Factor-in Femtocell Traffic

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Last week I wrote about the controversy that operators have triggered by including femto traffic into the data plan - i.e. you use up your quote even if using your femto on your broadband. The operators are pointing to legal issues, specifically to Lawful Intercept (LI, or CALEA for Communications Assistance for Law Enforcement Act), as a rationale.

Legally, they must support wiretap on 3G (but need not WiFi), so traffic goes into their core and not direct to internet.

Although the transmission is by ISP, but AT&T pay for router (SGSN etc) and peering/termination (instead of your ISP paying those costs)

This is discussed in Light Reading: http://www.lightreading.com/document.asp?doc_id=193482&f_src=lrdailynewsletter#msgs [1] with an interview of Gordon Mansfield, AT&T's executive director for radio access networks. It also includes some very good, informed debate.

Now, for all the uproar, there is logic here. According to Signals Research Group macro cellular HSPA costs in the range of $ 9.47 (capacity-constrained) to $ 7.53 (coverage-constrained) and femtocell costs of $ 2.39 per GB. These figures assume a traditional core network at 2008 costs, a 10% voice-oriented busy hour, and a backhaul network which, although it uses a mixture of microwave and metro-Ethernet, has a cost similar to that of an E1/T1 backhaul, because the traffic levels are modest. The numbers also assume that 100% of the voice and data traffic of the femtocell flows through the operator’s network which is how it works today.

Normally you pay your ISP and the fee covers both the connection and the traffic volume cost: but AT&T gets those costs (so perhaps you should get a rebate from the ISP..?!)

A technique called SIPTO (Selective IP traffic offload) would help: it allows a femtocell to connect to the internet more directly: managed by the core (hence ‘selective’) but with traffic not passing through it: ‘offload’ and addressing the cost concerns. There are some complications and subtleties: for example, one option is that as the traffic from the femtocell to AT&T’s security gateway is encrypted in a tunnel, so only on the other side of that tunnel can data (or voice) traffic be intercepted. So it still is “AT&T” traffic and has some costs, even though it has avoided the SGSN and GGSN.

But on a Femto with 'true offload' the cost might be as low as $0.07c – and it is the difference between that and $2.39 which explains why AT&T feels it cannot yet afford to give data for free, and why people are so interested in SIPTO.

One thing is certain: there would need to be a clearer regulatory environment to allow this to happen.
I believe that carriers will offer Femto traffic unlimited (yes, it has a cost, but so does losing a customer).

But the regulatory system is obviously problematic. Consider the case where a suspected terrorist uses a phone to access some data on the internet – perhaps the recipe for a bomb. If they use one of the radios on their handset radio the information can be tapped, but if they use a different radio then they are immune. Same suspect, same phone, same information and quite possibly the same router but different legal status. (The situation gets even stupider if you think of LTE: 20MHz of OFDMA at 2.6GHz must be tapped, but 20MHz of ODMA at 2.4GHz need not be).

I’ve lived, long enough to know that they law need not be rationale, but as an engineer I still think that this is weird.

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