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DAS vs. small cells for in-building wireless

By Sean Kinney, Editor in Chief on MAY 30, 2017

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The need for robust in-building wireless systems for enterprise users is well-established. The vast majority of mobile traffic originates inside buildings, and, particularly in the context of an office, retail center, hospital or other enterprise environment, the common approach of providing coverage from the outside-in just isn't enough.

To understand the tremendous potential related to in-building wireless systems, consider the multi-billion-dollar growth outlook provided by industry research firms. Austin, Texas-based ABI Research, in a report published last year, projected the in-building wireless market to exceed an annual value of $9 billion by 2020 with North America leading in spending. That's a conservative estimate compared to forecasts published by Markets and Markets, which pegged the 2015 in-building wireless market as worth $4.83 billion and estimates a compound annual growth rate of 28.1% to a yearly value of $16.71 billion in 2020. Researchers with Markets and Markets hit on the increasing prevalence of mobile-first enterprise users as "businesses realize the impact of pervasive coverage and effective communication environment on individuals' productivity."

One key challenge faced by enterprise decision makers is technology selection, which can be tricky in terms of striking the appropriate balance between needs, cost, complexity and other factors. Cellular in-building wireless solutions include distributed antenna systems (DASs) and small cells.

DAS for the enterprise

Distributed antenna system vendors are working to the make products more enterprise-friendly by reducing the cost of complexity while still providing the multi-operator, multi-band support that's needed by many businesses who have embraced the bring-your-own-device trend and adopted bandwidth-intensive applications such as a real-time workflow sharing, video conferencing and other tools.

Tim Moynihan, vice president of marketing, SOLiD Technologies, said, for the enterprise, user experience is key. "We tend to talk about technology," he said. "Let's talk about user experience, let's talk about what the enterprise IT departments want. It's all about the application; it's all about the user experience and how it's

supported by enterprise IT. They want happy customers, they want a happy CEO, they don't want to take [complaint]phone calls. They want to manage it, work with it and work with as few vendors as possible."

To enable a user-friendly, easy-to-manage DAS solution, during Mobile World Congress 2017, SOLiD launched its GENESIS platform, which includes four primary components: the DAS infrastructure, a virtualized Radio Access Network signal source, cloud-based management, and a Marketplace application, which enables what SOLiD refers to as a "supply meets demand" relationship between system owners and wireless service providers.

CommScope has also addressed the need to take cost and complexity out of DAS for the enterprise with its ION-E, which uses standard IT cabling to speed installation time, while serving as a unified wireless infrastructure platform that supports gigabit Ethernet backhaul over a common cabling infrastructure, as well as power over Ethernet and a compact head end. In addition to cellular, ION-E also serves as a platform for connectivity and management of other systems like Wi-Fi or IP-based cameras.

"What we have done is really tried to nail down the requirements of the enterprise environment," Luigi Tarlazzi, director of product line management, Small Cells, for CommScope's Distributed Coverage and Capacity Solutions group, said. "Our digital DAS platform is really targeted for these types of enterprise environments. Using the digital technology on signal processing and signal transport, we feel like we've been able to address key requirements. We also tried to leverage as much as possible the IT infrastructure that's already there–simplifying the commissioning of the system, trying to avoid the need for an army of RF engineers on site to solve a problem."

What about small cells?

Small cell deployments have seen increasing adoption particularly to supplement the outdoor network by providing pinpoint capacity in high-traffic areas via antennas placed on rooftops, the exterior of buildings, on lighting or utility poles and even hidden in street furniture. In the in-building space, small cells are gaining interest for enterprise applications given the ease of installation, although the major drawback is the lack of a true multi-carrier small cell that supports, in the U.S., the four major service providers on a shared infrastructure. What's available now is largely custom concealment solutions that place multiple radios into a single unit to minimize aesthetic concerns in a building.

Speaking to how CommScope approaches its enterprise small cells, Tarlazzi said, "We are really trying to simplify the deployment and minimize the cost." That involves using Ethernet fronthaul, off-the-shelf switches and cabling, and introducing automated optimization techniques that maximize network and spectral efficiencies. The OneCell enterprise small cells is based on a cloud radio access network (C-RAN) architecture comprising a baseband controller and multiple radio points.

Gap Wireless President Bouvrette noted that, for some time, actual deployments of small cells have fallen short of many analysts' predictions. "We've been hearing about small cells for I'd say probably the past five years and really we're only starting to see some massive deployments in the last 12 to 18 months," he said. "The concept of small cells is not new; the availability of them is a little bit more recent. I think there's been a lot of augmented capacity outdoors, so like festival areas, places where you have large congregations of people coming together and you might have a capacity crunch coming from the macro. Now that carriers have the experience of the small cells in the macro...I think the next step is definitely going to be to move those types of deployments in-building."

Given all the technological and business-related variables associated with increasing in-building network density, Wireless 20/20 Senior Analyst and Principal Consultant Randall Schwartz came back again and again to a shared infrastructure model that has been used at the macro layer to provide near-nationwide coverage in the U.S.'s challenging geography. "What happens if you take that model and expand it? Maybe someone puts out public small cells, for example, and if an operator needs capacity, they tap into it. This whole shared infrastructure theme can be extended from outside to an in-building network."

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