

Video drives traffic growth, but reduction in ROCE

Jon Haley, vice president of business development at Edgware, sets out the business case for distributed video delivery networks

By now, everyone is very well aware of the massive growth in video traffic across the Internet. This traffic growth, by most available forecasts, shows little or no slowdown in the foreseeable future and has become both an exciting as well as worrying trend for all of those organisations involved in carrying this traffic from content provider to consumer.

The unprecedented rise in dense, high bandwidth traffic streams that typifies video has an unintended effect on the financial strength and viability of the operator organisations.

Various analyst organisations have pointed out that the rise in traffic, driven primarily by the growth of video, builds downward pressure on the return on capital employed (ROCE) characteristics of the operator organisations. This in turn inhibits, rather than drives investment, which then becomes a matter of concern not only to the shareholders of the operator organisations, but also of the regulatory and economic development arms of government.

To demonstrate this more clearly, an example of a UK local loop unbundler (LLU) organisation can be used to show both the costs and a possible solution to the issue of video traffic growth.

First, it is important to understand the network topology in place and the cost structure associated with the various elements of the network. Information used is publicly available (see ref: *Delivering high quality video*

services online, Analysys Mason, 10 November 2008, Ref: 12122-462)

With the growth of traffic the points of the network under the most pressure becomes the backhaul element. This is a highly expensive element as it is frequently not under the direct control of the LLU itself and has a relatively linear cost structure. If the mathematics is assumed to be correct, it becomes very clear that without a topology change or more advanced method of managing video traffic; backhaul costs alone accelerate well beyond the additional revenue provided by subscriber growth over the ten-year analysed period.

In order to be able to handle this growth in video traffic, the network diagram in Figure 2 illustrates the required growth in transit and peering traffic, core network equipment upgrades and upgrades to the backhaul service. The cost of these upgrades can be estimated and are shown in Figure 3.

At this point, it becomes interesting to look at alternative approaches to managing traffic.

While an immediate reaction might be to look at management of the backhaul costs, there are two elements that should be analysed to create a more compelling and broader based business case:

Managing the backhaul traffic by minimizing the traffic traversing that element of the network

Understanding the additional revenue sources that may be available from content providers interested in delivering the best possible quality of experience (QoE) to the viewers of their content.

Neither of these approaches alone provides a full view, as effective video delivery in such a network requires a holistic approach to distributed video delivery. In effect, the operator

becomes a content delivery network (CDN) provider, enabling not only a chargeable service to the subscriber, but also to the content providers who wish to provide their content to the subscribers to which the operator is providing service.

Core Node vs Edge Node Caching

In the topology shown in Figure 2, there are many possible locations to enable caching to reduce the direct traffic load across the network.

Because of their central location and low numbers, it is possible to alleviate some of the traffic load by additional investment in core nodes. This tends to be the most popular approach by infrastructure specialists, as well as network infrastructure vendors who specialise in providing massive capacity in very large and costly Internet class routing and switching nodes. However, as the consumers of this traffic are connecting through the access network, and as shown in Figure 3, backhaul as provided by BT's Backhaul Extension Service (BES) is a very major

UK LLU Ave BES Costs	Cost (£)
Yearly cost per BES (5.6km line)	
100Mbps	8000
1Gbps	18000
10Gbps	28000

cost element, the most desirable caching location lies further towards the edge of the network, preferably at the remote end of the backhaul connection in a PoP or exchange location.

Elements of a Distributed Video Delivery Network (DVDN)

The challenge with edge node caching is that it requires a different type of device from the typical data centre cache server. It requires a device that is "more network appliance than server". This type of device was described in detail in the last issue of IPTV International, which can also be read at www.edgware.tv/news. A COTS (commercial off the shelf) server cannot be deployed in this environment due to constraints on power, reliability, heat dissipation and storage. By deploying specialised server appliances, which have been designed to be deployed in this environment, it is possible to gain the cost savings to drive an attractive business case.

The added advantage of deploying this type of system is that it also includes:

- Sophisticated asset propagation and distribution management system
- Advanced statistics collection
- Optimised request management, logging and redirection
- IP and Geo location identification and enforcement
- Optimised stream prioritisation capabilities
- Integration with a security or conditional access system

Again, assuming that the mathematics can be

Figure 1: UK Broadband Video Traffic Growth Forecast

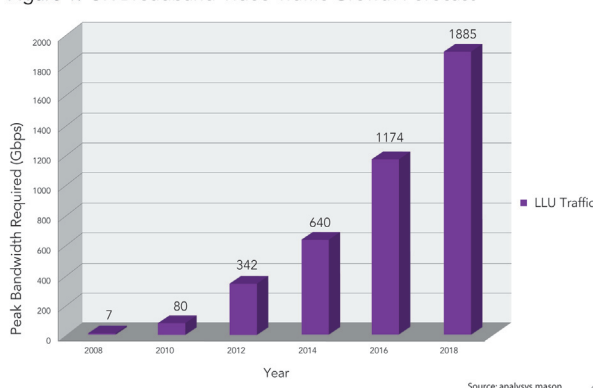
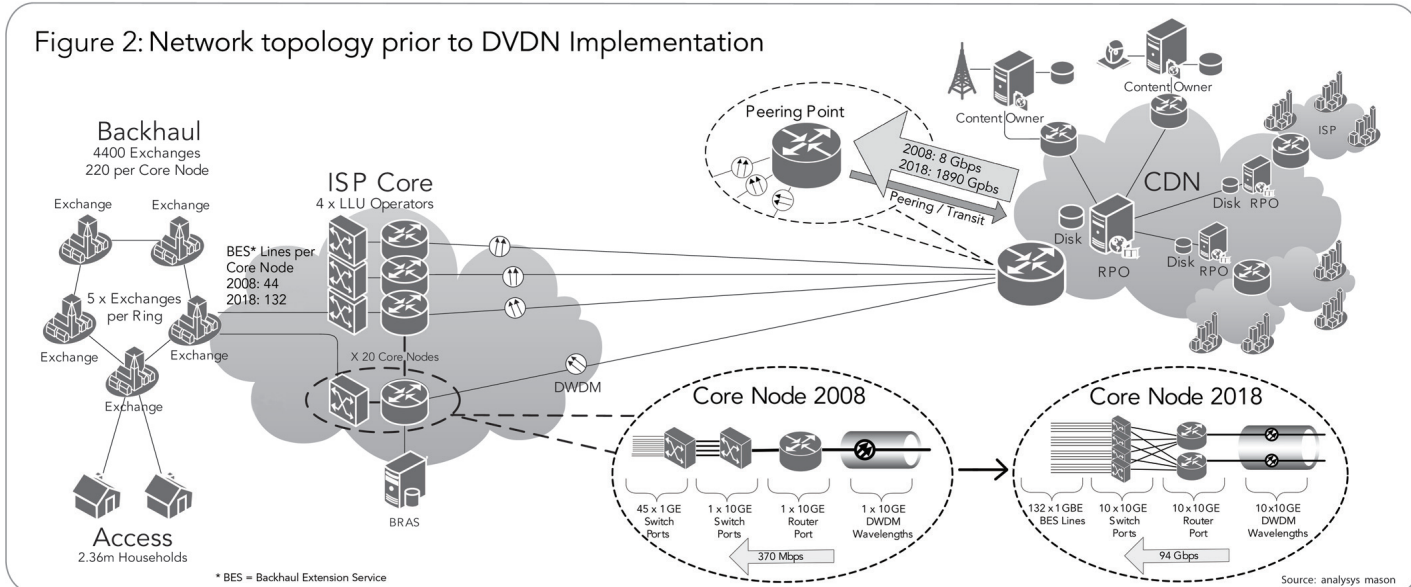


Figure 2: Network topology prior to DVDN Implementation



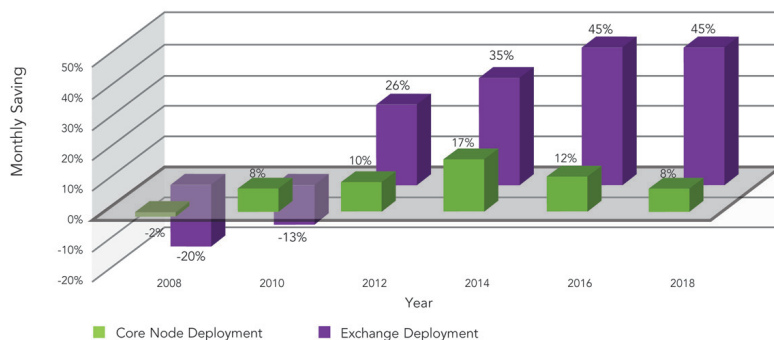
taken for granted, the business case for an edge node deployment can be shown below. At this point, a Distributed Video Delivery Network becomes a highly profitable addition to the provider's delivery portfolio.

Video Delivery Network Generating Additional Revenue

In addition, once such a Distributed Video Delivery Network is in place, is deployed and actively delivering content, it becomes possible to show the content provider the benefits of participating in a premium service offering. This is a differentiated class of access to ensure the optimum QoE for the subscriber.

Advanced theory of operations of a CDN is outside the scope of this article but a recent analysis of the business case for a video delivery network for a leading Central European provider

Figure 4: UK Broadband LLU Cost Savings from Edgeware DVDN



showed a highly attractive ROI when this additional revenue aspect was taken into consideration.

Summary

The rise of video traffic can be seen as both a challenge and a huge opportunity for operators across the spectrum. However, to take advantage of this phenomenon means that a focus on delivering a differentiated Quality of Experience can provide the operator with both satisfied subscribers and additional revenue opportunities from the very content providers that have been flooding their network with ever-higher quality "Over the Top" video offerings.

However, successful delivery requires more than just buying more bandwidth. The growth forecast is so rapid that conventional bandwidth expansion approaches become unprofitable very quickly. A Distributed Video Delivery Network featuring request and stream management, as well as CDN management and analytics capabilities might be the difference between being a victim of and profiting from this trend driven by subscribers demanding video and TV everywhere and at any time.

References:

<http://stakeholders.ofcom.org.uk/market-data-research/technology-research/research/emerging-tech/hq>

For More Information

Because of the relatively complex nature of the calculations, pricing and cost structure it is outside the scope of this article to show all of the elements of the business case. If you are interested in applying this business case to your own environment, please contact Edgeware by visiting www.edgeware.tv or by emailing sales@edgeware.tv.

About the author

Jon Haley, vice president of business development at Edgeware, in conjunction with a wide variety of operator contacts, developed, refined and tested this approach with many operators across Europe. Jon can be contacted at jon.haley@edgeware.tv



Figure 3: UK Broadband LLU Cost Growth

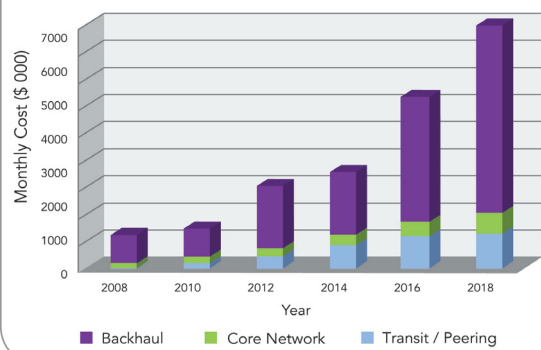


Figure 5: Operator DVDN ROI

