Wireless Backhaul – A World of Its Own

By Hunter Newby

Making the case for fiber to the carrier hotel, data center, business-park, building, curb and home gets more difficult and increasingly in that order, but when Fiber to the Tower enters the equation the math gets a little fuzzy. A gross misconception is that wireless somehow competes with or eliminates the need for fiber altogether. On the contrary, wireless drives the need for fiber and other forms of physical transport. (As the diagram on this page clearly shows the wholesale access network sits between wireless carriers facilitating their interconnection.) The problem with fiber to the tower is not with the technology, or physics of the process. It is with the physical location of the towers.

Wireless towers are scattered about as if they were placed wherever the owners could get the best deal on a lease for land without any regard for access to fiber for backhaul transport and only having access to T1 and DS3 transport to the major switching centers. Oh wait second…that is exactly how it happened!

In a December 2008 Report on Wireless Backhaul NPRG states: *"Consumer enthusiasm for mobile web services and rich media applications is accelerating, and will continue to do so as 4G services like WiMAX and LTE become widespread. But given the physical limitations of legacy TDM access circuits, wireless carriers are looking to backhaul alternatives to meet projected demand".*

In addition, the wireless backhaul section of the FiberTower website (www.fibertower.com) states: *"Backhaul – the portion of the network that runs from the cell site to the switch – is widely considered to be the "Achilles heel" of cellular networks. Today's TDM backhaul infrastructure, which hasn't been upgraded in two decades, has failed to keep pace with other network enhancements. This has inhibited growth, service quality and operational efficiencies."*

There are three reasons for not keeping pace:

1. Fiber is hard to come by out in the field. It costs a lot to build if you can even find a long haul or regional network to lateral off of.
2. The number/type of circuit orders required to breakeven is a tough hurdle to cross with an average of only 2.5 wireless service providers per tower in the US.
3. Even if the fiber can be brought to the tower the backhaul provider needs to colocate its equipment in a hut, or cell tower-based co-lo enclosure. These are typically owned by the wireless carriers themselves and
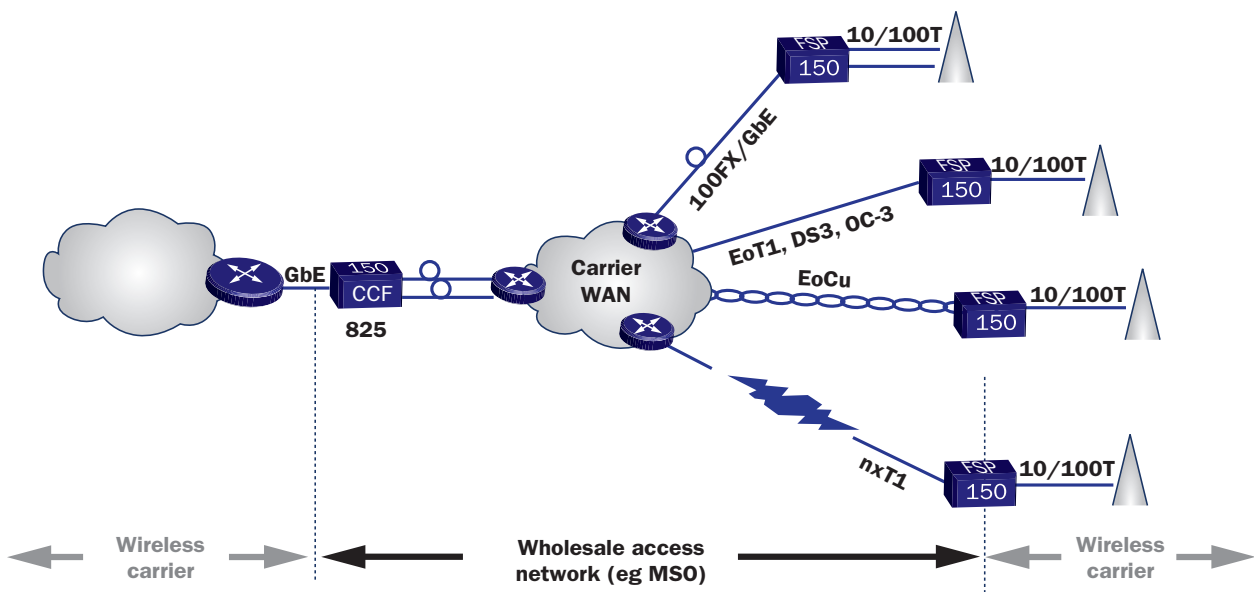
Source: ADVA Optical Networking

are not neutral. Therefore the carrier/owner of the hut will not allow the backhaul provider to cross connect to another wireless service provider out of its hut, which drives up costs, or flat-out blocks deals.

Can't find fiber, can't find neutral colocation – it sounds like New York City in 1982. The sad truth is that it is a modern day reality practically everywhere outside of the major urban areas today in the US. When the business case for fiber cannot be made for it to be brought to the tow-

vices either for themselves internally (an enterprise business, gov, edu, etc.), or to sell the lit service to other entities (enterprises, or other service providers, gov, edu, etc). As soon as a builder of fiber lights that fiber they typically no longer wish to actively seek leasing that fiber to other lit service providers as they now see them as competitors. If a service provider goes to the trouble of bringing fiber to a tower they want to be the one that sells the lit circuit to the wireless carriers. This only makes sense

wireless carriers, thus making the ROI easier to achieve

One agreement from a single operator that provides turn-key colocation/power, tower space and fiber would be very convenient and efficient, allowing the backhaul providers and wireless carriers to focus on what they do best: servicing their customers

New fiber is better than old fiber in general and it would support 4G and beyond applications.

Point to point wireless circuits to the

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er, the amount of transport capacity necessary for the next-gen applications to work does not materialize. This creates a bottleneck in evolution firmly planting a wedge in the contiguous order of all things networked and serves to entrench the digital divide and further perpetuate loss of time, value and intelligence. These are our most precious resources and they are wasted every day.

The deep, dark secret that keeps progress from happening is really the inherent conflict created between the "right products" for stimulation and shareholder value. The right products are neutral fiber, and neutral colocation. This means that the builder and owner of the fiber and colocation facilities leases them to others that wish to "light" the fiber themselves to provide "lit" ser-

as their ROI analysis is much easier/better with lit revenue than only leasing dark fiber to someone else that then gets the lit revenue.

This scenario is true if the financial analysis is to bring fiber out to an existing tower where there isn't any fiber currently. Some of those builds can be very difficult and costly. What if a new fiber route was built and on that route new towers and colocation huts were placed with an open-access real estate mentality. How could that help?

No laterals. Bringing fiber to the tower would cost much less and be easy – it's right there.

Neutral colocation huts would create a common, shared facility for interconnection making the backhaul provider's equipment accessible to multiple

remote towers with no fiber could be established on the towers that have ample fiber, thus extending the reach of high-speed backhaul

The benefits of a new way of thinking about the fiber, tower and backhaul business are clear. Hopefully a simple architecture can be adopted and deployed with a strict adherence to neutrality so that the model does not become corrupted and broken. If the model remains in tact then it will scale. With that scale we can expect new applications that have not even been thought of yet to be developed and made available to anyone within range a wireless tower with fiber. **IP**

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