Mallinson: Handling the coverage and capacity crunch
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Exponential data growth calls for revolutionary carrier service strategies. Expanding 3G footprint and capacity is only part of the solution.

Until the last couple of years, 3G coverage and capacity was a non-issue for end users. One could call and text to one's heart's content on 2G that performed pretty well across Europe. Few people were using dongles. Expectations for browsing, streaming and downloading on phones were modest, with a lack of decent mobile Internet services and performance was limited as much by device deficiencies--in modems, operating systems, applications processors and software--as it was by unavailability of 3G network resources.

Of late, many more people are acquiring dongles, smartphones and usage has increased with improving devices, mobile internet services and end-to-end user experience. The multiplicative effect of increased adoption and increased usage per user explains the current exponential growth in demand.

The strain has thus become apparent due to both coverage and capacity limitations with 3G, although users cannot always distinguish between these two shortcomings. Congestion on 3G can result in performance akin to or even inferior to 2G. Canny mobile industry folk sometimes turn off their 3G transceivers at trade shows to improve smartphone performance...
by switching to less clogged 2G networks.

December apologies

_FierceWireless:Europe reported_ 3UK had confessed that some customers were experiencing poor web browsing and email performance and would be allowed to cancel their contracts or receive a discount. In an effort to restrict the number of customers affected, 3 said it temporarily suspended dongle sales in areas that were poorly served for 3G--without pinpointing which areas in the UK had coverage problems. According to Hugh Davies, 3’s director of corporate affairs, these suspensions were to take place across "a few hundred sites where, for a short period--one to three months--we'll be advising stores in those areas to have a thoroughly good check of the coverage maps to make sure [potential customers are] not on the edge of a degraded experience."

The head of O2 in the UK told the _Financial Times_ he was disappointed with O2's network performance in London since the summer. Ronan Dunne apologised to customers who could not make phone calls because the mobile operator's London network was overwhelmed by bandwidth-hungry smartphones. According to this newspaper, O2 ran into difficulties in the capital during the second half of 2009 as customers with smartphones such as Apple's iPhone ramped-up use of applications that repeatedly pull data off the internet at short intervals.

The head of AT&T's wireless unit said it was working to improve its network for iPhone and other smart-phone subscribers in New York and San Francisco. Ralph de la Vega, chief executive of AT&T Mobility, said at an investor conference that networks "are performing at levels below our standards." Verizon Wireless has exploited those difficulties in extensive fun-poking TV advertisements. These claim it has a superior network with five times the 3G coverage.

Data tsunami

Percentage growth rates have been very high, but were on a relatively low base until a year or two ago. With voice traffic continuing to exceed data on all mobile networks until 2008 at the earliest, overall growth seemed manageable in the context of total traffic. This is because the impact of data was still less than doubling total network traffic. Network planners could get by with some incremental thinking for a while. No longer.

Data is set to exceed voice traffic on more and more mobile operator networks. With an average of less than 300 minutes per month, European users account for approximately 20 MB of voice traffic per month. As reported by _FierceWireless:Europe in November 2009_, the global head of France Telecom's Orange mobile business, Olaf Swantee stated that already 24 per cent of its mobile customers were using 30Mb of data per month, compared with just 17 per cent of the customer base who were using 25 MB in February 2009, including pay-as-you-go and pay monthly contract customers. Figures exclude mobile broadband customers with dongles.
Nielsen estimates that the typical US iPhone customer consumes 400 MB of data a month. By comparison, the average smartphone subscriber consumes between 40 MB to 80 MB of data a month. Whereas average data usage rates vary by nation, iPhone and devices that succeed in emulating its success will generally stimulate network traffic growth in multiples within the next few years... Continued
FireceWireless:Europe reported in January that the build up to the Christmas holidays saw the iPhone account for nearly 80 per cent of the contract sales made by France Telecom (FT) Orange. This historic level, said CEO, Didier Lombard, could be a problem given its near-monopoly of sales made by the mobile operator. In fact, problems will be manifold with coverage and capacity demands from this device, as well as its challenge to disintermediate the mobile operator’s own enhanced services.

**Flood protection**

Increasing 3G coverage, to a degree, with HSPA, HSPA+ and LTE is worthwhile for mobile operators, although this will actually increase traffic throughout the network including in the radio access network elsewhere due to, so called, network effects.

Increasing raw bandwidth cannot be the only means to alleviating congestion. Demand is insatiable. Left to their own devices with cheap and unrestrained usage, some users in certain places—such as peer-to-peer file sharers sitting close to masts—will unacceptably impair performance for users with more modest data volume requirements who have greater need for service quality.

Networks need to become much more intelligent and flexible. However, there are both regulatory and technological impediments to this common sense approach.
Whereas America is softening on the proposed inflexible and economically dysfunctional strictures for network neutrality, Europe appears unmoved. The U.S. Federal Appeals Court has sharply questioned whether the Federal Communications Commission has jurisdiction to write, much less enforce, net-neutrality rules for the Internet. Google and Verizon Communications, past opponents in the Internet regulation debate, proposed compromise in a joint filing to the FCC recently. The companies said preserving an "open Internet" calls for "minimal interference from the government while acknowledging the role for appropriate oversight (and enforcement.)" Former European Union Competition Commissioner, Neelie Kroes, who is commissioner-designate for the Digital Agenda portfolio, is succumbing to political pressure from the MEPs. In response to formal questioning from MEPs in a January hearing, she replied that Internet providers "shouldn't be allowed to limit the access to service or content out of commercial motivation but only in cases of security issues and spamming."

On the contrary, commercial and technical freedom is required to attract necessary investments. The issue is particularly acute in mobile services. FierceWireless:Europe reported in November that Vodafone Europe CEO, Michel Combes, believes that additional revenues are needed to continue investment in the data networks, but without simply becoming high-speed dumb pipes that would continue to benefit the main winners in the mobile internet space, such as Google and other big search engines. According to Combes, ideas that could be considered to boost revenues include content providers paying operators to guarantee their content is carried over the network without disruption, and operators receiving a fee from micro-billing and providing location services. Vodafone is also offering its business customers the chance to pay a premium fee to guarantee a better service.

In addition to deploying faster radio, backhaul and core network technologies for additional capacity and coverage, mobile operators also need to rethink their associated IT systems strategies. Techniques such as traffic shaping with deep packet inspection are essential to temper peak bandwidth requirements and so that tiered services and pricing can be offered. Whereas network costs per bit must be reduced in line with data traffic growth per user, a diverse kitbag of business tools including policy management, subscriber data management, real-time charging, analytics, service delivery, data retention, assurance, fulfillment and media control are also required to reduce costs and boost ARPs. Business and IT transformation can rationalize disparate systems and reduce costs while increasing revenues through flexibility and integration of the above capabilities. This will help grow staple service revenues with differentiated offerings such as premium-priced business class services.

Service enrichment

These improved capabilities are also required for enhanced services that ride on top of the network, whether they are provided by third parties or the mobile operators themselves. For example, users like to access multiple services with a single sign-on, and access the same service through multiple devices and networks with just one user profile and service
subscription. This creates the need for unified databases for subscriber management and authentication. In addition, mobile operators need to be able to differentiate service offerings on the basis of parameters such as maximum latency for chatty and other delay sensitive applications versus large scale bulk data transfer for which latencies of seconds, minutes or longer might be acceptable.

Next generation networks are as much about creating and integrating intelligent business systems as they are about deploying higher throughput. Telecoms and IT is, at last, converging.

Keith Mallinson is a leading industry expert, analyst and consultant. Solving business problems in wireless and mobile communications, he founded consulting firm WiseHarbor in 2007.