the end-to-end system,” said Andre Fuetsch, President AT&T Labs and Chief Technology Officer. “Open modularity, intelligent software defined networks, and virtualization will be essential to deliver agile services to our customers. ORAN will accelerate industry progress in these areas.”

“For 5G to unlock new business opportunities and markets, it is essential that we evolve a RAN infrastructure platform that allows us to innovate quickly to meet customer expectations. The ORAN approach, to drive more openness, modularity and programmability in our future networks, can enable a more agile delivery of services to our customers,” said Alex Jinsung Choi, SVP Research & Technology Innovation, Deutsche Telekom. “We are excited that the ORAN Alliance will build on and continue the journey we started in X-RAN to extend the capabilities of RAN technologies and enable next generation open implementations.”

“5G is expected to facilitate the creation of new vertical markets, the speed of which will be accelerated by the high flexibility and high intelligence derived from open APIs and interfaces,” said Dr. Hiroshi Nakamura, EVP and CTO of NTT DOCOMO. “We have experienced that openness can provide opportunities for expanding markets. We believe that ORAN will evolve open and cost effective radio access networks and that it will further advance them into the next stage.”

“In order to respond to the growth of demanding business capabilities and affordable systems, 5G radio sub-networks need to evolve towards more flexible, open and smarter solutions,” said Emmanuel Lugagne, SVP Orange Labs Networks. “The work of the ORAN alliance will be a perfect driver for the industry to help achieve these promises.”

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About AT&T

AT&T Inc. (NYSE:T) helps millions around the globe connect with leading entertainment, business, mobile and high speed internet services. We have the nation's largest and most reliable network** and the best global coverage of any U.S. wireless provider. We're one of the world's largest providers of pay TV. We have TV customers in the U.S. and 11 Latin American countries. More than 3 million companies, from small to large businesses around the globe, turn to AT&T for our highly secure smart solutions.

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About China Mobile

China Mobile Limited (the "Company", and together with its subsidiaries, the "Group") was incorporated in Hong Kong on 3 September 1997. The Company was listed on the New York Stock Exchange ("NYSE") and The Stock Exchange of Hong Kong Limited ("HKEX" or the "Stock Exchange") on 22 October 1997 and 23 October 1997, respectively. The Company was admitted as a constituent stock of the Hang Seng Index in Hong Kong on 27 January 1998.

As the leading telecommunications services provider in Mainland China, the Group provides full communications services in all 31 provinces, autonomous regions and directly-administered municipalities throughout Mainland China and in Hong Kong Special Administrative Region, and boasts the world's largest mobile network and the world's largest mobile customer base. Its businesses primarily consist of mobile voice and data

business, wireline broadband and other information and communications services. As of 31 December 2016, the Group had a total of 460,647 employees, 849 million mobile customers and 77.62 million wireline broadband customers with its annual revenue exceeding RMB700 billion.

About Deutsche Telekom: [Company profile](#)

About NTT DOCOMO

NTT DOCOMO, Japan's leading mobile operator with over 75 million subscriptions, is one of the world's foremost contributors to 3G, 4G and 5G mobile network technologies. Beyond core communications services, DOCOMO is challenging new frontiers in collaboration with a growing number of entities ("+d" partners), creating exciting and convenient value-added services that change the way people live and work. Under a medium-term plan toward 2020 and beyond, DOCOMO is pioneering a leading-edge 5G network to facilitate innovative services that will amaze and inspire customers beyond their expectations. DOCOMO is listed on stock exchanges in Tokyo (9437) and New York (DCM). www.nttdocomo.co.jp/english.

About Orange

Orange is one of the world's leading telecommunications operators with sales of 41 billion euros in 2017 and 152,000 employees worldwide at 31 December 2017, including 93,000 employees in France. Present in 29 countries, the Group has a total customer base of 273 million customers worldwide at 31 December 2017, including 211 million mobile customers and 20 million fixed broadband customers. Orange is also a leading provider of global IT and telecommunication services to multinational companies, under the brand Orange Business Services. In March 2015, the Group presented its new strategic plan "Essentials2020" which places customer experience at the heart of its strategy with the aim of allowing them to benefit fully from the digital universe and the power of its new generation networks.

Orange is listed on Euronext Paris (symbol ORA) and on the New York Stock Exchange (symbol ORAN).

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