

The online video traffic and applications revolution

by Stephen Ho, CEO of CPCNet

The Internet transports enormous amount of video traffic. In the Asia-Pacific region, nearly 4 out of 5 Web users view online video each month. In China, 199 million unique viewers viewed 10.3 billion videos in January 2010. High definition Video-Conferencing (*HDVC*) is especially interesting to companies with operations throughout the world; it lets geographically dispersed team members collaborate effectively, reducing the need for costly business travel. Given its volume, video traffic has increasingly important implications for network design and management.



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While many aspects of the Internet have undergone significant transformation over the past decade, perhaps the most visibly distinct change is the enormous amount of video traffic it now transports around the world. Because it has happened relatively gradually, this megashift might be easily overlooked or dismissed. All over the world, and in particular Asia Pacific, Internet video is now a truly mainstream medium, not merely an adjunct to other, more static forms of communication such as text or images. In fact, comScore indicates that:

Online video viewing has become an essential part of the digital consumer experience in the Asia-Pacific region, with nearly 4 out of 5 Web users viewing online video each month. Singapore (87.6 per cent) and Hong Kong (87.4 per cent) boasted the highest penetration of video viewers among their respective Internet populations. Both markets also exhibited high engagement with viewers averaging more than 10 hours of online video during the month. China had the largest video-

viewing audience with 199 million unique viewers, who viewed a total of 10.3 billion videos in January 2010.¹

Nielsen performed its own research on the topic, surveying more than 27,000 online consumers in 55 countries, and came to a similar conclusion: Asia Pacific is ahead of both North America and Europe when it comes to online and mobile video consumption².

This revolution in Asia-Pacific video traffic has extremely important implications for network design and management.

An explosion of technologies

Internet video must be considered in function of all the interrelated factors that contribute to today's media landscape. We must also consider the many new ways that video is created, distributed and consumed today.

In some sense, today's Internet video explosion can be attributed to a few primary drivers:

increased computing power; cheaper storage; easier tools; more pervasive access; and new business models.

Increased computing power - Improved processor chip architecture gave us tremendous increases in the computing capability of Central Processing Units (*CPUs*) and Graphics Processing Units (*GPUs*) that have given rise to a whole new set of advanced video creation and editing tools, providing end-users powerful new ways to produce high-quality video media. Virtually every modern smartphone and laptop computer has built-in video cameras, so a large number of people can create video content anytime, anywhere. Since the new chips and embedded cameras are of a high-quality, the resulting high-definition video files are often quite large.

Cheaper storage - In recent years, there has been a great gain in storage economics. Hard disk, flash memory, and RAM chip technologies have made such progress that it is cheaper than ever to store data. Users are no longer limited by

¹ comScore, *comScore Announces Introduction of Online Video Measurement Service in Australia, China, Hong Kong, Japan, Malaysia and Singapore*, 1 April 2010.

² Nielsen, *How People Watch — A Global Nielsen Consumer Report*, 4 August 2010.

the storage on their devices. They can capture, upload, and very affordably download huge quantities of digital video. So there is little incentive to be frugal when it comes to video, further contributing to the overall increase in this media type.

Easier tools - New software also encourages popular use of Internet video. The latest generation of digital camcorders and computer systems make it simple to capture and upload video onto Facebook or YouTube. Then too, many applications are now video-enabled; for example, Skype and MSN Messenger now include basic Video-Conferencing features. Digital video is no longer just for industry specialists; millions of people now use digital video daily at play or work.

More pervasive access - The fourth factor of the new video landscape is pervasive access. Recently, we have seen exciting growth in the diversity of Internet access, including widespread mobile access. This has given rise to new uses for video, such as the FaceTime feature of Apple's iPhone 4, which takes Video-Conferencing on the road. Smartphones and tablets now receive streamed movies and short clips at airports, hotels and coffee shops via Wi-Fi or cellular data.

New business models - High definition Video-Conferencing (HDVC) offers service providers a new business model. Although basic Video-Conferencing applications such as Skype and MSN Messenger, and mobile Video-Conferencing tools such as FaceTime on the iPhone 4, have given users a new way to communicate, their low resolution is often inadequate for business meetings. Now, service providers are offering HDVC as a valued-added service. Optimized for each service provider's infrastructure, HDVC applications offer a practical alternative to costly business travel, by helping international team members collaborate effectively. Because of its higher resolution, HDVC is frequently sufficient for meetings and training, helping companies save the considerable costs of air tickets, hotel accommodations, and venue bookings. In a report published mid-2010, Frost & Sullivan expects the Asia Pacific Video-Conferencing endpoints market to grow strongly, at compound annual growth rates of 13.6 per cent for revenues, and 16.3 per cent for units, till 2016³.

In today's cost-sensitive economy (and in crisis scenarios such as pandemics where travel is not an option) HDVC is a welcome breakthrough, thanks to improved network performance and chips that transport HD video and voice in real-time. Furthermore, HDVC generates

new revenues that help service providers differentiate themselves and improve their average revenue per user (ARPU).

Crossroads

In the new Internet video landscape - with its high volume of digital video creation and its greater variety of powerful tools, end-user devices, ubiquitous connectivity and consumption models - many factors work together in a synergistic manner, to boost video creation and consumption. As a result the Internet is being flooded with video, every second and every day.

As a result, we are at a point where - unlike the days of dial-up Internet - digital media no longer needs to work around the limitations of the underlying Internet infrastructure. Now, the network itself needs to change, to cater to the demands that users place on Internet video applications. Today, Internet growth and design are driven by video usage, not the other way around.

In a 2010 Cable and Satellite Broadcasting Association of Asia (CASBAA) survey, a hundred chief broadcasting industry executives indicated that: "High-definition TV (HDTV) and Internet Protocol TV (IPTV) services are expected to experience the most growth in the next 12 months, stimulated by mobile entertainment and online video."⁴

New challenges, new solutions

New network usage demands are facing Internet solution providers with a new set of challenge. First, there is the problem of efficient bandwidth utilization. Although bandwidth now costs less, the great increase in video traffic and in numbers of users and distribution channels, is forcing costs up and compromising efficient bandwidth usage, the quality of service, signal latency and responsiveness. But the solution is not as simple as merely prioritizing video content over other IP traffic. Video traffic shares bandwidth with other network packets, and video is not the only latency sensitive application. Real-time transactional processing for financial organizations is an example of another type of priority traffic.

Security is also a concern. Securing video against unauthorized usage or re-distribution is a pressing concern - especially for sensitive business video meant for internal distribution or copyright protected content meant only for authorized subscribers. Still, proper traffic security means protecting all IP traffic, not merely video content.

In addition, service providers face declining ARPU as basic bandwidth becomes a mere commodity. This leaves many service providers without sufficient revenue to invest in their networks to handle new services, so they must constantly seek to develop new revenue-generating offerings.

Fortunately, network solution providers have already come up with ways to tackle these concerns: WAN optimization, Virtual Private Networking, Web Cloud security and HD Video-Conferencing.

WAN optimization takes into consideration the complete, end-to-end, topology. Going beyond the intelligence of switches and routers, WAN optimization solutions analyze every network application crossing the infrastructure and maximize the efficiency of resource utilization. Time and latency sensitive traffic are given special treatment to guarantee the quality of service. Data that does not need to be re-transmitted, or is commonly accessed, is cached for rapid retrieval, to minimize bandwidth wastage. In a nutshell, WAN optimizers compensate for the Internet's lack of video-specific intelligence and enhances support for open standards for better connectivity.

Virtual Private Networks (VPNs) and Web Cloud Security solutions tackle vulnerabilities. Where video traffic must be secured against interception or interference, VPNs provide encrypted links essential for business Video-Conferencing and protects subscription-based services against piracy. Web Cloud Security solutions handle what VPNs cannot: spyware and other malware that disrupts network traffic, or hijacks sensitive data. The bonus for both VPNs and Web Cloud Security solutions is that the entire infrastructure is secured, not just the video traffic.

As for the ARPU issue, HD Video-Conferencing is attracting enterprise customers. As a new business model, HDVC encourages customers to increase their bandwidth to boost their organizational productivity and cost-effectiveness.

Great change today and tomorrow

We are seeing great changes in the Internet. Each month brings new developments in Internet and video technology. Fortunately, network solution providers are making great progress finding answers to today's challenges, and developing ways to tackle the problem that coming generations of digital content will bring.

³ Frost & Sullivan, *Asia Pacific Video-Conferencing Endpoints Markets CY2009*, 22 June 2010

⁴ Suite101. <http://www.suite101.com/content/asia-pacific-pay-tv-industry-says-business-booming-a302200#ixzz18nMpTMWV> (accessed December 21, 2010)