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Extension of Radio-over-Fiber to the latest applications requests

The talk will analyze the newest applications of Radio-over-Fiber (RoF) systems. Although RoF is a relatively simple system and it has been on the market for years, still there is room for new nuances, driven by the pushing requests coming from diverse application fields, and fueled by the latest technological advancements.

With reference to Fig.1, we will analyze two potential specific applications of analog RoF systems for next-generation wireless base stations:

- the direct distribution of signals between the BBS and the massive MIMO antenna array, and
- the direct connection between the BBS and the backhauling antenna.

In our analysis based on real-case requirements and on simulations run using experimental data, these specific RoF systems seem able to meet the main requirements of the reference applications, thanks to the constant improvement of photonic technologies.
Although the RoF solutions implies a cost in terms of loss and noise figure, the benefit that a fiber-based approach can bring into the newest wireless base stations can overcome those costs, allowing to confine power-hungry digital electronics in the Base Station Server, and bringing simplified installation and reduced SWaP.
The predicted results are made possible mainly by the newest technologies of photonic integration.

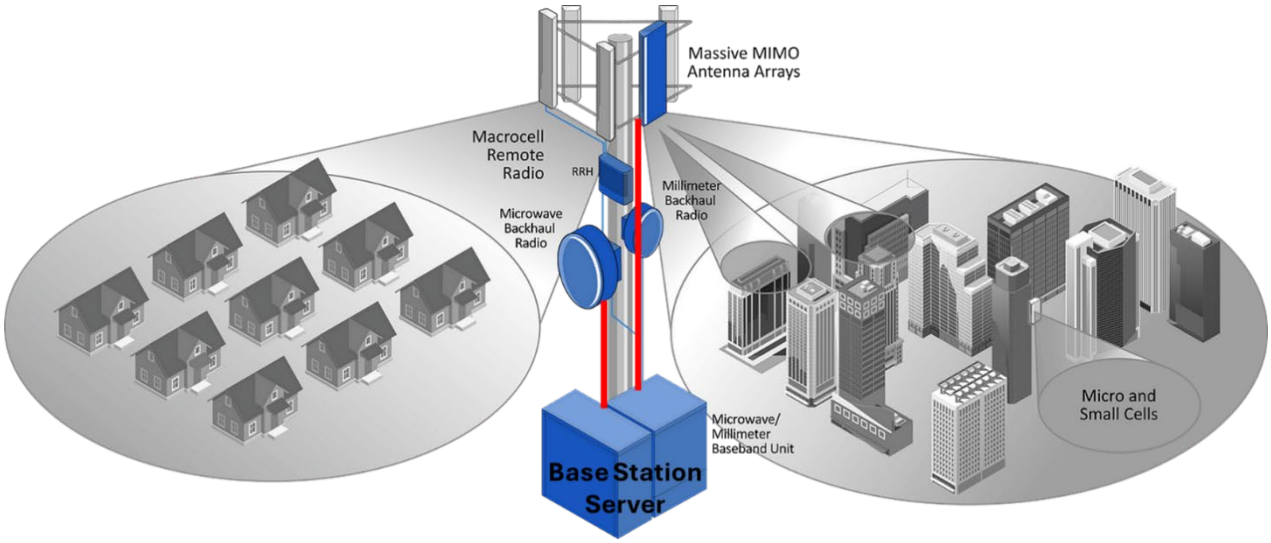

Figure 1: General architecture of a wireless base station. The possible RoF connections between the Base Station Server and the antenna array or the backhauling system are highlighted in red. Original image taken from www.maxlinear.com.