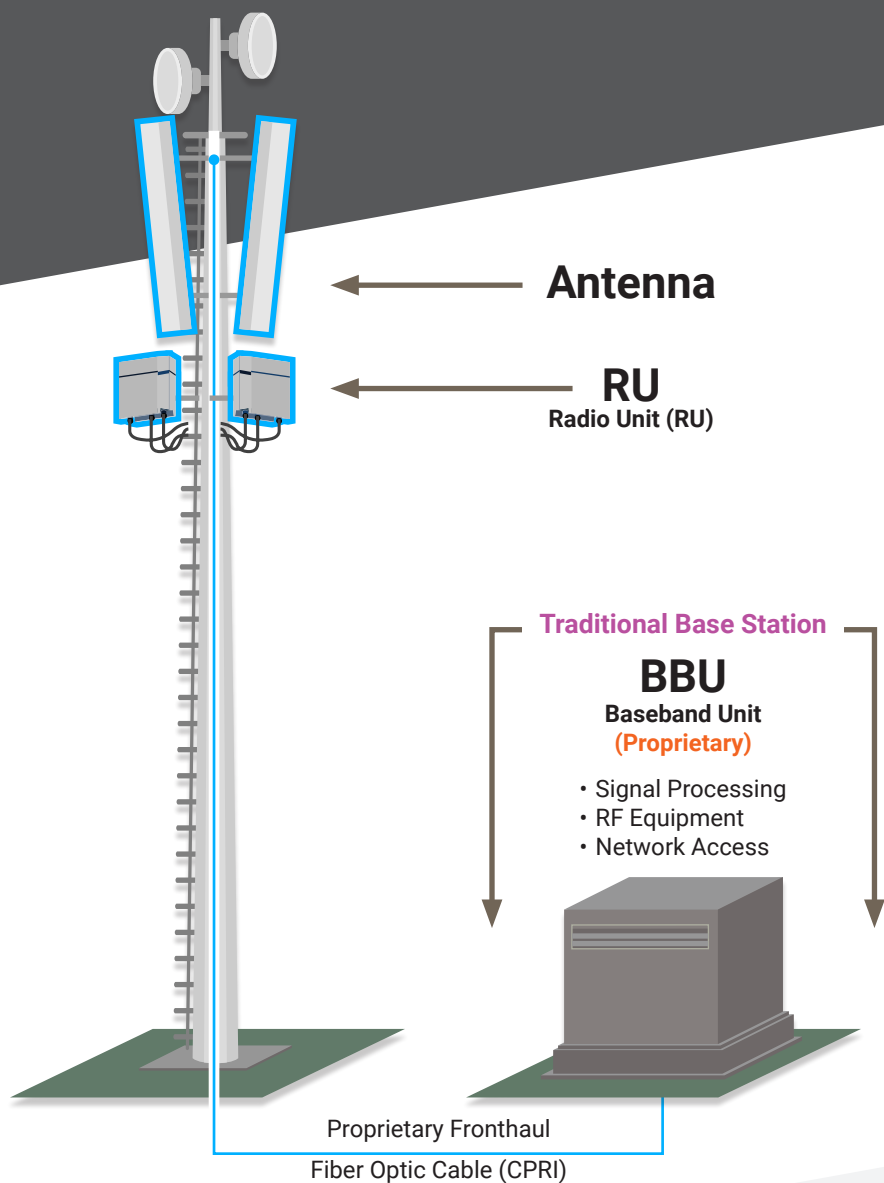


What is Open RAN?

Open Radio Access Networks, or Open RAN, refers to a disaggregated approach to deploying mobile networks by using open and interoperable protocols and interfaces, which allows for increased flexibility over traditional RAN systems. Open RAN can be implemented with vendor-neutral hardware and software-defined technology based on open interfaces and industry-developed standards.

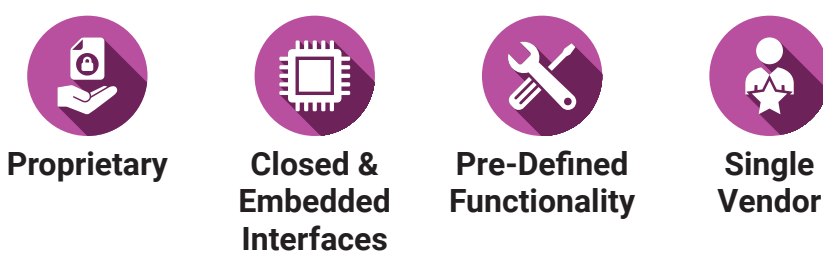


TRADITIONAL RAN

In a traditional RAN system, the radio, hardware and software are **proprietary**. This means that nearly all of the equipment comes from one supplier and that operators are unable to, for example, deploy a network using radios from one vendor with hardware and software from another vendor.

Mixing and matching cell sites from different providers typically leads to a performance reduction. The result is that most network operators, while supporting multiple RAN vendors, will deploy networks using a single vendor in a geographic region.

This can create vendor lock-in with high barriers to entry for new innovators.



OPEN RAN

Open RAN is not a technology, but rather an ongoing shift in mobile network architecture that allows networks to be built using subcomponents from a variety of vendors. The key concept of Open RAN is “opening” the protocols and interfaces between the various subcomponents (radios, hardware and software) in the RAN. As a technical matter this is what the industry refers to as a disaggregated RAN. The benefits of this approach include increased network agility and flexibility, increased innovation and cost savings.

There are three primary elements in the RAN:

- 1 **The Radio Unit (RU)** is where the radio frequency signals are transmitted, received, amplified and digitized. The RU is located near, or integrated into, the antenna.
- 2 **The Distributed Unit (DU)** is where the real-time, baseband processing functions reside. The DU can be centralized or located near the cell site.
- 3 **The Centralized Unit (CU)** is where the less time-sensitive packet processing functions typically reside.

It is the interfaces between the RU, DU and the CU that are the main focus of Open RAN. **By opening and standardizing these interfaces (among others in the network), and incentivizing implementation of the same, we move to an environment where networks can be deployed with a more modular design without being dependent upon a single vendor. Making these changes can also allow the DU and CU to be run as virtualized software functions on vendor-neutral hardware.**

