



sandvine[®]

Intelligent Broadband Networks

Global Internet Phenomena Report

Spring 2011



Executive Summary

This report, the ninth in an ongoing series of comprehensive traffic analysis studies first issued in 2002, identifies and confirms a number of important trends. The *Global Internet Phenomena Report: Spring 2011* is based on March 2011 Internet traffic statistics voluntarily submitted by a representative cross-section of Sandvine's customer base, which includes more than 220 Internet providers serving hundreds of millions of subscribers in more than 85 countries.

First, the findings confirm that Real-Time Entertainment traffic is continuing its journey to network dominance, particularly in North America, where it represents 49.2% of peak period fixed access traffic. If this rate of growth is sustained, Real-Time Entertainment will make up 55-60% of traffic by the end of the year. Additionally, as content rights holders gain trust in the medium, the Internet is increasingly being used to provide live coverage of major events, including The Royal Wedding¹ between Prince William and Kate Middleton, and the NCAA's March Madness^{®2} basketball tournament.

Within North America specifically, the continued growth of on-demand applications is largely fuelled by the runaway success of Netflix³, which now accounts for 29.70% of peak period downstream traffic. This share represents a 44% increase over the figure presented in the Fall 2010 study. Even when measuring total traffic and averaging over 24 hours, Netflix, with 22.2% of traffic, has overtaken BitTorrent (21.6%) as the largest component of Internet traffic on North America's fixed access networks.

Did you know?

The Internet is increasingly being used to stream live events, including:

- YouTube streaming cricket matches from the Indian Premier League
- Canada's CBC network streaming Hockey Night in Canada[®]
- PGA streaming specific holes from major golf tournaments

Did you know?

Netflix is the undisputed bandwidth leader on North America's fixed access networks. Consider:

- Netflix accounts for 29.7% of peak period downstream traffic
- Even when averaged over the entire day, and when including both upstream and downstream traffic, Netflix is #1

For more information, download the *Global Internet Phenomena Spotlight: Netflix Rising* from sandvine.com.



Second, the continued growth of Real-Time Entertainment enables a seemingly contradictory conclusion: P2P Filesharing is here to stay, at least for the immediate future, as evidenced by the marginal drop in share from 19.2% of peak period traffic in Fall 2010 to 18.8% in Spring 2011. Despite the emergence of an "on-demand" mentality, P2P networks have maintained a relatively consistent share of Internet traffic, and absolute volumes continue to increase. Opinions no doubt remain divided as to whether P2P's staying power is evidence of widespread piracy or mainstream acceptance of the ease of distribution that P2P networks like BitTorrent provide for content creators.

In Europe and Latin America, traffic profiles show a mix of steadiness and change. The composition of upstream traffic on Latin America's mobile networks has changed dramatically since the previous study. P2P Filesharing has supplanted Real-Time Entertainment to become the largest consumer of upstream capacity, accounting for 46.4% of uploaded bytes. Latin America is largely a fixed-replacement market, so one potential explanation for the preponderance of P2P Filesharing traffic is the increasing prevalence of laptops on these maturing networks. However, despite the major changes to upstream traffic composition, peak period aggregate composition has remained fairly consistent over the past 6 months.

1. For more pomp and pageantry, and graphs illustrating the global phenomena that was The Royal Wedding, download Sandvine's *Global Internet Phenomena Spotlight: The Royal Wedding*
2. To learn about the impact of March Madness on North America's networks, download Sandvine's *Global Internet Phenomena Spotlight: March Madness on Demand*
3. For more on the phenomenon that is Netflix, download Sandvine's *Global Internet Phenomena Spotlight: Netflix Rising*

It is difficult to identify year-over-year trends in Europe, because it seems like the continent's networks reflect rapidly shifting user preferences. Levels of P2P Filesharing and Web Browsing traffic have changed dramatically since 2009, with no consistent trend appearing. Nevertheless, an important exception in this dynamic market is the Real-Time Entertainment category, which continues to grow steadily. In 2009, this category accounted for 30.4% of aggregate bytes during peak period, but steady growth has led to the category generating 33.2% of all bytes in the Spring 2011 study window. Consequently, regardless of the continuing changes taking place on Europe's fixed access networks, subscribers are embracing on-demand entertainment applications.

With so many diverse factors impacting subscribers' online behaviour, including evolving devices, a wide array of billing models, and the continued availability of new online services, it is no wonder that Internet traffic is always changing.

Pomp, Pageantry...and Live Streams

On Friday, April 29th, 2011, Prince William and Kate Middleton entered Westminster Abbey in London and emerged as the Duke and Duchess of Cambridge. The Royal Wedding was a truly global event, with a total online and television audience measuring in the billions.

In the weeks and days leading up to the wedding, chatter on social networks reached a fevered pitch as royal-watchers and casual observers alike prepared for the occasion. Many industry observers predicted that the wedding would be one of the largest online events in history. Sandvine delivered a special study, *Global Internet Phenomena Spotlight: The Royal Wedding* to investigate the wedding's impact on networks worldwide.

The analysis revealed some interesting highlights, including:

- Real-Time Messaging Protocol (RTMP) traffic doubled, and global video traffic in general surged to 26% above normal levels, peaking during the wedding ceremony itself
- Traffic on the social media sites Twitter and Facebook peaked 30% and 10%, respectively, above normal levels and local peaks corresponded with highlights of the wedding coverage
- Levels of Octoshape, a proprietary streaming platform used for large-scale online events (most recently President Barack Obama's inauguration and Michael Jackson's memorial service) increased to 60 times the normal level

The Royal Wedding was big enough to shift the global make-up of Internet traffic, and not only when measured in terms of video traffic, which is evidence that many users are turning to the Internet to experience events that are typically the exclusive domain of television broadcasts.



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Analysis of Regional Network Traffic Profiles

North America: Fixed Access Networks

Examination of Internet traffic on fixed access networks in North America leads to a number of broad trends and conclusions.

First, Real-Time Entertainment traffic continues to grow, and now accounts for almost half (49.2%) of all bytes traversing the network during the peak evening hours. As recently as 2009, this category accounted for only 29.5% in the same period, so the emergence and ultimate dominance of these applications has been a relatively sudden (although not unexpected) phenomenon. At this rate of growth, Real-Time Entertainment will represent 55-60% of peak period bytes by the end of the year. It also warrants mention that while Social Networking has fallen out of the top 5 list in this study, it has not fallen far; Social Networking is the sixth largest category, and contributes 2.1% of peak period bytes.

Further Reading

Sandvine has published a study focusing specifically on North America's fixed access networks, *Global Internet Phenomena Spotlight: North America, Fixed Access, Spring 2011*, which includes deeper examination of the region's trends and statistics.

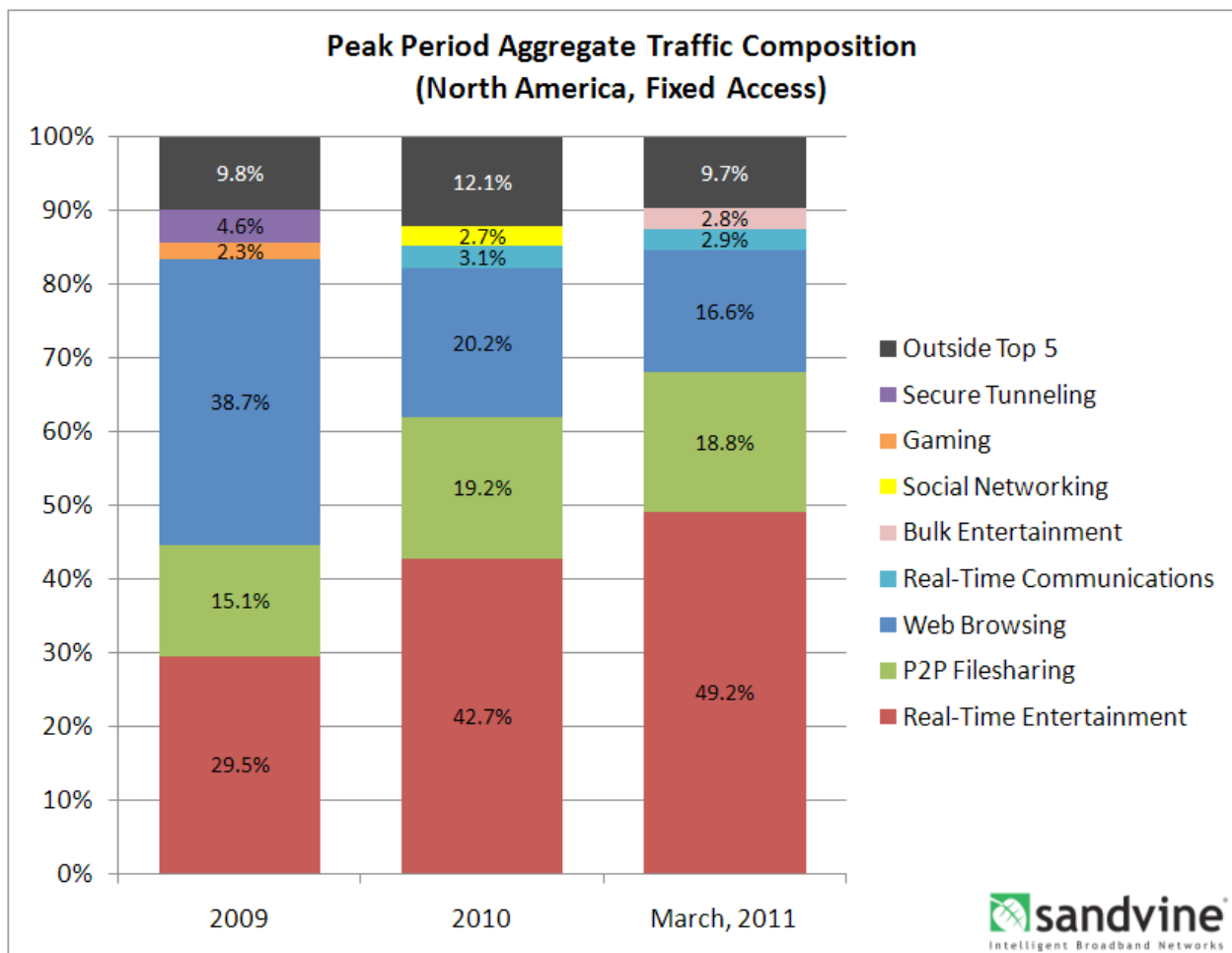



Figure 1 - Peak Period Aggregate Traffic Composition - North America, Fixed Access

Second, Netflix is now the unquestioned king of North America's fixed access networks. Even when measuring total traffic and averaging over 24 hours, Netflix, with 22.2% of traffic, has overtaken BitTorrent (21.6%) as the largest component of Internet traffic on North America's fixed access networks.

Table 1 - North America, Fixed Access, Peak Period, Top Applications by Bytes

Rank	Upstream		Downstream		Aggregate	
	Application	Share	Application	Share	Application	Share
1	BitTorrent	52.01%	Netflix	29.70%	Netflix	24.71%
2	HTTP	8.31%	HTTP	18.36%	BitTorrent	17.23%
3	Skype	3.81%	YouTube	11.04%	HTTP	17.18%
4	Netflix	3.59%	BitTorrent	10.37%	YouTube	9.85%
5	PPStream	2.92%	Flash Video	4.88%	Flash Video	3.62%
6	MGCP	2.89%	iTunes	3.25%	iTunes	3.01%
7	RTP	2.85%	RTMP	2.92%	RTMP	2.46%
8	SSL	2.75%	Facebook	1.91%	Facebook	1.86%
9	Gnutella	2.12%	SSL	1.43%	SSL	1.68%
10	Facebook	2.00%	Hulu	1.09%	Skype	1.29%
	Top 10	83.25%	Top 10	84.95%	Top 10	82.89%

SOURCE: SANDVINE NETWORK DEMOGRAPHICS



Third, the continued growth of Real-Time Entertainment enables a seemingly contradictory conclusion: P2P Filesharing is here to stay. Despite the emergence of an “on-demand” mentality, P2P has maintained a consistent share of Internet traffic.

Netflix Rising: Canadians are getting their fix of Netflix

Netflix is the largest driver of peak period traffic on North America’s fixed access networks, accounting for almost a quarter of total bytes and nearly 30% of downloads.

While the company currently offers their services only within the United States and Canada, they have not been shy about plans to expand further internationally. In an April 2011 interview with Business Insider, when asked about to where he sees Netflix expanding in the future, CEO Reed Hastings responded with “all the markets where people have broadband and like TV”¹. Subsequent conversations suggest Brazil, Mexico, and the United Kingdom top Netflix’ list.

Is there any way for service providers to see what a Netflix expansion into their region might mean? Sandvine’s home country of Canada offers such an opportunity.

In September 2010, Netflix launched their service in Canada and by the end of March 2011 counted over 800,000 registered users. This user base represents a market penetration of approximately 10% of the country’s broadband households, and Netflix traffic rapidly rose to consume 13.5% of downstream traffic during the evening’s peak hours.

The quick and widespread adoption is due in part to the fact Netflix has been aggressive about investing in content and services that are important to Canadians. Despite generating \$12 million in revenue last quarter, the Canada business unit still lost \$11 million due to spending on content licensing deals.² Some of these deals included content that was Canadian produced as Netflix reached an agreement with Canada’s national public broadcaster, the Canadian Broadcasting Company (CBC). Netflix also dedicated resources to create a control panel that allows users to control the quality of the video stream to address subscriber concerns about exceeding monthly usage caps.

With the rapid success of Netflix in Canada, Internet providers worldwide, regardless of access technology and degree of mobility, must plan for a future in which on-demand video (whether provided by Netflix or another service) is a large proportion, if not the majority of, last-mile traffic.

For more information, download *Global Internet Phenomena Spotlight: Netflix Rising* from sandvine.com.


1. For more information, read the article “What Netflix CEO hopes U.S. won’t notice” by Etan Vlessing at: <<http://www.hollywoodreporter.com/news/what-netflix-ceo-hopes-us-28218>>
 2. See “Netflix Could Pick Up Pace of International Expansion”.<<http://blogs.investors.com/click/index.php/home/60-tech/2410-netflix-could-pick-up-pace-of-international-expansion>>

Finally, this report shows that subscriber consumption in North America continues a rapid upwards trend, with median monthly usage increasing from 4 GB to 7GB in only six months, and mean consumption rising from 15 GB to 23 GB in that same period. The top subscribers continue to account for a disproportionate percentage of total subscriber consumption - almost half (49.7%) of upstream monthly usage originates with 1% of the subscriber base, and more than a quarter (25.13%) of downstream bytes are destined for 1% of subscribers.

Table 2 - North America, Fixed Access, Monthly Consumption Statistics

	Monthly Consumption - North America, Fixed Access		
	Mean	Median	Mean : Median Ratio
Upstream	4.5 GB	600 MB	7.33
Downstream	18.6 GB	6.0 GB	3.06
Aggregate	23.0 GB	7.0 GB	3.28

SOURCE: SANDVINE NETWORK DEMOGRAPHICS



When life demands live action

March Madness, the 68-team NCAA (National Collegiate Athletic Association) men’s basketball tournament held each March is something with which most North Americans are familiar. Every year the event brings out students and alumni to cheer for their school, and office bracket pools make basketball converts even out of non-fans.

The 2011 tournament television ratings were the highest since 2005¹, even with every single game being available for free online through March Madness On Demand (MMOD).

During the tournament, 21% of active subscribers on a major North American fixed network used the MMOD service at some point. A user tuning in every day and exhibiting average consumption would consume more than 1 GB of data over the 23 day tournament.

While these figures indicate that March Madness 2011 was a significant online event, it is important to note that despite making all games available via the MMOD website and mobile application, overall viewership went up both online and on television. This suggests that by offering online viewing options, broadcasters can gain additional viewers even for traditional media.

Might other major events go the same route? In just the past year, several other sports leagues and networks have taken their services online to reach a wider audience, including:

- YouTube streaming games of cricket matches of India’s Premier League²
- CBC in Canada streaming all of their NHL Hockey Night in Canada broadcasts³
- PGA live streaming specific holes of major tournaments⁴
- FIFA streaming all of the 2010 World Cup matches⁵

This trend will impact both fixed and mobile operators as broadcasters put more sporting and newsmaking events online and users increasingly expect to be able to view them anywhere, anytime.

For more information, download Sandvine’s *Global Internet Phenomena Spotlight: March Madness On Demand* from sandvine.com.



1. See “March Madness ratings on TV best since 2005.” <<http://www.washingtontimes.com/news/2011/mar/28/march-madness-ratings-on-tv-best-since-2005/>>
 2. Cricket fans can read “Indian Premier League returns to YouTube” <<http://youtube-global.blogspot.com/2011/04/indianpremier-league-returns-to.html>>
 3. Canucks were happy to find that “All Hockey Night in Canada games will be streamed online” <<http://www.insidethecbc.com/hniconline/>>
 4. To view more information, visit: <<http://www.pgatour.com/livegolf/>>
 5. Sandvine has posted a blog entry on this subject, “The World is Watching - Are Service Providers?” <<http://www.betterbroadbandblog.com/2010/06/the-world-is-watching-%E2%80%93-are-service-providers/>>

Latin America: Mobile Access Networks

The composition of upstream traffic on Latin America’s mobile networks has changed dramatically since the Fall 2010 study. P2P Filesharing has supplanted Real-Time Entertainment to become the largest consumer of upstream capacity. In fact, P2P Filesharing represents 46.4% of total upstream traffic, well ahead of Web Browsing (15.4%) and Social Networking (13.0%).

Latin America is largely a fixed-replacement market, meaning that subscribers use a mobile data connection as a substitute for a fixed broadband connection. Consequently, one potential explanation for the preponderance of P2P Filesharing traffic is the increasing prevalence of laptops on these maturing networks. While P2P Filesharing applications do exist for handsets and tablets, laptops generally exhibit higher levels of P2P Filesharing traffic. It is possible that the growth in P2P Filesharing simply reflects a changing device landscape from handsets (with limited P2P support and smaller storage) to laptops, with massive hard drives and larger appetites.

Further Reading

Sandvine has published a study focusing specifically on Latin America’s mobile access networks, *Global Internet Phenomena Spotlight: Latin America, Mobile Access, Spring 2011*, which includes deeper examination of the region’s trends and statistics.

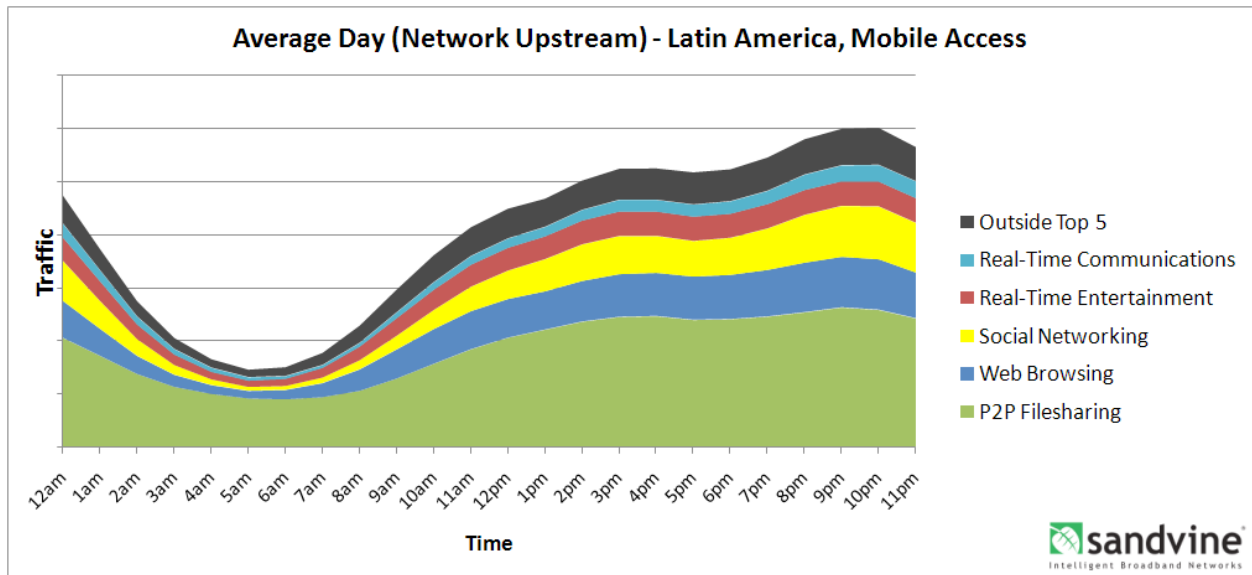


Figure 2 - Average Day (Network Upstream) - Latin America, Mobile Access

Nevertheless, many mobile networks in Latin America are still at the early stages of growth, and feature phones are the most common devices. Consequently, data usage is relatively low, with median monthly usage of 58.1 MB and mean monthly usage of 893.7 MB. Consumption is not equitably distributed, and profiles of subscriber data usage tend to cluster based on factors like device type (feature phone vs smart phone vs tablet or laptop) and data plan.

Did you know?

Latin America is largely a fixed-replacement market, so the mobile connection is frequently the subscriber’s only Internet subscription. This reality has major implications on the make-up of the region’s traffic.

Table 3 - Latin America, Mobile Access, Monthly Consumption Statistics

	Monthly Consumption - Latin America, Mobile Access		
	Mean	Median	Mean : Median Ratio
Upstream	151.2 MB	8.3 MB	18.07
Downstream	742.5 MB	48.8 MB	15.21
Aggregate	893.7 MB	58.1 MB	15.39

SOURCE: SANDVINE NETWORK DEMOGRAPHICS



This year's forecast: increased cloudiness

A significant portion of traffic is associated with online back-up and file storage sites. To-date, no single site has secured dominance, as the popularity of services varies between regions and new competitors are still entering the market.

Behaviorally, this category can be broken into two different types. The first is focused on uploading and storing individual files. Much of the traffic associated with these sites is not from personal file back-up, but instead is a substitute for P2P Filesharing. These sites typically offer limited uploading and downloading for free, with users having the option to purchase additional space and bandwidth for a small fee. Examples of popular individual file storage sites include MegaUpload, RapidShare, and zShare.

The second type of storage service is focused on large-scale personal back-up for disaster recovery or remote access; frequently, the back-up is configured to run periodically and automatically. These services charge a monthly fee so that the users have a permanent offsite back-up of their most important files. With more users having larger libraries of music, video, and photos that are important to them, the amount of traffic these sites generate can be significant. Examples of popular computer back-up sites include Mozy, Carbonite, and Dropbox.

We expect online storage and back-up usage to increase in tandem with smartphone and tablet adoption, with users relying on these services to access their files remotely. Major players like Microsoft (SkyDrive) and Amazon (Cloud Drive) are wading into this market. These companies have the extensive infrastructure and install-base of platforms to reach a large number of users; economies of scale let them offer their service for no or limited cost. Should these products gain traction with users, and other companies such as Google or Apple launch competing services, cloud storage has the potential to become a major source of traffic on the internet.

Top 25 Websites			
Website	Change	Current	Previous
megaupload.com	--	6	6
fileserve.com	↓	11	10
filesonic.com	--	18	18
putlocker.com	↑	24	25

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Snippet of a Network Analytics "Top 25 Websites" report showing four online storage sites among the Top 25 by total bytes



Despite the major changes to upstream traffic composition in Latin America, peak-period aggregate composition has remained fairly consistent over the past 6 months. Web Browsing represents about a quarter (24.9%) of total traffic and has remained relatively constant in the past 14 months. Real-Time Entertainment has fallen to 27.5%, but is still the largest constituent of total traffic, while P2P Filesharing has rebounded to represent 18.0% of peak aggregate traffic. Social Networking grew slightly and now accounts for 13.7% of the region's peak period mobile traffic.

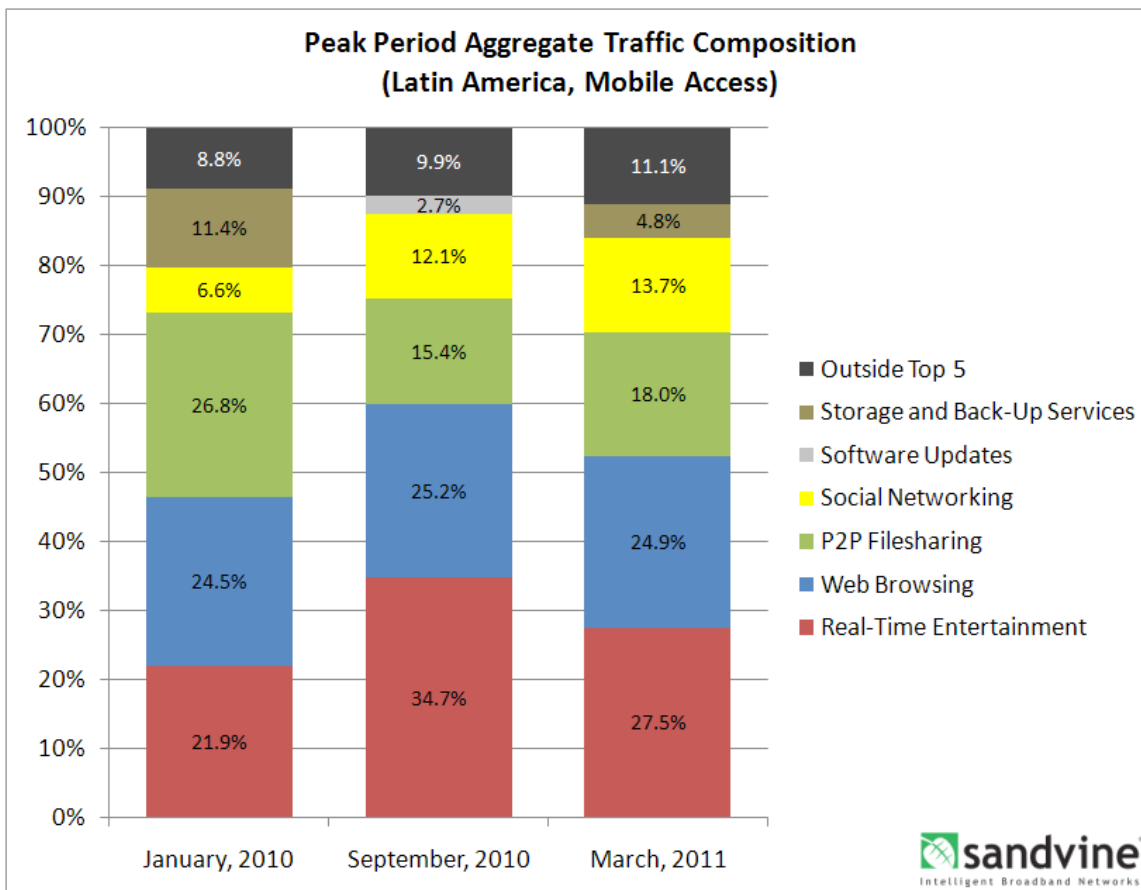


Figure 3 - Peak Period Aggregate Traffic Composition - Latin America, Mobile Access

The applications driving this evening usage profile are HTTP, Ares, Facebook and YouTube, which combine to represent 66.1% of total traffic.

Did you know?

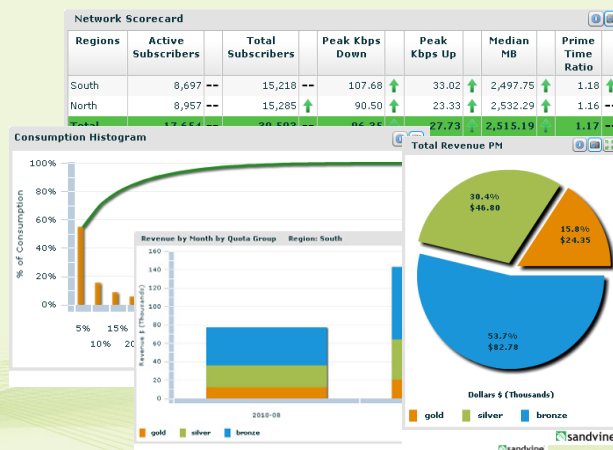
Facebook is hugely successful in Latin America, and accounts for 13.25% of total peak period traffic on the region's mobile networks.

Sandvine's Network Analytics

Right-time information for real-life decisions

Sandvine's Network Analytics gets the data out of the network and brings it to the boardroom. Network Analytics is a sophisticated analysis tool that empowers confident business decisions through network-wide visibility¹.

Unlike data gleaned from billing and operations systems alone, Network Analytics provides real network statistics with application-level, subscriber-aware intelligence; this powerful combination bridges the gap between critical operations' systems enabling insightful analysis and measurable business impact.




1. To see videos of Network Analytics in action, visit: http://www.sandvine.com/products/network_analytics.asp

Table 4 - Latin America, Mobile Access, Peak Period, Top Applications by Bytes

Rank	Upstream		Downstream		Aggregate	
	Application	Share	Application	Share	Application	Share
1	Ares	39.22%	HTTP	26.78%	HTTP	24.79%
2	HTTP	15.74%	YouTube	14.76%	Ares	15.48%
3	Facebook	15.41%	Facebook	12.77%	Facebook	13.25%
4	BitTorrent	3.60%	Ares	10.26%	YouTube	12.58%
5	YouTube	2.65%	Google Video	6.08%	Google Video	5.12%
6	Skype	2.35%	Flash Video	5.92%	Flash Video	5.06%
7	SSL	2.34%	MegaUpload	4.08%	MegaUpload	3.45%
8	MSN Messenger	2.03%	Windows Update	3.50%	Windows Update	2.99%
9	Hotmail	1.40%	Shockwave Flash	1.50%	BitTorrent	1.73%
10	Pando	1.33%	SSL	1.46%	SSL	1.62%
	Top 10	86.07%	Top 10	87.11%	Top 10	86.07%

SOURCE: SANDVINE NETWORK DEMOGRAPHICS



As Latin America’s subscribers continue to invest in mobile Internet data plans on increasingly powerful devices, the region’s network operators should see data consumption rise dramatically, driven primarily by Real-Time Entertainment (in areas of high quality of service), P2P Filesharing (driven by laptops), and Web Browsing (partially powered by mobile apps).

Do you roam at home?

In a recent study conducted by Google, 72% of smartphone owners said they used their devices while consuming other media.¹ Where are most of these mobile subscribers when using a “second screen”? At home.

As smartphone ownership rates continue to increase, people are turning to their mobile devices as powerful tools to look up information on-the-go. Think of the living room experience: when watching TV at home, if a user sees an advertisement for a movie, it’s much quicker and easier to pull out a smartphone or tablet to look up showtimes or find a trailer than to use a laptop or desktop computer. Most users don’t stop to consider whether the traffic is coming through the home’s WiFi connection or over the mobile provider’s network.

Because all major smartphone platforms have the capability to seamlessly transition from the mobile network to WiFi networks, many providers are increasingly seeing traffic from mobile devices on their fixed access networks. Anecdotally, URLs like “m.facebook.com” (Facebook’s mobile site) regularly appear in the top website reports from fixed networks worldwide.

In some cases, high bandwidth mobile applications require a WiFi connection in order to work. The most prominent example of this minimum requirement is Apple’s FaceTime video calling feature. Originally introduced with the launch of the iPhone 4, the application can only make video calls when on a WiFi network and any attempt to connect over the mobile network will fail.

The growing trend of mobile device traffic on fixed networks will only continue as more tablets enter the marketplace. Exactly what it means for the world’s fixed providers remains to be seen, but it is a trend worth watching.



1. Google’s survey results can be found at: <http://googlemobile.blogspot.com/2011/04/79-of-smartphone-consumers-use-their.html>

Europe: Fixed Access Networks

Per-subscriber monthly consumption in Europe is relatively high in global terms, with median monthly usage of 14.7 GB (more than double the North American figure of 7 GB) and mean usage of 40 GB (contrast to North America's figure of 23 GB). A significant portion of this usage is BitTorrent, which alone accounts for 28.40% of total traffic during the evening's peak hours.


Further Reading

Sandvine has published a study focusing specifically on Europe's fixed access networks, *Global Internet Phenomena Spotlight: Europe, Fixed Access, Spring 2011*, which includes deeper examination of the region's trends and statistics.

Table 5 - Europe, Fixed Access, Monthly Consumption Statistics

Monthly Consumption - Europe, Fixed Access			
	Mean	Median	Mean : Median Ratio
Upstream	8.2 GB	1.2 GB	6.87
Downstream	31.3 GB	12.7 GB	2.47
Aggregate	39.6 GB	14.7 GB	2.69

SOURCE: SANDVINE NETWORK DEMOGRAPHICS



Did you know?

Europe's median monthly subscriber consumption (14.7 GB) is more than double that in North America (7 GB).

It is difficult to identify year-over-year trends in Europe, because it seems like the continent's networks reflect rapidly shifting user preferences. Levels of P2P Filesharing and Web Browsing traffic have changed dramatically since 2009, with no consistent trend appearing. Europe is a region of cultural and language diversity (both of which drive demand for localized content), and networks at different stages of growth, and Europe's subscribers have not settled into particular usage habits.

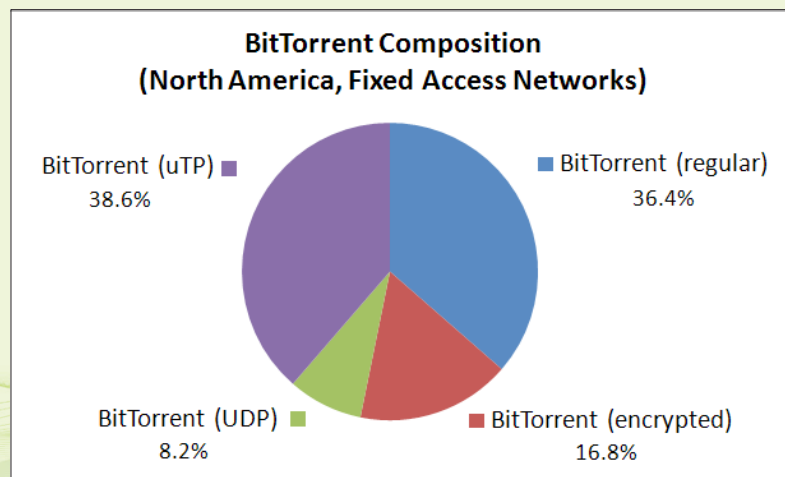
An important exception in this dynamic market is the Real-Time Entertainment category, which continues to grow steadily. In 2009, this category accounted for 30.4% of aggregate bytes during peak period, but steady growth has led to the category generating 33.2% of all bytes in the window covered by this study. Consequently, regardless of the continuing changes taking place on Europe's fixed access networks, subscribers are embracing on-demand entertainment applications and the continent's service providers should expect to see this trend continue at the expense of Web Browsing and P2P Filesharing.

A torrent of protocols

BitTorrent continues to be the dominant P2P network globally, representing about 90% of total P2P traffic (one exception to this is in Latin America where the Ares file sharing network remains popular). However, what's referred to generally as BitTorrent (including within this report) is actually several sub-protocols.

When BitTorrent first debuted, we differentiated between "BitTorrent", referred to as "BitTorrent (regular)" in the accompanying figure, and "BitTorrent (UDP)". As encryption techniques appeared, we responded by recognizing this traffic as "BitTorrent (encrypted)". Finally, when µTorrent popularized the uTP protocol, we introduced a "BitTorrent (uTP)" recognizer.

On most fixed access networks globally, BitTorrent's constituent sub-protocols have relative shares close to the figure in the chart to the right.



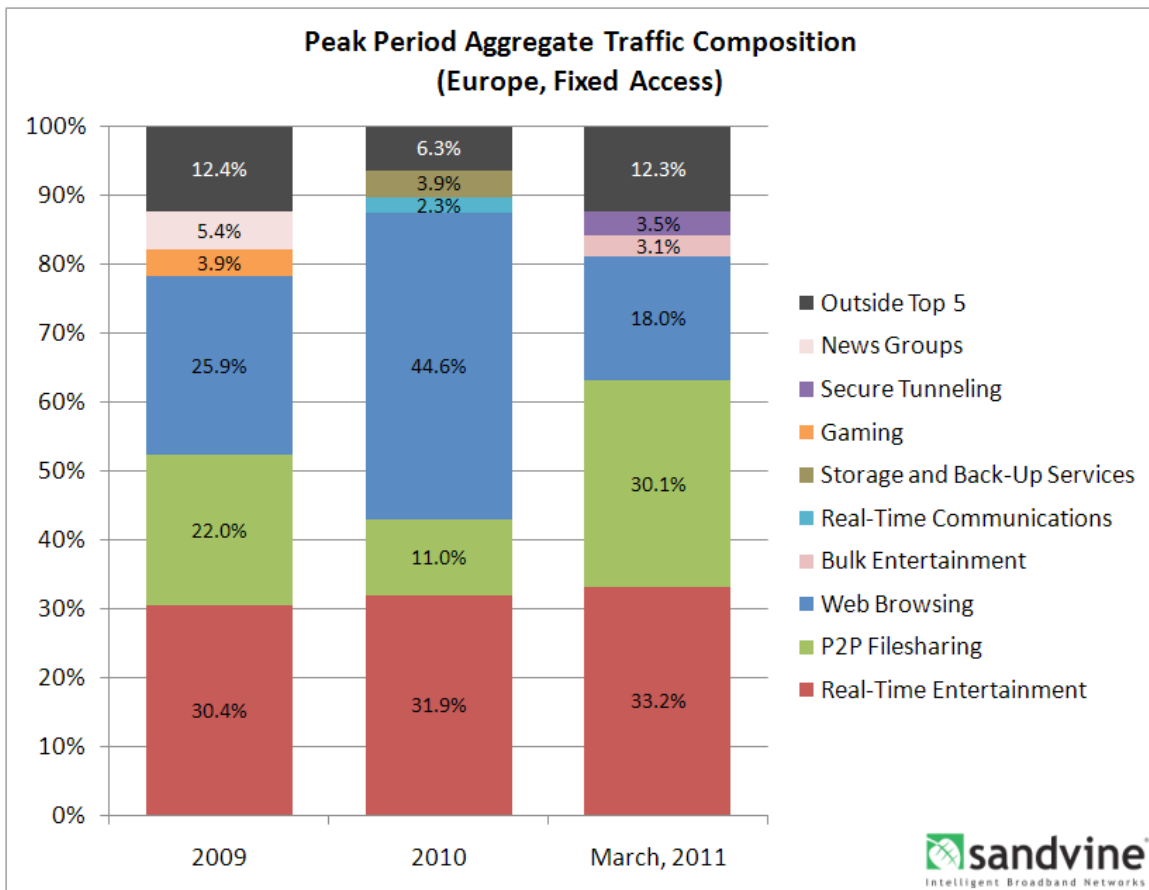


Figure 4 - Peak Period Aggregate Traffic Composition - Europe, Fixed Access

One factor driving the growth of the Real-Time Entertainment category is the availability of services like Spotify and BBC iPlayer. Currently, both these services enforce geographic restrictions that limits their wider availability. In the United Kingdom, BBC iPlayer comprises 6.6% of peak downstream traffic; however, outside this zone it is negligible, since it is limited to subscribers who have implemented technical workarounds. Similarly, Spotify is a significant portion of Europe's overall traffic⁴, but its exact percentage varies based on the availability of its various account types. Should either of these services expand their geographic availability, then Internet providers can expect the growth of Real-Time Entertainment traffic to accelerate.

Did you know?

BBC's iPlayer streaming service accounts for 6.6% of peak period downstream traffic in the United Kingdom, but due to geographic restrictions it is not available elsewhere in Europe.

4. Spotify is currently available in Sweden, Spain, Norway, Finland, France, the Netherlands and the United Kingdom

For Europe in general, BitTorrent, HTTP and YouTube are the dominant components of broadband traffic - combined, they account for almost 60% of peak period bytes.

Table 6 - Europe, Fixed Access, Peak Period, Top Applications by Bytes

Rank	Upstream		Downstream		Aggregate	
	Application	Share	Application	Share	Application	Share
1	BitTorrent	59.68%	BitTorrent	21.63%	BitTorrent	28.40%
2	Skype	7.16%	HTTP	20.47%	HTTP	18.08%
3	HTTP	7.02%	YouTube	14.13%	YouTube	11.93%
4	PPStream	3.64%	RTMP	4.58%	RTMP	3.90%
5	Spotify	2.91%	Flash Video	3.99%	Flash Video	3.38%
6	SSL	2.66%	iTunes	3.65%	SSL	3.09%
7	eDonkey	1.76%	SSL	3.18%	iTunes	3.07%
8	YouTube	1.76%	NNTP	2.73%	Skype	2.44%
9	Facebook	1.42%	Facebook	1.71%	NNTP	2.30%
10	Teredo	1.18%	Skype	1.42%	PPStream	1.77%
	Top 10	89.19%	Top 10	77.49%	Top 10	78.36%

SOURCE: SANDVINE NETWORK DEMOGRAPHICS



Your tunes, my tunes, we all scream for iTunes

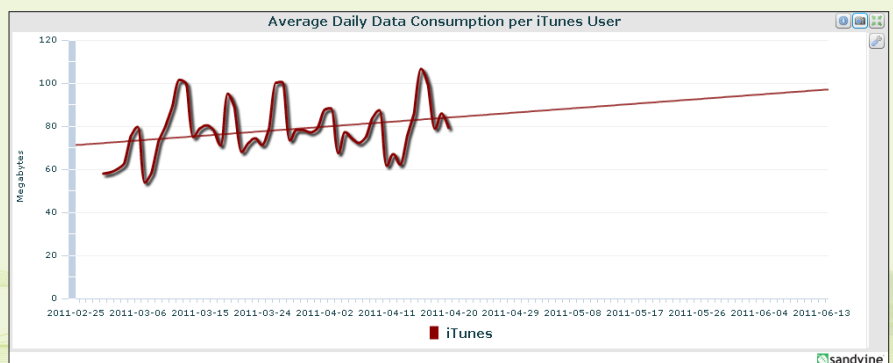
Apple's iTunes service now accounts for over 3.5% of total downstream traffic in North America, and more than 30% of active subscribers access iTunes on a typical day. These users average 80 MB of iTunes data per day, and daily consumption continues to rise. The service's popularity isn't limited to North America; in Europe, iTunes represents more than 3% of downstream bandwidth during peak period on fixed access networks.

While that remains a relatively small amount of total traffic in comparison to a service like Netflix, it still represents 35% share growth in North America over the last 6 months.

What can cause a well-known service to surge so much in such a short period? Because a variety of content (music, movies, television, applications, books, software updates) is accessed through one portal there are a number of possibilities, but here are the most likely culprits:

- Continued growth of the iOS platform with iPhones, iPads, and iPod Touches getting all of their applications (and subsequent updates) either through the iTunes client or over-the air update
- Launch of a new Apple TV in September 2010 that offers streaming television show rentals for \$0.99, less than 24 hours after broadcast
- Strengthening of Apple's position as the largest digital music provider, with an estimated two-thirds of total market share¹

It appears that iTunes data usage (overall and per-subscriber) will continue to increase in the months ahead in conjunction with the growth of the iOS platform. Will the growth be smooth, or will it be buoyed by new developments? For instance, what if Apple launches a digital music locker service to compete with Amazon's recently launched Cloud Drive and Cloud Player and Google's music service?²



1. See "Amazon Can't Dent iTunes." <<http://online.wsj.com/article/SB10001424052748704073804576023913889536374.html>>
 2. For more information on Google's recent announcement, see: <<http://music.google.com/about/>>

Study Details

Sandvine's *Global Internet Phenomena Reports* examine a representative cross-section of the world's leading fixed and mobile data providers and are made possible by the voluntary participation of our customers. Collectively, Sandvine's customers provide Internet and data service to hundreds of millions of subscribers worldwide.

The data gathered for these reports is completely subscriber-anonymous. No information regarding specific content or subscriber identity (including IP or MAC addresses) was collected during this study.

This study examined Internet traffic in March 2011 from three regions:

- North America
- Latin America
- Europe

This study reflects the traffic profiles of real service providers, including the impact of any network management policies that may be in place.

The data collected includes the bits per second per protocol and the number of active hosts per protocol on the network at each hour. Data also includes the total transmitted (upstream) and received (downstream) bytes, from the subscriber's perspective, attributable to each subscriber for the 30 days, 7 days, and 1 day preceding the time of data collection.

The datasets were used to create a 24-hour profile of each network, normalized by the number of active subscribers at each hour in the day. These profiles were then aggregated hierarchically for each region with weightings based on subscriber counts.

The transmitted and received bytes per subscriber data sets were used to create ordinal rankings of all subscribers on a network based on a combination of data direction (upstream, downstream, aggregate) and data period (day, week, month), for a total of nine ranked lists ordered by total byte usage. These lists enabled consumption analysis based on percentile ranking and cast light on the widely varying data needs of individual subscribers.

In parts of the report we reference industry publications, analyst studies, media articles and other sources. As such, we are indebted to the collective work and wisdom of a large number of individuals and organizations and have endeavoured to correctly cite all sources.

Explanation of Categories

The table below describes each of the categories used in the *Global Internet Phenomena Report: Spring 2011*.

Category	Description	Example Applications and Protocols
Anonymity	Protocols that mask or obfuscate application or individual identity	Tor (The Onion Router)
Bulk Entertainment	Entertainment that is acquired in bulk then consumed sometime after arrival	iTunes, movie download services
Bulk Transfers	Large data transfers using the File Transfer Protocol or its derivatives	FTP (File Transfer Protocol)
E-mail	Service-provider and webmail e-mail services	SMTP, POP3, webmail (Hotmail, Gmail, etc), BlackBerry encrypted e-mail
Encapsulation Tunnelling	Tunnels used for wrapping traffic	L2TP, GRE, Teredo, 6 to 4
Gaming	Console and PC gaming, console download traffic, game updates	Nintendo Wii, Xbox Live, Playstation 2, Playstation 3, PC games (for example, World of Warcraft)
Network Administration	Protocols and services used to administer the network	DNS, ICMP, NTP, SNMP
News Groups	Network news services (where “news” means “data” - it doesn’t have to be actual news)	NNTP, encrypted NNTP (over SSL)
P2P Filesharing	File-sharing applications that use a peer-to-peer distribution model	BitTorrent, eDonkey, Gnutella, Ares, Winny, Share, Foxy, Pando
Real-Time Communications	Applications and protocols that allow interactive chat, voice, and video communications	Skype, MSN Messenger, ICQ, SIP, MGCP, AOL Instant Messenger (AIM), IRC, Oovoo, Jabber, Gadu-Gadu, MGCP, Facetime
Real-Time Entertainment	Applications and protocols that allow “on-demand” entertainment that is consumed (viewed or heard) as it arrives	Streamed or buffered audio and video (RTSP, RTP, RTMP, Flash), peercasting (PPStream, Octoshape), placeshifting (Slingbox, home media servers), specific streaming sites and services (Netflix, NCAA, Hulu, YouTube, Google Video, Spotify, BBC iPlayer)
Remote Connectivity	Protocols and services that allow remote access to network resources	Remote Desktop, VNC, PC Anywhere
Secure Tunnelling	Encrypted tunnels typically used for Virtual Private Networks and secure web transactions	SSL, SSH
Social Networking	Websites and services focused on enabling interaction (chat, communication) and information sharing (photos, status, etc) between users	Facebook, MySpace, Twitter, Habbo, Bebo
Software Updates	Application updates for software, firmware, and operating systems	Windows Update, anti-virus updates
Storage and Back-Up Services	Services that provide file-hosting, network back-up, and one-click downloads	PDBox, Netfolder, Rapidshare, MegaUpload, Mozy, zShare, Carbonite, Dropbox
Web Browsing	Web protocols and specific websites	HTTP, WAP browsing

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