

Find hidden power in networks

by Yves Hupé, President & CTO, Memotec Inc.

Availability of network capacity is a critical consideration for telecom service providers. New services drive the need for bandwidth at an ever-increasing rate. Providers with insufficient bandwidth risk customer dissatisfaction and churn. To meet growing demand, network planners need to balance the heavy cost of networks upgrades against the short-term advantages of lower cost 'quick fix' tactical solutions. New network optimisation techniques, including bandwidth compression, statistical multiplexing and packet-level service aggregation, among others, can provide robust solutions to network capacity problems.



Yves Hupé the President & CTO of Memotec is a seasoned telecommunications industry executive with over 17 years of experience in the service provider sector. Mr Hupé served previously as the VP of Marketing and Product Management at Memotec. In the past, Mr Hupé held a number of executive positions in Tier-1 companies (Alcatel-Lucent group) and start-ups.

Yves Hupé holds an MSc in Physics and Electronics from the Ecole Supérieure d'Electricité (ESE) Paris, France, with a Major in Computer Science and Robotics.

"So just how much capacity do we have in the network?"

If there is one pressing question on the minds of senior executives of mobile networks, this is it, and it is no wonder. Network capacity is a critical part of a successful business model in today's fast changing world of 3G, iPhones, Twitter and LTE. If you haven't got enough capacity, your customers will soon find out. At best it will generate a wave of complaints on your customer support lines; at worst customers will simply switch to an alternate service provider.

While marketing and sales teams aggressively push for the rollout of new services to increase revenue potential and attract new customers, network planners are ultimately faced, sometimes too late, with filtering through the diversity and complexity of options to provide the necessary capacity for these new services. The usual path, albeit the most costly, is to purchase new network resources (T1/E1, microwave, fibre, etc) or upgrade the existing transmission plant to newer technologies (Ethernet, Optical). Alternatively, there is the option of deploying optimization solutions at main pressure points in the network. Still, business managers and CFOs understand

that the former path results in higher network costs, both operating and capital; it hits the business model and cash availability hard. Network planners understand the latter path is a tactical solution that does not support long-term network planning strategies.

The art of network optimization

All good network planners work with a few key objectives in mind: controlling network capital expenditures - so that good money doesn't chase after bad business models, and protecting existing and long-term network investments. Given the limited availability

“Although OBC can successfully transform network performance without costly capacity deployments, it is important to understand that not all OBC solutions are alike.”

(time and location) and high cost of additional capacity, as well as the regulatory restraints on spectrum allocations, network planners struggle to find the right solution. Blindly deploying cell site aggregation gateways is not necessarily going to solve immediate bandwidth problems and network planners know this. That is where OBC (*On Board Computing*) network optimisation tools come in.

There is a certain art to network optimization. Instead of seeing the network as a set of bottlenecks that need tactical deployments of either optimization or capacity increases, we see the network as a whole, a combination of network infrastructure and their services existing together in a smoothly functioning totality. That is because each service needs to be addressed in the context of the entire network. For instance, a 3G strategy needs to consider future as well as immediate requirements in terms of traffic growth and service migration, resulting in the necessity of sharing bandwidth with other existing services. If not, then traffic management cannot be properly sustained and the return on investment (*ROI*) will fail to support the business model.

There is a difference between a carrier-grade network and a customer-grade network. We need to look at the networks differently; not as something consisting of individual components connected according to carrier-grade practices, but as a totality where customer services - not network philosophy - are the driving element in the growth of the network.

Good network analysis is what drives a successful deployment of OBC solutions. Once the goals of the business operation are defined (a 3G rollout for instance), then it is time to look at the actual link capacity per application. All applications are examined in the context of existing assets during peak periods when links are most at risk and quality of service (*QoS*) issues can be evaluated in detail.

The results of such an analysis will clearly reveal if, when and where an OBC solution can be cost effectively deployed in a sustainable fashion.

This is particularly relevant today with the rollout of 3G and HSDPA services, which are well known to cause sudden overloads of data traffic on other parts of the network. This has a direct impact on the existing services such as 3G voice: voice quality drops, cut off voice conversations, delays, etc. Combining cell site service/traffic aggregation and OBC will solve the problem short term and increase the performance of the network longer term. This is an example of why it is important to consider all services when deploying OBC solutions. If not, then operators run the risk of reducing customer satisfaction and increasing customer churn.

Deploy new services without tears

One operator with international voice and data lines faced severe congestion and QoS issues. Voice was clipping, and at peak hours calls were being dropped. Customer service was flooded with customer complaints. An analysis of all the network applications and service determined that customer satisfaction of voice services was strategically the operator's top priority. Customer-grade is now the way to go. An OBC-based solution was deployed with outstanding results: customer satisfaction went up 300 per cent and the operator was able to allocate extra capacity to support HSPA services.

OBC has three principle techniques: converting all traffic to a common packet layer providing the base line for service aggregation, statistical multiplexing and bandwidth payload reduction. These tools can solve not only straightforward congestion issues like the one described above, but also more complex network architecture and traffic management issues that can stand between an operator and the timely deployment of new services.

Another operator was under a great deal of competitive pressure to rollout 3G services to protect its market share. Time to market was crucial. The dilemma was that the network was already at, or near, full capacity supporting existing revenue-generating 2G services. Through tactical implementation of OBC-based solutions that enabled multiservice capabilities on the mobile backhaul infrastructure, capacity was liberated enabling the rapid deployment of the

3G services while empowering the operator to dynamically manage its bandwidth. As a result, the operator's go-to-market strategy went from being a potential market failure to a timely market success that gave them the competitive edge they needed. Moreover, the operator gained new insights into how to better manage traffic so that QoS was even better than before the 3G deployment - on the same network infrastructure!

Not all OBC solutions are alike

Although OBC can successfully transform network performance without costly capacity deployments, it is important to understand that not all OBC solutions are alike. Specifically, when considering an OBC solution it is critical that the solution fit the operator's requirement for technology convergence. Indeed, one of the reasons why network planners avoid so-called tactical solutions is that these solutions cannot be applied across the whole network. Here are some guidelines:

- flexibility - to support multiple applications on a single device, an OBC solution must have available the full range of interfaces common throughout the network;
- scalability - an OBC solution must be able to scale seamlessly from a single E1/T1 to multiple STM-1 connections (this avoids costly forklike capacity upgrades); and
- multi-service - an OBC solution must be able to allocate bandwidth between diverse services.

Any OBC solution can easily double, triple or even quadruple the bandwidth capacity of existing networks. However, what good is an OBC solution if it alleviates only a single type of bottleneck? Instead, to meet an operator's strategic network requirements an OBC must address the issue of capacity across the whole network, across multiple services and platforms, in a dynamic and efficient manner. That is a 'customer grade' network.

The right OBC solution is not a short-term, one-hit wonder; it is a powerful tool to manage network capacity in a strategic fashion, allowing an operator to unlock the tremendous potential for service growth hidden in the current network. ●