

What's an Operator to Do? Solving the Bandwidth Crunch

By Chris Hoover

Mobile operators have been anticipating (and investing in, and standardizing upon) mobile data services for more than a decade. A huge hype cycle at the end of the 90's about the "Internet in your pocket," (and associated ARPU) ultimately fell flat. Devices available at that time offered a tiny text-based interface and staggeringly slow connectivity to precious little meaningful content. Operators had made massive infrastructure investments supporting mobile data services that nobody used. What was widely touted as a revolution on par with the Internet itself would have to wait.

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To encourage subscribers to fill their empty bandwidth, operators offered inexpensive, all you can eat, flat rate pricing. Over time, infrastructure evolved to support improved data rates and hope remained that someday, data usage and associated revenue would increase. But the devices themselves remained closed to developers with an interface optimized for voice (or, as with the BlackBerry, for specific services such as e-mail). The general Internet experience was still, on the whole, suboptimal.

Then, with the introduction of smartphones, everything changed. The operators selling these sophisticated devices saw subscriber data usage soar almost overnight. This, combined with the gradual

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decline of traditional voice services, is finally fulfilling decade-old expectations. But the mass adoption of mobile data is creating challenges and opportunities for operators in almost equal measure.

With appropriate pricing models, data revenue could more than compensate for the decline of voice. But the legacy of flat-rate pricing meant that even dramatically increased usage had little direct effect on revenue. The graphic representing this, with a volume curve dramatically rising above a flat revenue line, has become de rigeur for any industry presentation as vendors tout solutions.

Additionally, the smartphone's open application platform and usable browser resulted in subscribers immediately abandoning the operator's "walled garden." In the span of a single year (2007-2008), operator's internal offerings moved from the number one position in the top ten mobile sites to dead last. This trend shifted subscribers' view of operators as a utility service and resulted in revenue coming under even greater pressure.

With the combined challenges of addressing data demand and generating revenue, operators need to strongly move forward on several fronts. While several specific strategies are being debated by the

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industry as a whole, most solutions fall under one of a few categories. Operators can:

- Build out infrastructures to support increased network traffic, including implementing next generation technologies such as LTE which has a much lower price per bit vs. 3G networks (up to 90% lower, in fact);
- Offload traffic on to another network;
- Implement network policies to enforce limits and prioritize traffic; including:
- Reduce the impact of traffic through clever compression and/or caching techniques;
- Adopt new retail models such as iPad-style service passes; or,
- Adopt new wholesale models such as Kindle-style “comes with data” devices;



Each of these options has drawbacks and benefits, and most operators are investigating several of these options.

Infrastructure Build Out

Building infrastructure is costly and takes significant planning and time. With decreasing revenue, operators cannot sustainably throw bandwidth in the face of what appears to be insatiable demand. LTE adoption, though promising in the long term, is likely to proceed at a slow pace, and stands to cause various technical issues, such as roaming challenges, as various operators introduce the service within different spectrum.

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Offloading Traffic to Other Networks

Offloading will ultimately be a strong solution, but in the short term introduces myriad challenges. Subscribers will not likely remain sanguine as billing systems that cannot distinguish between offloaded and on-network usage charge the same for both. A similar problem exists for fair usage schemes as offloaded data accrues against a subscriber’s monthly threshold. Perhaps most difficult is the technical challenges of offloading data in the first place, as devices are not yet designed to seamlessly move between networks.

Intelligent Network Policies

Next-generation policy management enables operators to intelligently control subscriber entitlement to network resources with real-time,

dynamic policies. These controls are based upon session- and subscriber-aware policy rules (e.g., network resources available, device type, location information, etc.). These policies are centrally managed in a convergent manner across multiple access networks. As networks become more complex, a centralized policy management framework can reduce the administrative overhead of managing hundreds of policies and improve control over the integrity of the policy catalogue.

There are several different uses and applications of policies that are designed to relieve network congestion. An example includes:

Dynamic Traffic Prioritization

Operators cannot simply enforce rigid or strict policies without regard for the nature of the subscriber or network conditions. “Blindly” capping or throttling users through global fair usage policies can compromise the experience of the most profitable subscribers on the network, increasing risk of losing them to churn. It is paramount that operators understand that resource constraints will occur in the network at certain times, and planners and architects must take proactive actions that consider the context of the subscriber’s activities, and the value of the customer before action is taken.

Service providers must understand the nature of congestion during periods of high use and prioritize traffic based on pre-set parameters, such as: subscriber profile (e.g., usage history; customer type—consumer, business, or government; preferences; SLAs); account plan (e.g., tiered service plan, contract terms conditions, premium service options); and, application type (e.g., music downloads, streaming video, HTTP, VoIP and P2P, just to name a few).

New Retail and Wholesale Business Models

Strategies for addressing network congestion are only part of the challenges operators face; next generation revenue models are also required to replace legacy flat rate schemes. For example, an

operator partnership with third party providers allow for “split billing” scenarios, in which a subscriber receives some portion of a service (for example, high QoS for the first 10 minutes of a video, or access to an application) as a “free” offering subsidized by the content provider. Wholesale scenarios include “comes with data” scenarios such as that provided by Amazon’s popular Kindle device, which provides free data connectivity for accessing books. A similar “comes with data” scheme can be built into applications, such that the application price includes any associated data charges.

As increasingly sophisticated devices continue to flood the market, the unprecedented amount of data generated provides operators with unprecedented opportunity for new revenue streams. But the associated challenges are significant. Operators that don’t understand the tradeoffs associated with various options – or who are unwilling to overcome the inertia of legacy business models, will likely suffer increasing pressure on their top line as revenues continue to flatten, as well as on their bottom line as they scramble to shore up capacity. By implementing network evolution and offloading strategies along with sophisticated policies and multi-faceted revenue models, operators stand to benefit.