



The Role of Satellite in Relieving Network Congestion

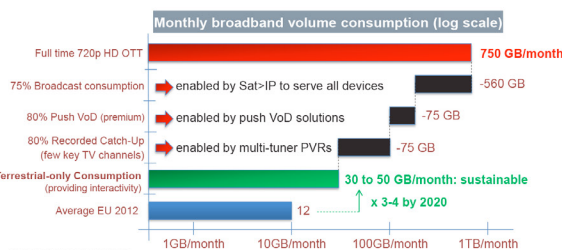


Video content distribution via the Internet inevitably and increasingly leads to network congestion, directly impacting the user experience. Congestion concerns broadband networks and infrastructure as well as Connected TV, as users demand that all services, including video, are available on multiple devices (televisions, computers, tablets & smart phones). **Satellites are directly relevant, as they (a) relieve congestion on terrestrial networks and (b) enable high-quality content to be viewed in the home and, thanks to new standards, on all devices.** As such, they are directly relevant to the development of high capacity broadband networks and services.

The Internet is becoming an important platform for video & audio distribution and consumption, giving rise to questions of capacity and congestion, as networks cannot support the projected traffic volume without bottlenecks in distribution, unacceptable delay or prohibitive cost structures. Satellite distribution will continue to be the most cost and spectrum efficient method of broadcasting or multicasting video and data content to a large number of users, at a cost per bit delivered that is independent from the number of users or the countries served. **Satellite solutions reduce end-to-end cost by reducing the capacity requirements for transmission through the Internet backbone, and improve quality by reducing buffering times and packet loss.** This works for both live and video on demand (VOD) applications, ensuring delivery with a guaranteed high quality of service. In fact, irrespective of the amount of fibre deployed in the Internet backbone, satellites will remain an essential distribution platform from a cost, quality & reliability perspective.

Congestion is often not only in the last mile, but just as likely to be in the middle mile or at ISP peering points. Satellite services will be critical to addressing this issue. The Digital Agenda for Europe (DAE) calls for a massive rollout of Next Generation terrestrial Networks (NGN), as if it were a total solution for enabling ultra-fast broadband directly to users.

Satellite makes NGN & Connected TV “sustainable”



Except for some urban fiber network operators, a 100% OTT consumption model is unsustainable, calling for hybrid solutions:

This graph shows an estimation of the volume of data which would have to be delivered in each household, should the end-consumers watch Ultra-HD on web-based Over-The-Top TV (OTT) channels. Such a volume, of above 700 Gb per month, is two orders of magnitude larger than the today's European average of 12 Gb per month. The only practical way to get Ultra-HD delivered and enjoyed by the end-user is to push the content by satellite whenever possible & then offload the web-based distribution.

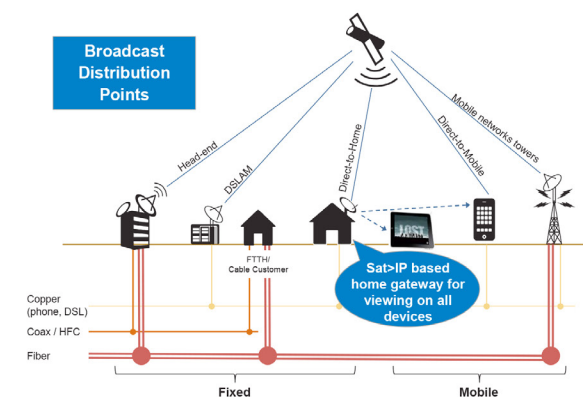
As it stands, the DAE ignores the key blocking issue that the volume of high quality video is going to cause to those networks, and ignores the crucial role of satellite in avoiding the potential congestion. The Connected TV initiative presents the opportunity for the EU Commission to redress the issue, as it should ensure the appropriate framework is in place **'to make sure users can access a maximum of high quality content on a maximum number of devices at the same time no matter where they are.'**

The viewing of high quality video content on mobile devices & in new locations will heighten the need to relieve network congestion in the Internet backbone. Households that receive a direct satellite TV feed used to deliver content via Wi-Fi onto multiple devices will not face this problem. Consumers increasingly expect to be able to have virtually all the content that they receive at home, either on their televisions or their computers, available to them on their mobile devices. Video content consumption in the mobility context will increase the spectrum requirements for the last-mile between the cell tower & mobile device. The issue of bringing that content to tens of thousands of cell towers itself also needs to be resolved. This challenge is identical to that of the fixed line situation & the need to relieve and avoid network congestion.

Mobile devices are not always used “on the move”, rather very often they are used in fixed settings, such as in the home or office. Satellites already deliver massive amounts of high quality video content into millions of homes worldwide. DVB signals, widely used at global level as the common standard for digital video broadcasting, can be converted to convey content in IP format into households, or other hotspots, for re-transmission using Wi-Fi technologies to multiple fixed & ‘mobile’ devices in the home. This can be done with a guaranteed quality. Millions of homes directly receive satellite feeds today providing efficient delivery of video content, which can be provided also for viewing on mobile devices. **The implementation of satellite delivery compatible with IP format could reduce the terrestrial & mobile networks’ load while guaranteeing the best possible quality over 100% of the territory and assuring that broadband delivery targets are met.**

Viewing video content on mobile devices does not mean mobile operators require unlimited amounts of frequency spectrum, as very often those devices will be used in “fixed” settings where 3G/ LTE is not necessary due to the availability of both Wi-Fi and satellite off-load. As said above, satellite can also enable reception of high-quality content onto mobile devices within the home using Wi-Fi without making use of 3G/ LTE spectrum at all, thereby offloading bandwidth-hungry traffic from mobile networks. In many parts of the world, the video content at the heart of the last-mile terrestrial wireless problem actually requires satellite spectrum to be available to bring that content to the edge so that users may enjoy it at the low cost & high quality they expect.

Future hybrid setups: satellite role in media broadcast injunction points for optimized network efficiency



The assumption that most video content will be consumed on mobile devices therefore distorts the perception of spectrum needs by mobile operators. This suggests the spectrum demands of mobile players are often overestimated. The growth in mobile Internet use is therefore not merely about 3G & LTE wireless networks & spectrum. It must also include the notion of offloading from those networks. **Wi-Fi & satellite spectrum, which can often be in significantly higher and less congested frequency bands, can be used to reduce the spectrum requirements currently allocated to 3G & LTE services.** Alone, 3G & LTE spectrum would not be enough to sustain the high volume of data imposed on mobile networks by new users’ requirements and video applications.

Additionally, mobile operators have already identified the business case problem of continuing to expand 3G & LTE networks indefinitely. Wireless operators around the world are ending “all-you-can-eat” wireless plans & imposing data caps on customers. Carriers, governments & businesses are already making Wi-Fi networks available to consumers at an ever-increasing rate. Video consumption is a significant driver of these trends. While consumers may watch television on a Tablet, a PC, or a smart-phone, they may not be willing to pay more for this kind of service even though these services push mobile networks to their limits. **Cost & spectrum efficiency demand that the solution be hybrid, where satellites deliver (or “forward-cache”) high-quality content closer to the end users for delivery to mobile devices via 3G, LTE, or Wi-Fi, so avoiding such bottlenecks.**

Satellites are ideal for cost-effective, high-quality point-to-multipoint, broadcast type applications, central to forward caching video content. While the Connected TV debate can only consider a standard viewing or at best high-definition scenario, industry is already responding to the high-capacity demands of the “new” video marketplace, where ultra-high-definition and even more advanced signal formats are an increasing reality. The laws of physics assure satellite as the prime means of video content distribution, whether in direct mode or in backhaul to relieve congestion on terrestrial networks, so growth in this field globally using key satellite spectrum bands is inevitable.

