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LTE performance will hinge on picocell backhaul

CTIA Wireless news: New products will drive microcell architectures, ensure throughput

By [John Cox](#), Network World

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Mobile carriers have been building out beefed-up backhaul connections between their cell towers' [3G](#) base stations and their core networks. But the advent of [LTE](#) networks is accelerating a new backhaul problem: connecting a growing number of smaller base stations to the core.

The U.S. cellular industry's CTIA [Wireless](#) conference in Orlando this week highlights how heavily networks will depend on these more compact radios, partly to extend or fill in coverage, but more importantly to increase capacity and throughput for mobile data users. By definition, microcells are more numerous than the traditional, powerful macrocells, but they have one thing in common: Like their larger radio cousins, each one needs a wired or wireless connection back to the core.


CTIA: [New gadgets, LTE upstarts and data plans on tap](#)

This week, and last month at the Mobile World Congress show in Barcelona, a number of vendors introduced either small base stations that support a range of affordable backhaul options or backhaul products specifically designed to link these base stations with the core. Some of these base stations also incorporate a 802.11n Wi-Fi access point, which can use the same backhaul connection, offering subscribers a choice between cellular and Wi-Fi connectivity.

Powerwave Technologies is announcing a compact indoor LTE picocell with an integrated two-radio 802.11n access point for Wi-Fi clients. It can use Ethernet, metro Ethernet or the hybrid fiber coax (HFC) used by cable TV providers for the backhaul connection.

"By the end of 2011, the carriers will see LTE hotspots, where users concentrate," says Juan Santiago, VP of product management for Powerwave, Santa Anna, Calif. Adding another base station to a cell site, to do cell splitting, is a

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costly, complex and often lengthy process. Picocells that can make use of readily available backhaul options can let carriers add capacity to hotspots quickly, according to Santiago.

The indoor unit is 14-by-7-by-2 inches, and weighs just under 5 pounds. The outdoor model can covers about 900 feet, or about three city blocks. The new indoor model is intended to have the same LTE coverage as 11n Wi-Fi access points, says Santiago. It runs on DC power and Powerwave provides an AC/DC converter that lets installers tap into a nearby AC electrical line. Both models offer aggregate data throughput of 100Mbps, enough to support up to 100 active users concurrently, and up to 1,000 registered users, according to Powerwave.

The new picocell line supports all 4G frequencies in the 700 MHz to 2.7 GHz range. It will be available in September, following fields trials this summer. Powerwave declined to comment on pricing.

BelAir Networks is announcing a similar LTE/11n picocell, an outdoor model that can be up and running in 15 minutes, according to the vendor. Like Powerwave, BelAir supports a range of backhaul options, including hybrid fiber coax, but also including high-performance switched wireless mesh.

Bridgewave, another backhaul radio vendor, is unveiling a line of radios, dubbed PicoHaul, specifically created to link numerous LTE picocells to a carrier's network.

The first model is the outdoor PG60C. It's designed to mount quickly and unobtrusively on light poles or the sides of buildings, and eliminates the use of dish-shaped antennas. It uses the millimeter wave frequency bands, specifically the 60 GHz band, to create a high-capacity, spectrally efficient backhaul radio link, in many cases without license fees.

Exalt Communications, Campbell, Calif., announced its new Air Series, which is a line of outdoor, "fiber-quality" microwave backhaul radios. The radios support the 2 GHz to 43 GHz bands, plus nontraditional bands including LMDS (such as 28 GHz), 24 GHz, 24 GHz DEMS and 42 GHz, which gives a carrier additional spectrum options for backhauling picocell traffic. The Air Series requires no internal cabinet space or cooling, and the unit has been designed to wring the most out of available spectrum.

John Cox covers wireless networking and mobile computing for *Network World*.

Twitter: <http://twitter.com/johnwcoxnww>

Email: john_cox@nww.com

Blog RSS feed: <http://www.networkworld.com/community/blog/2989/feed>

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