

Is open RAN the future for radio access technology?



Why are some people calling for a more open radio access network (RAN) architecture? In this post and accompanying video, LSE's [Jean-Christophe Plantin](#) explains why there has been a move to disaggregate some of the key technology that the telecommunications industry relies on, and the challenges and implications of this.

Watch Jean-Christophe explain more about the origins of open RAN

Engineers who designed the [open RAN \(Radio Access Network\)](#) model in 2016 as an alternative architecture to existing [cellular base stations](#) surely did not imagine that the two next US presidents would become their most dedicated supporters. In 2019, then President Trump [ordered a ban on Huawei or ZTE technologies](#) for existing and future US-based telecom networks, resulting in a massive “rip and replace” campaign to

remove any components from these vendors. The quest for new equipment vendors led the industry and the government to look for alternatives, hereby putting the open RAN model—until then known mostly to engineers—on the main stage. The US is now trying to export open RAN beyond its own market, as evidenced in 2022 when current US president Joe Biden [directly promoted it](#) during [his state visit to the Saudi Arabia](#).

What is open RAN?

The RAN designates the telecom components that wirelessly link our cell phones and other connected devices to the rest of the internet network. In its most visible form, it encompasses the cell towers (or radio units) that we see on top of buildings, as well as the various hidden devices (baseband unit) transmitting the radio equipment to the backhaul network of the internet.

Telecom network operators have long complained about this part of the network. Nokia, Ericsson, and Huawei control approximately 80% of the RAN market, keeping prices high and—according to operators—keeping the pace of innovation low. The roll out of 5G networks, which will require a massive increase in cell towers to power Internet of Things, AR/VR and autonomous vehicles, has led to a quest to lower the price of the RAN. These complaints led to the creation of the Open RAN architecture in 2016 via a dedicated working group as part of the Telecom Infra Project. The O-RAN Alliance and the Open RAN Policy Coalition quickly followed to support a wider adoption of the model.

The call for open interfaces is a recurring trend in the telecommunication industry and RAN reminds us of [the “intelligent networks” of the 1990s](#). What differentiates open RAN is how quickly the US included it in its geopolitical agenda, and how it influenced partners and allies to do the same. Starting in 2020, the US government has rolled out a series of measures to actively promote the open RAN model over its territory, among others, the [Utilizing Strategic Allied \(USA\) Telecommunications Act](#), which requires the FCC to create a \$750M grant scheme to create a research & development fund dedicated to open RAN. In 2022, the UK Department of Digital, Culture, Media and Sport issued a series of [Open RAN principles](#) and in 2023, Digital Catapult and Ofcom launched [an Open RAN testing facility](#) to drive the technologies to market. The European Commission is not actively promoting open RAN, but some member states are, such as Germany where the federal government allocated part of its €130 billion stimulus in 2021

[specifically to open RAN development.](#)

What are the associated challenges?

This impressive momentum is yet to be considered in light of the challenges that the open RAN model brings.

- **Using Open RAN to achieve geopolitical and economic goals is fraught**

Much political support of this technology comes down to reducing the part played by Chinese firms in the global telecom market—continuing an “America First” agenda that we see unfolding around micro-processors, subsea cables, and even social media applications. What is fundamentally different with open RAN is that since it is an open-source architecture (and not one single product sold by one firm), it is developed via consortia with voluntary participation of many different companies—in the case of open RAN, the O-RAN alliance and the 3GPP. In these two bodies, engineers working at Chinese vendors companies are already massively present, sometimes the second contributors. Shutting them out of these consortia would be nearly impossible and would seriously harm the technological development and future success of the RAN. As a fantastic paradox, Chinese firms are therefore massively involved in developing the technologies that the US actively promotes to try to shut out Chinese companies from the international market.

- **The future of open RAN is uncertain**

While the architecture is promoted as the future of telecommunications networks, it still is at a very nascent stage, being currently tested in just a few real-world networks. Commentators and EU experts [have highlighted](#) the security risks that emerge when opening up more interfaces to external development (which opens up the surface threats). Others [have brilliantly shown](#) how the reliance on the cloud to roll out open RAN brings all the security vulnerability of the cloud. Finally, despite major EU telecom companies teaming up in [a memorandum of understanding](#) to convince EU stakeholders to fasten the development of open RAN, it might be already too late to make this technology central to future 6G network deployment.

Cloud Giants: the real winners of open RAN?

Will all this governmental support lead to the massive implementation of open RAN in future networks? This will depend on the willingness of both operators and vendors to adopt the trend. Thinking more broadly, the cloud giants (Google Cloud, AWS, Microsoft Azure) might be the real winners. Open RAN aims to increase the capacity to manage a high number of cell towers in a centralised way via software. Adopting the cloud to do so allows operators to really reap the benefit of Open RAN. Cloud providers are already managing, [sometimes even buying altogether](#), increasing sections of the telecom infrastructure. Open RAN might very well be a way for cloud giants to increase their power over the infrastructure of our future digital lives.

Learn more about Jean-Christophe's research into telecom networks here:

Plantin JC. (2021) "[The geopolitical hijacking of open networking: the case of Open RAN](#)" European Journal of Communication. Vol. 36(4), pp. 404–417

Mansell R., Plantin JC. (2022) "[Imagining 5G Networks: Infrastructure and Public Accountability](#)" International Journal of Communication, Vol. 16, pp. 4825-4843

This post represents the views of the author and not the position of the Media@LSE blog nor of the London School of Economics and Political Science.

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