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Big Business in Small Cell Backhaul

John Edwards, Technology Journalist, 1/24/2013

As the number of data-oriented mobile devices grows, mobile network operators are struggling to meet capacity demands. Despite the arrival of advanced 4G/LTE mobile networks, most carriers realize that other solutions are needed to maintain acceptable capacity, security, and quality levels.

One way carriers have addressed this challenge is by installing small cells (including microcells, picocells, and femtocells) within their networks. Small cells operate at higher frequencies and provide greater bandwidth than their traditional "macro" counterparts. Costs are reduced as small cells circumvent the need to deploy cumbersome and expensive new base stations.

Yet implementing small cell configurations raises new challenges for mobile carriers' backhaul planning and operations teams. Traditional fixed-line backhaul approaches are perfectly suited for small cell applications, yet their use is limited by a general lack of copper and fiber availability, as well as by the need to deploy bulky base stations on lampposts, telephone poles, and other structures that aren't particularly friendly to wireline access. To get around this problem, carriers are increasingly selecting wireless solutions to enable small cell traffic backhauls.

A study released in December by Infonetics Research predicts an upcoming boom in small cell backhaul gear. "We expect a cumulative $5 billion to be spent worldwide on outdoor small cell backhaul equipment between 2012 and 2016, with the market kicking into high gear in 2014," said Michael Howard, Infonetics co-founder and principal analyst for carrier networks, in a statement.

Yet when it comes to wireless backhauls, there is no "one-solution-fits-all" technology. Every type of wireless backhaul technology -- including microwave line of sight (LoS); millimeter wave LoS; mesh WiFi non-LoS; orthogonal frequency-division multiplexing non-LoS; and satellite -- has its pros and cons. It's up to each particular carrier to identify and deploy the wireless backhaul technology that best meets its needs.

Carriers deploying small cell system wireless backhauls face several challenges, including form-factor limitations, local regulations, available power resources, cost, and

even area weather conditions. Yet perhaps even more important, when backhaul moves from fiber and cable to wireless links, is the extra effort that carriers must make to secure their connections. While the wireless backhaul market is still quite small, and security isn't yet a major problem, it won't take long for attackers to figure out ways to divert or disrupt traffic for their own gains.

Now is the time for carriers to begin assessing their wireless backhaul risks and to start planning a strategy to meet the security challenge. While companies such as BTI Systems already offer secure wireless backhaul solutions, carriers need to understand that a rapidly growing number of small cells will create an infinitely larger number of attack vectors, as well as more opportunities for attackers to intercept communications unnoticed.

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