

Offloading mobile broadband traffic

by Vikash Varma, President & CEO, Stoke, Inc.

To address the exploding demand for mobile broadband data, operators are investigating new marketing and technology solutions. Operators need to optimize traffic on their networks to meet both user needs and their business objectives; WiFi offload is seen as a large part of the solution. Nevertheless, unmanaged WiFi pushes user and operator over a precipice where quality control, measurement and information disappear. Done properly, managed WiFi offload is one of the most pragmatic, non-linear solutions to supporting mobile data users' expectations.



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The sheer scale of mobile broadband uptake is breathtaking: by the end of 2010, mobile broadband subscribers worldwide should number 450 million - a 45 per cent share of the global broadband market. By 2014, mobile broadband traffic will surpass 14 exabytes (trillion megabytes). Mobile broadband operators worldwide are searching for new solutions to address this demand.

Fundamentally, the industry is shifting its emphasis from building revenues by customer acquisition to a service-based revenue improvement model. Providing customers with value-added services is an ever more important factor in generating revenues, maintaining the user base and increasing ARPU.

User-operator disconnect

There are still disconnects between vendor strategies and operator requirements. The user's behaviour and expectations on the mobile broadband network have irrevocably changed. This dynamic brings opportunities

as well as issues in its wake. It is disconcerting to see heavy mobile data users - or devices - branded by some observers as unacceptable or even 'bad'. Mobile operators are being encouraged by a segment of the vendor community to turn back the clock with punitive pricing and undisguised strategies geared to curb usage. In reality, while there is no single solution for data overload, there are alternative technology strategies that can support both user demand for mobile data and the transition to new business models.

Identifying the problem

The two mobile broadband segments - dongle/embedded laptop (portable) and smartphone - are each problematic. Analysts indicate that portable usage is responsible for most mobile broadband usage, placing a heavy load on the operator's core network. Smartphones also place a signalling burden on the network that exceeds the load imposed by dongles and embedded laptops. So, with

overload occurring both on the control plane and on the data plane, the planning and investment implications for 3G networks will continue to be problematic.

Understanding the user

So how can carriers keep their businesses viable over the long haul? Customers are not going to change back to previous habits. Policies like usage-based pricing are only part of the fix and, for certain types of users, will resist. How does a mobile broadband operator administer usage-based pricing and maintain competitiveness when always-on is the order of the day? There are pragmatic and perception issues surrounding this solution. For example, most social users have difficulty understanding what a 'Gigabit' actually means and feel cheated by restrictions based on units of measurement to which they don't relate, especially when a phone can automatically download 25MB of data in a single text or email. Tomorrow's revenue streams must come from understanding the customer.

Options such as increasing bandwidth or direct tunnel are like creating an extra lane on a busy highway. They provide a temporary solution, but don't address all the underlying issues. Brute force will not address the many dimensions of mobile broadband data usage. Operators need a precise solution that provides the intelligence to selectively offload and direct certain types of traffic. Answers need to be considered as part of an overall solution rather than in isolation.

Most carriers are looking at a range of new technical methods to help deal with growing mobile data traffic, so legacy infrastructure vendors will need to adapt their responses to mobile broadband. Data growth is exponential; it is not addressable by linear solutions. Data management solutions must be surgical, in the sense that they can be applied with great precision to specific data traffic types. The solutions should include a variety of offload options, including femtocells to facilitate licensed-spectrum reuse, selective IP traffic breakout to offload data from the mobile core, and WiFi offload to bypass the mobile infrastructure completely.

Offloading: the new imperative

At a recent Wall Street Journal conference, FCC chief Julius Genachowski highlighted offload as one of the principal ways to ease congestion on 3G and future networks. Genachowski has frequently pointed to how well WiFi works in adding unlicensed spectrum to the broadband mix, making it possible to offload as much as 40 per cent of traffic from carriers' networks. But WiFi is not the only option.

There are three principal types of offload. Of these, Mobile Data Offload is the newest player - and fastest to market - in the solutions set, offering the ability to deliver precise control over specific types of traffic while selectively diverting traffic streams away from the data core infrastructure to the Internet. The 3GPP working group looking at local IP access and selective traffic offload (*LIPA/SIPTO*) incorporates this technique.

Femtocell offload, a 'converged' voice and data solution designed primarily to deliver improved coverage, is now a cornerstone of offload strategy. Nevertheless, when the number of devices attached to a femtocell increases significantly, the traffic on the backhaul network of the femtocell can increase sufficiently to cause backhaul network congestion and delays during communication. The other 'consideration' for femtocell is the cost of the CPE (*customer*

premise equipment); unless it delivers additional services, subscribers are not likely to pay directly for this build-out of the operator's network.

WiFi offload has moved rapidly to the forefront of offload discussions since it uses free spectrum; the technology is proven, and is widely available on mobile devices. Apple's iPhone 4, which only offers video calling via WiFi, sends a strong message to users, operators and developers that WiFi is the logical choice for bandwidth-heavy wireless applications. There are, however, several ways to incorporate WiFi access into a mobile operators' service mix, and choosing the right solution can have long-term implications.

The UMA/GAN and WLAN [UMA (*Unlicensed Mobile Access*) and GAN (*Generic Access Network*) offer fixed-mobile convergence between cellular and WLAN - (*Wireless Local Area Network*) technologies such as WiFi and Bluetooth] interworking products and standards have been available for many years and provide a vetted blueprint for incorporating unlicensed WiFi spectrum into an operator's service mix. However, they have never been widely accepted. Despite today's acknowledged data overload, vendors and users fear the complexity of integration with core network systems and mobile equipment. These challenges are solvable, but the motivation to deliver the solution is not yet there.

An alternative to the 3GPP-standard WiFi solutions is simply to allow the mobile equipment to connect to any WiFi network and access content over the fixed line network. Since most WiFi users, which includes most mobile data users, primarily consume content from the Internet, this 'unmanaged WiFi' is the simplest to deploy and manage for the mobile operator. Problem solved? Maybe.

Managed WiFi offload

Unmanaged WiFi offload presents a particular challenge to both content providers and operators. Since WiFi connections are not recognized by mobile networks, it is difficult to track usage and then sell new services to users connected via WiFi. This can significantly affect mobile content and other revenues. To operators, an 'untethered' customer is basically lost; the unmanaged/unmonitored offload does not let operators monetizing sessions or even to retain customer relationships. Unmanaged offload solutions offer operators little long-term value since they have no opportunity to market

new services to users. Moreover, unmanaged, cost-free, WiFi will often provide subscribers with a better Internet experience than the 3G network, so subscribers will increasingly tend to seek WiFi. Mobile users' preference for free, high quality, WiFi will force 3G prices down and reduce the time users connect via 3G and consume paid-for mobile services. Managed WiFi offload gives operators a better way to embrace WiFi access.

To develop additional revenue via advertising, content or network services, operators need - at the very least - to know what their customers are doing even when offloaded to a WiFi network. Carriers need to maintain visibility and control over WiFi connected subscribers to avoid the pitfalls of unmanaged WiFi; they must also do so while minimizing mobile equipment modification and core network integration. The difference between managed and unmanaged WiFi offload is the utilisation of an intelligent, session-aware gateway through which the subscriber's WiFi session traverses on its way to the Internet. Regardless of the wireless technology used, this gateway reports the subscriber's usage to the mobile operator network for gathering market intelligence and to support usage quota tracking. The managed WiFi offload gateway also provides some session control, which will be important for mobile advertising and QoS applications.

In attempting to address the explosion of demand for mobile broadband data, operators are investigating new marketing and technology solutions. It's an exciting moment in the history of communications, with the potential to bring operator and customer into a close and mutually beneficial relationship. Operators need to optimize traffic on the network to meet both user needs and their objectives, and WiFi offload is rightly perceived as a large part of the solution. There are caveats, however. Unmanaged WiFi pushes user and operator over a precipice where quality control, measurement and information disappear. Done properly, WiFi offload comes into its own as one of the most pragmatic, non-linear solutions to supporting mobile data users' expectations. ●

