Internet e novas mídias

Maio/2015 - aula 2

Igor Macaúbas

igor@corp.globo.com
igor@macaubas.com

Agenda

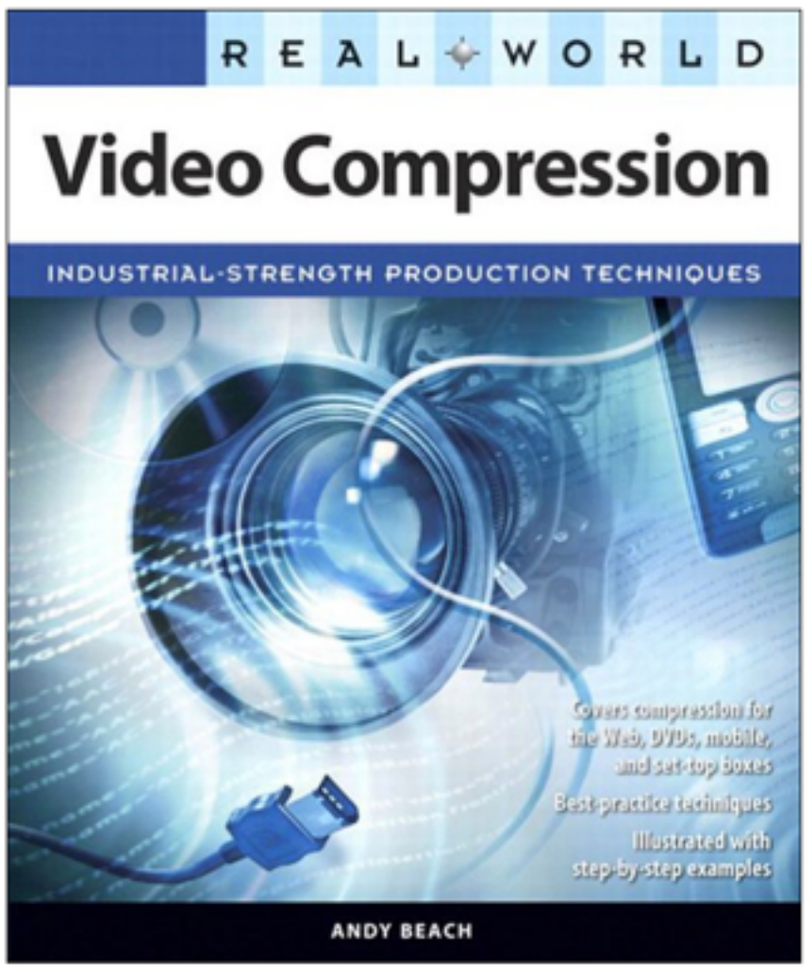
- Over-the-top
- Panorama de consumo de mídia na Internet
- Vídeo na Internet
  - Características
  - Mercado
  - Distribuição

WIRED

FAST COMPANY

WIKIPEDIA
The Free Encyclopedia

TechCrunch

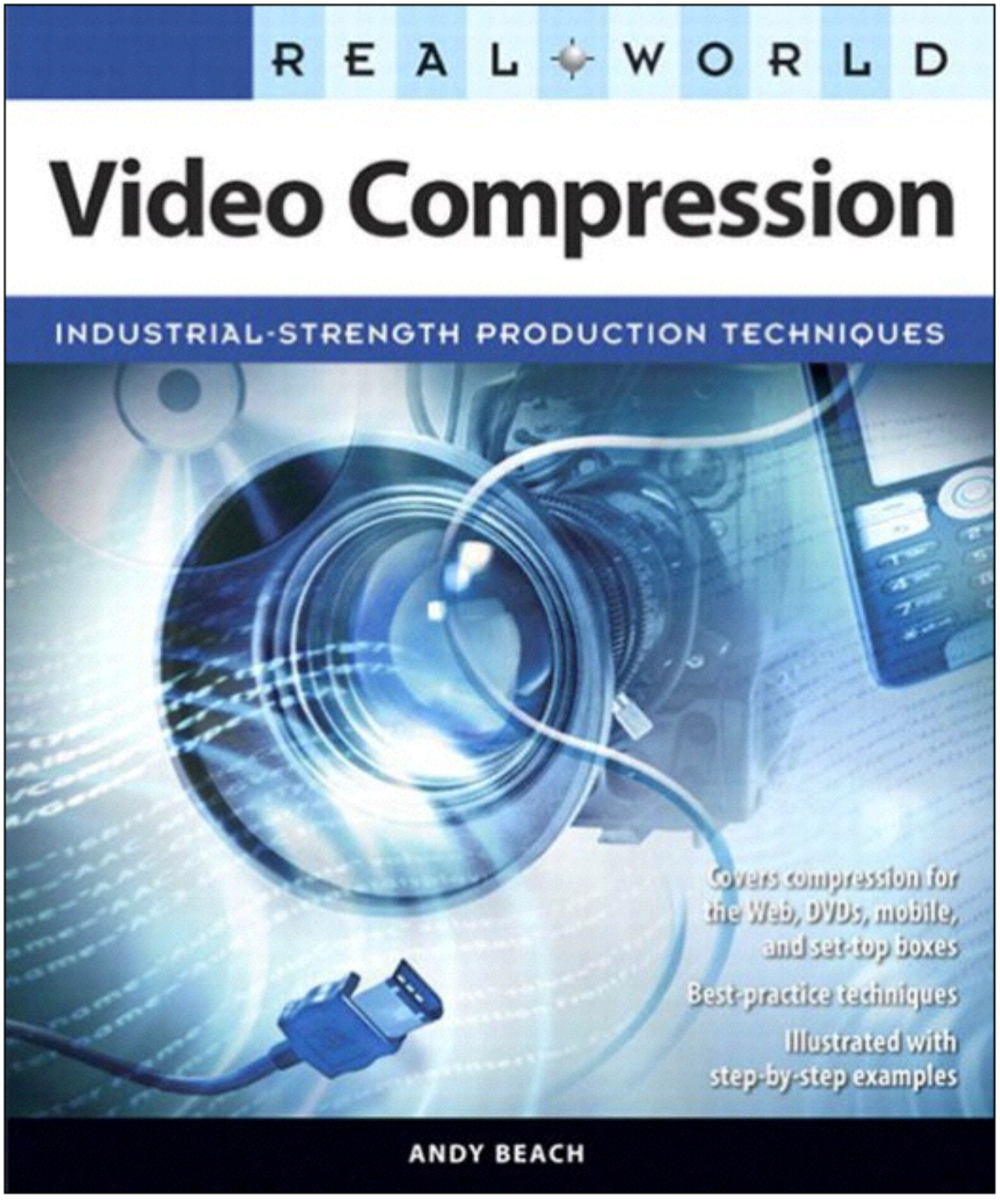


Slashdot

engadget

comScore

Referências



http://realworldvideocompression.com/

O que levou a Apple ao mercado de mídia online, inicialmente com música?

Porque a briga por formatos físicos entre o Blu-Ray e o HD-DVD não fazia sentido?

Quais as consequências dessa briga para a Microsoft?

Como a Nintendo também se aproveitou desta disputa entre a Sony e a Microsoft?

"A televisão nunca será séria concorrente do rádio, porque as pessoas precisam sentar e fixar seus olhos na tela. A família americana não tem tempo para isso".

The New York Times, 1939

WhatsApp-ening?

On a Tier-1 European mobile network, 10 WhatsApp messages are sent and recieved per subscriber each day.

3% of all messages sent have a media file attached.

Over the top

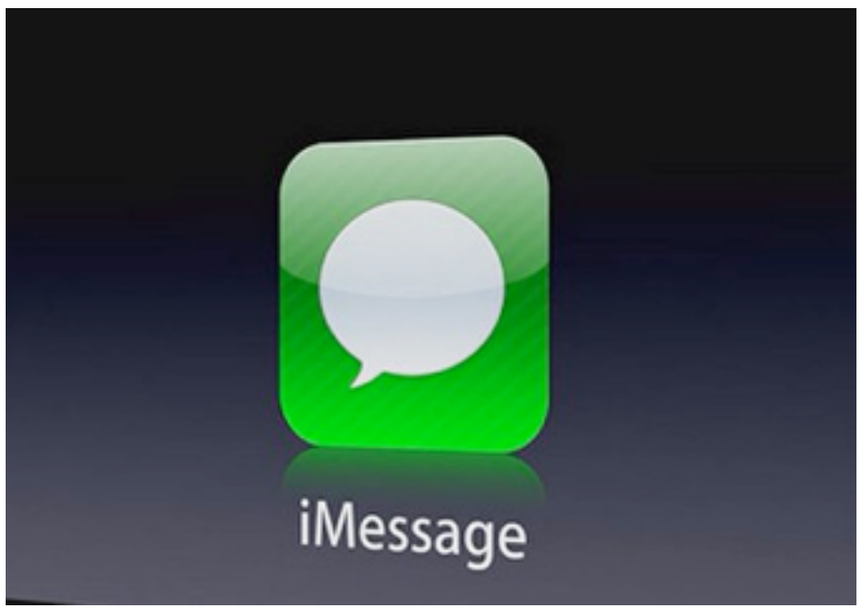
("*desintermediação*")


WhatsApp


kik.


skype™


Messenger
A faster way to message
by facebook


iMessage


Viber
Viber

apple / ios / iphone

3 reasons why iMessage won't kill SMS

by Colin Gibbs JUN. 8, 2011 - 10:45 AM PDT

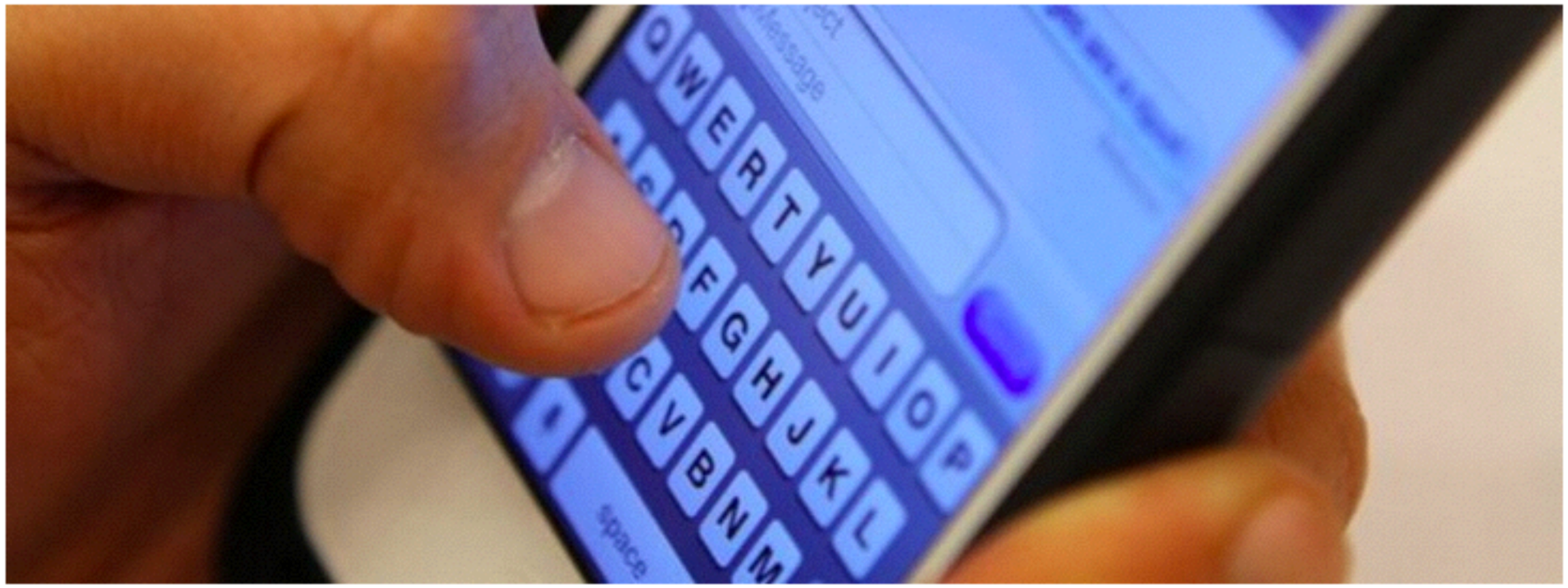
SUMMARY: *This week Apple unveiled iMessage, a feature that enables iOS users to exchange text messages and images without incurring carrier messaging charges. Despite headlines to the contrary, though, iMessage is not going to kill the cash cow that is SMS, for at least three reasons.*

Apple's iMessage Cannibalizes SMS But is No Threat to Operators

with 17 comments

A major part of Apple's new iOS software update is iMessage, which replaces the iPhone's standard SMS app. The iOS5 software is compatible with approximately 200m of the 250m total iOS devices sold, including both the older iPhone 3GS and iPhone 4 models, as well as the iPod Touch and iPad. It's also installed on all new devices including the iPhone 4S. As of today, over 25 million devices now have iMessage installed and Apple sold 4m iPhone 4S handsets on its first weekend on sale.

Yes, Apple's iMessage is killing the text message, and I love it



When Apple announced that iOS 5 would launch with support for its own communication service iMessage, it seemed to be a clear cut stab at the heart of one of the carrier's biggest money makers, text messaging. It was immediately obvious that this should have a huge impact on how carriers of the iPhone would be charging for these services in the future.

Matthew Panzarino
Contact Author

26 January 2012
Updated at 02:56 CET

Text messages decline as app-based messenger usage soars

By Raymond Wong on Nov 12, 2012 at 8:40 PM

Five reasons why texting apps like WhatsApp and iMessage are killing SMS

January 7, 2012

Many could see this coming: the end of text messages as we know them. From carriers around the world offering SMS bundles and packages as part of their contracts, all that people ask is that the smartphone in question will be able to run WhatsApp. I witnessed this recently at an Orange shop where a surprisingly knowledgable salesperson was asked if Nokia's Lumia 800 could be able to run Viber to make free international calls.

Disruptive innovation: WhatsApp killing SMS

March 1, 2013 in Opinion

IN 2009, when two ex-Yahoo software engineers, Brian Acton and Jan Koum launched a start-up firm called WhatsApp, they barely knew their instant messaging application would sound the death knell for short message service (SMS) and multimedia messaging service (MMS) businesses of our local mobile network operators (MNOs).

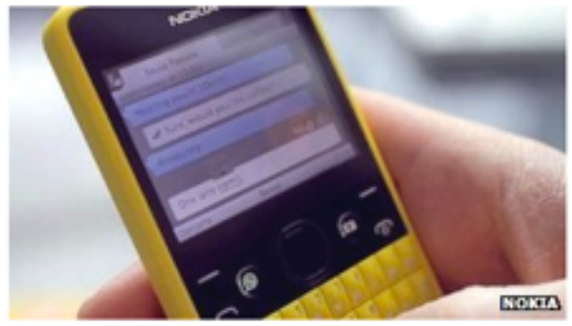
29 April 2013 Last updated at 07:23

Chat app messaging overtakes SMS texts, Informa says

Instant messaging on chat apps, such as WhatsApp, has overtaken the traditional SMS text message for the first time, according to research firm Informa.

Informa said almost 19 billion messages were sent per day on chat apps in 2012, compared with 17.6 billion SMS texts.

The shift is likely to have a big impact on mobile operators, for whom texts have been a key revenue source.



Nokia has launched a phone with a button dedicated to WhatsApp

Free texts are killing the SMS

FORTUNE

By JP Mangalindan, Writer April 30, 2013: 9:10 AM ET

Services like Apple's iMessage and WhatsApp that transmit messages over the Internet are wiping out billions in revenue.

COURTESY WHATSAPP

Mobile messaging apps like Apple's iMessage, WhatsApp, and Facebook Messenger are slowly killing off traditional texting.

18 bilhões de mensagens processadas num único dia!

Topics: Metrics and Analytics

SMS traffic and revenues decline for the first time ever in U.S., Chetan Sharma says

November 12, 2012 | By Jason Ankeny

SHARE

Email

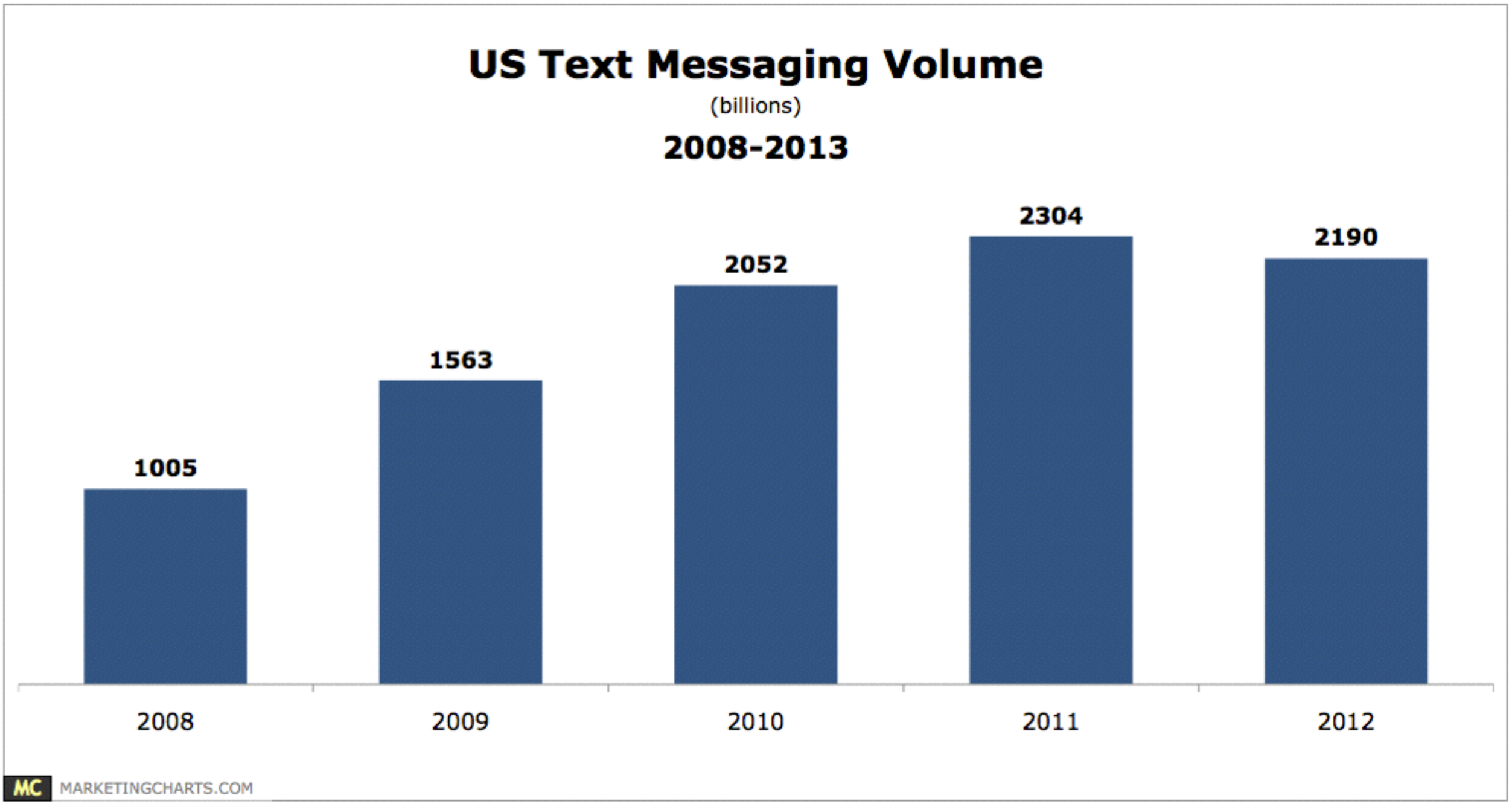
U.S. mobile operators raked in third quarter 2012 data revenues of $19.9 billion, up 3 percent quarter-over-quarter and 17 percent year-over-year--despite suffering their first-ever decline in overall text messaging traffic and revenues, according to new research from Chetan Sharma Consulting.

SMS and MMS sent Christmas and New Year 2010 and 2011

Operator and Country	Christmas / New Year	2010	2011
Telenor, Sweden (MMS)	Christmas	425,000	475,000
Telenor, Sweden (SMS)	Christmas	10.1 million	9.5 million
Telia, Sweden (SMS and MMS)	Christmas	24.2 million	24 million
Telia, Sweden (SMS)	New Year	29.6 million	28.4 million
Tele2, Sweden (SMS)	New Year	34.7 million	30.7 million
Sonera, Finland (SMS)	Christmas	10.9 million	8.5 million
DNA, Finland (SMS)	Christmas	5.9 million	5.6 million
Hong Kong (SMS)	Christmas	25.1 million	21.62 million
T-Mobile, Czech Republic (SMS)	Christmas	29.6 million	27.3 million
T-Mobile, Czech Republic (MMS)	Christmas	235,110	277,430
Cytamobile-Vodafone, Cyprus (SMS)	Christmas	N/A	7 million
Mobistar, Belgium (SMS)	Christmas	7.45 million	9.6 million
Proximus, Belgium (SMS)	Christmas	14.5 million	14.5 million
Base, Belgium (SMS)	Christmas	N/A	6.9 million
Vodafone, Hungary (MMS and SMS)	Christmas (3 days)	10 million	9 million
Telenor, Serbia (SMS)	New Year	32.7 million	37 million
Bouygues Telecom, France (SMS)	New Year	154 million	200 million
SFR, France (SMS)	New Year	125 – 146 million	183 million

US Text Messaging Volume Declined by 5% Last Year

May 3, 2013 by MarketingCharts staff



Source: CTIA-The Wireless Association

fonte: http://goo.gl/jtTPl

http://goo.gl/qK5HpP

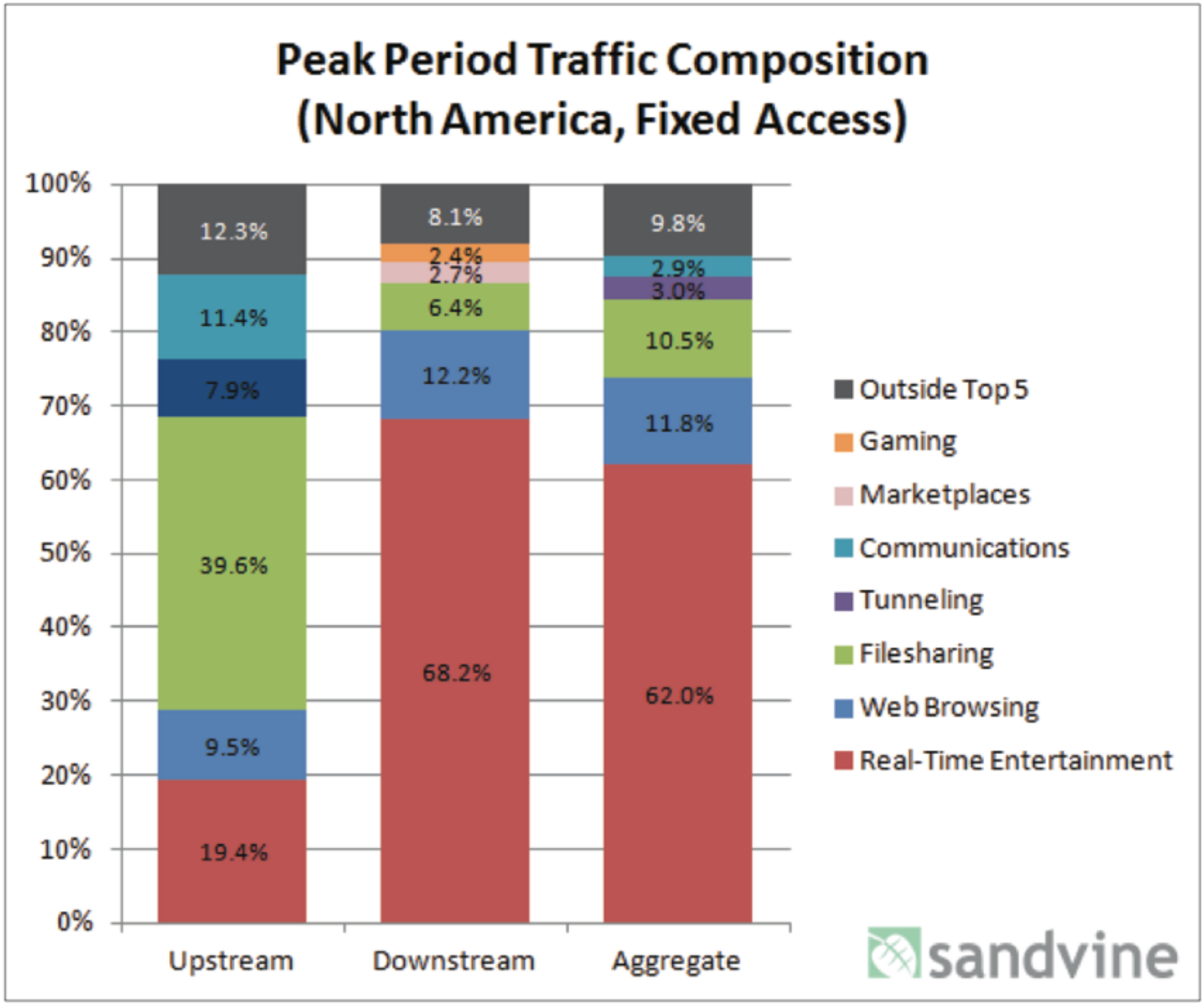
http://goo.gl/W6ltTG

http://goo.gl/flCVQP

http://goo.gl/x4boKD

Panorama de uso da Internet

Acesso fixo



Dados Q1/2013 - Sandvine

	Upstream		Downstream		Aggregate	
Rank	Application	Share	Application	Share	Application	Share
1	BitTorrent	34.81%	Netflix	32.25%	Netflix	28.88%
2	HTTP	7.53%	YouTube	17.11%	YouTube	15.43%
3	SSL	5.81%	HTTP	11.11%	HTTP	10.66%
4	Netflix	5.38%	BitTorrent	5.57%	BitTorrent	9.23%
5	Skype	4.88%	MPEG	2.58%	SSL	2.39%
6	YouTube	3.71%	Hulu	2.41%	MPEG	2.30%
7	Facebook	1.71%	iTunes	1.90%	Hulu	2.16%
8	Apple Photostream	1.34%	SSL	1.89%	iTunes	1.71%
9	Dropbox	1.21%	Flash Video	1.72%	Flash Video	1.53%
10	Carbonite	0.99%	Facebook	1.48%	Facebook	1.52%
Top 10		**67.38%**		**78.03%**		**75.82%**

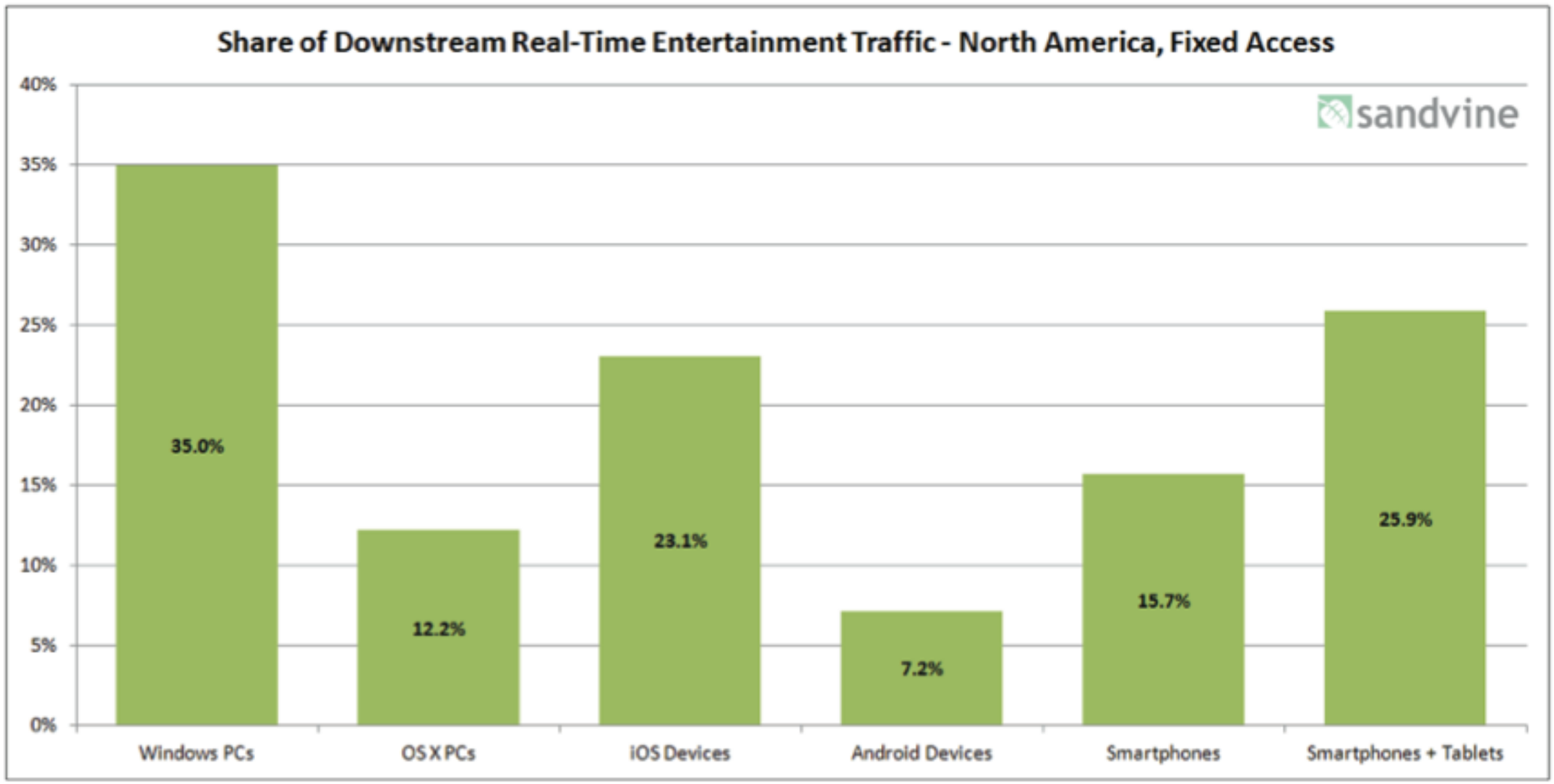
sandvine

Streaming de vídeo pelo Netflix corresponde à **1/3** do tráfego da Internet americana

Dados Q1/2013 - Sandvine

Home Roaming

20% of all downstream traffic on North American fixed access networks is viewed on a tablet or smartphone
- a 2X increase in just 1 year.



Dados Q1/2013 - Sandvine

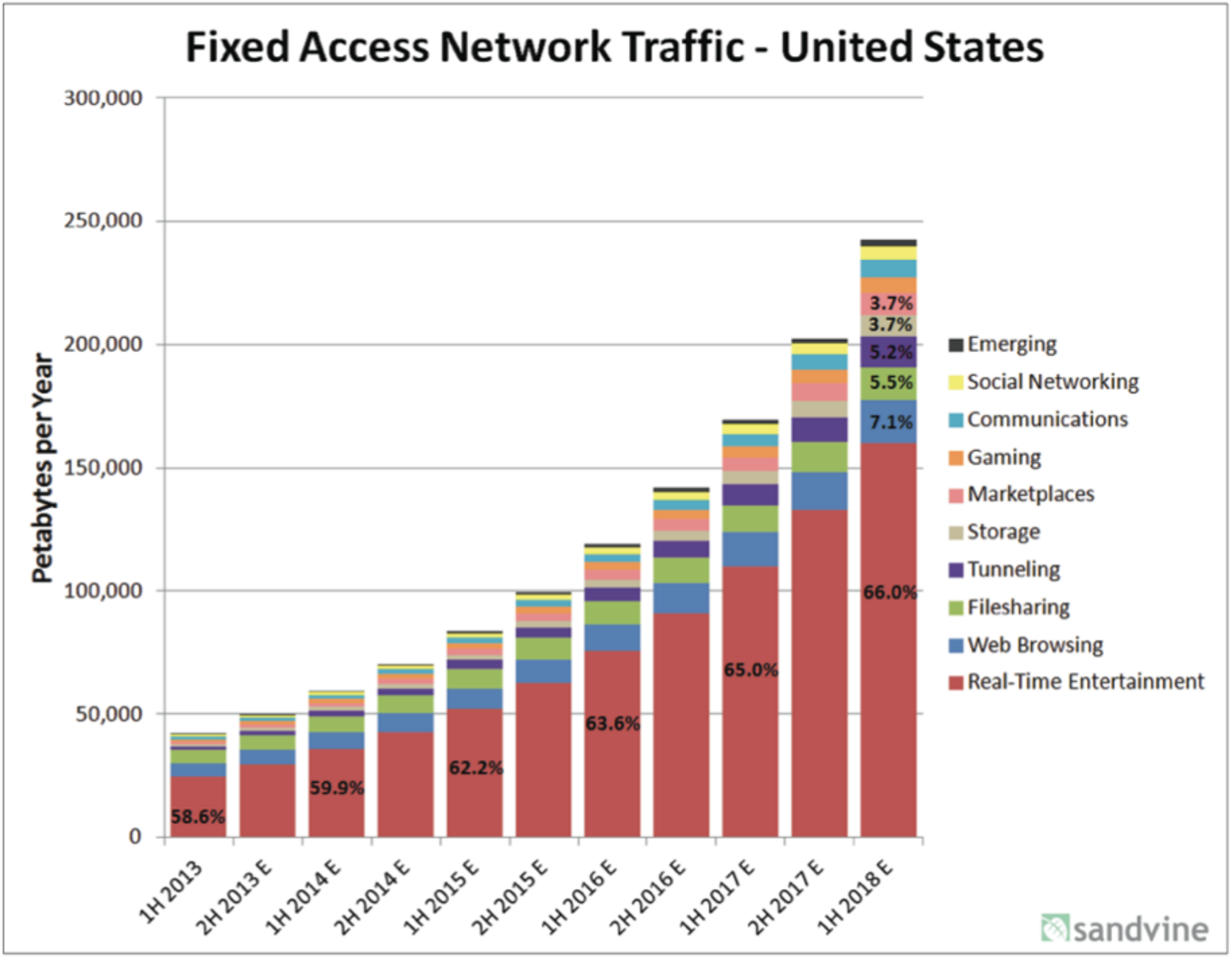
Top Device(s)

Device	Total	Distribution
PlayStation 3	1,660,790,717,096	30.57%
Xbox	1,354,787,788,866	24.94%
PC	1,062,191,313,929	19.55%
Wii	583,763,315,089	10.75%
Unknown	319,868,547,830	5.89%
Macintosh	127,676,683,410	2.35%
Roku	125,638,989,557	2.31%
Apple TV	43,197,961,523	0.80%
iPad	34,145,557,085	0.63%
Sony BluRay	33,286,268,071	0.61%
iPhone	29,104,060,266	0.54%
iPod	26,897,733,489	0.50%
TiVo	12,644,854,880	0.23%
Sony Digital TV	8,957,414,449	0.16%
iOS Device	8,823,078,203	0.16%

Units measured in bytes. sandvine

Fonte: Sandvine Global Internet Phenomena Spotlight - Netflix rising (2010)

Fixed Access Network Traffic - United States



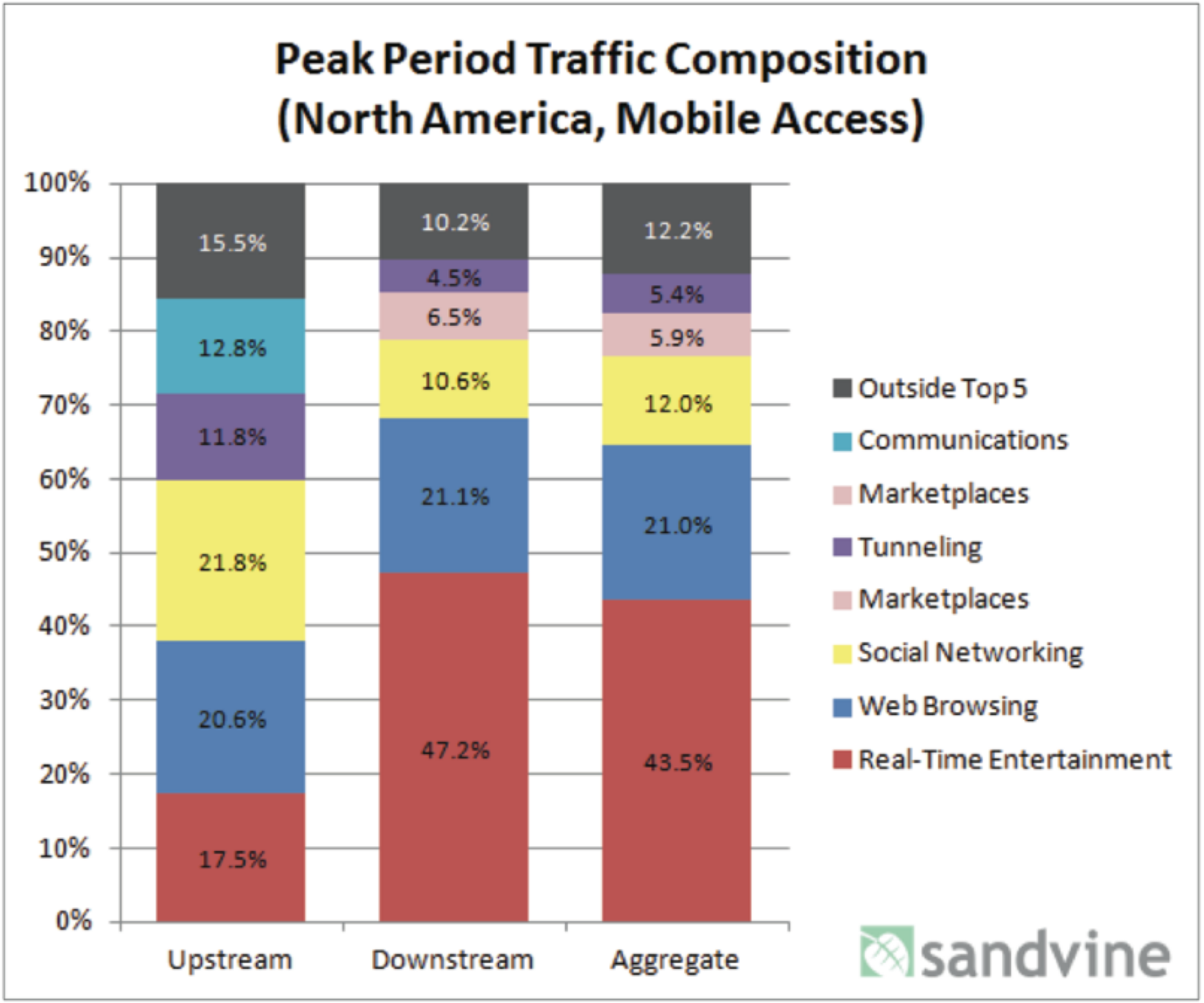
Dados Q1/2013 - Sandvine

Panorama de uso da Internet

Acesso móvel

Netflix is on the Move

After conquering North American fixed access networks, Netflix's share of downstream mobile traffic has almost doubled in the past year.

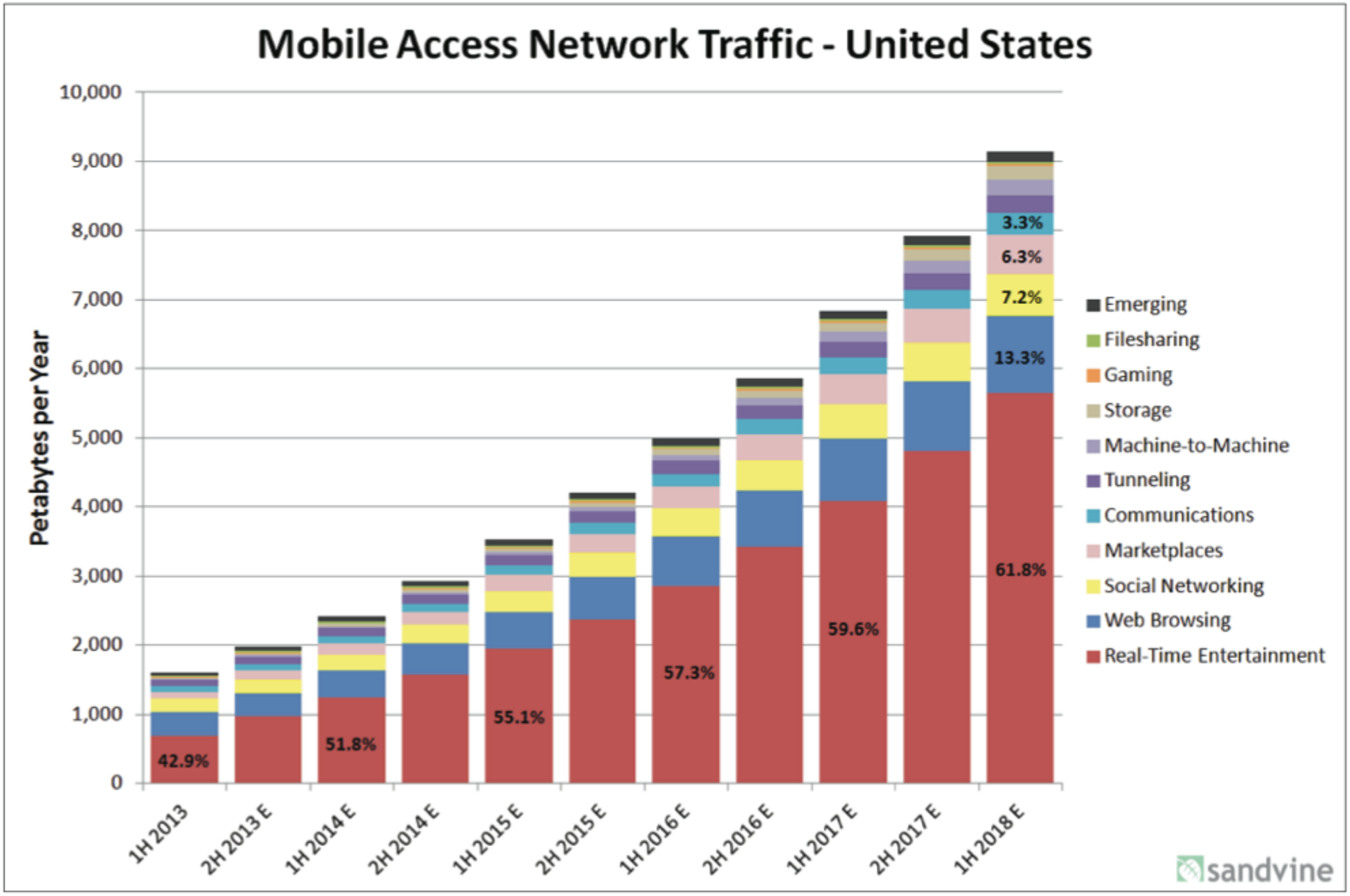


Dados Q1/2013 - Sandvine

	Upstream		Downstream		Aggregate	
Rank	Application	Share	Application	Share	Application	Share
1	Facebook	17.22%	YouTube	27.33%	YouTube	24.89%
2	HTTP	14.66%	HTTP	19.16%	HTTP	18.60%
3	SSL	9.78%	Facebook	8.67%	Facebook	9.71%
4	YouTube	7.36%	MPEG	7.32%	MPEG	6.61%
5	Netflix	2.76%	Google Play	4.37%	SSL	4.88%
6	Skype	2.70%	SSL	4.20%	Google Play	3.97%
7	BitTorrent	2.35%	Netflix	3.98%	Netflix	3.83%
8	BlackBerry	1.87%	Pandora Radio	3.35%	Pandora Radio	3.00%
9	MPEG	1.80%	BlackBerry	1.61%	BlackBerry	1.61%
10	Dropbox	1.52%	Flash Video	1.51%	Flash Video	1.37%
Top 10		**62.02%**		**81.50%**	Top 10	**78.48%**

sandvine

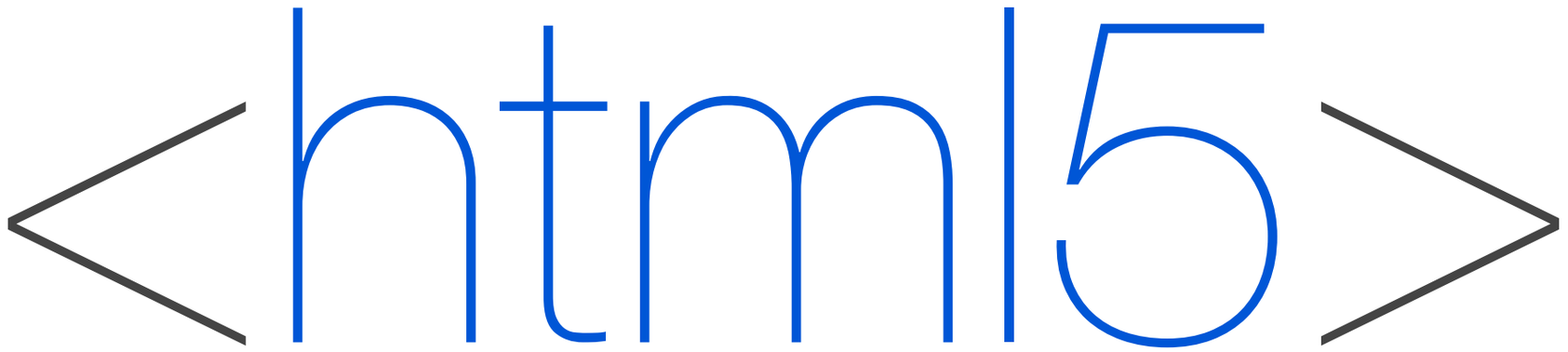
Dados Q1/2013 - Sandvine



Dados Q1/2013 - Sandvine

Traffic Category	Description	Examples
Administration	Applications and services used to administer the network	DNS, ICMP, NTP, SNMP
Communications	Applications, services and protocols that allow email, chat, voice, and video communications; information sharing (photos, status, etc) between users	Skype, WhatsApp, iMessage, FaceTime, MSN Messenger
Filesharing	Filesharing applications that use peer-to-peer or Newsgroups as a distribution models	BitTorrent, eDonkey, Gnutella, Ares, Newsgroups
Gaming	Console and PC gaming, console download traffic, game updates	Nintendo Wii, Xbox Live, Playstation 2, Playstation 3, PC games
Marketplaces	Marketplaces where subscribers can purchase and download media including applications, music, movies, books, and software updates	Google Android Marketplace, Apple iTunes, Windows Update
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 Video, MPEG), peercasting (PPStream, Octoshape), specific streaming sites and services (Netflix, Hulu, YouTube, Pandora)
Social Networking	Websites and services focused on enabling interaction (chat, communication) and information sharing (photos, status, etc.) between users	Facebook, Twitter, LinkedIn, Instagram, Google+
Storage	Large data transfers using the File Transfer Protocol (FTP). Services that provide file-hosting, network back-up, and one-click downloads	FTP, Rapidshare, Mozy, zShare, Carbonite, Dropbox, Backblaze, Apple Photostream
Tunneling	Protocols and services that allow remote access to network resources, mask application identity, or provide encapsulation	Remote Desktop, VNC, PC Anywhere, SSL, SSH,
Web Browsing	Web protocols and specific websites	HTTP, WAP browsing

Dados Q1/2013 - Sandvine


<html5>

browsers

Select up to three browsers and compare their test results in detail

	Chrome 26	Firefox 20	Internet Explorer 10	Safari 6.0
	468 13 bonus points	**394** 10 bonus points	**320** 6 bonus points	**378** 8 bonus points
Video	**30**	**21**	**30**	**30**
`video` element »	Yes ✔	Yes ✔	Yes ✔	Yes ✔
Subtitle support »	Yes ✔	No ✘	Yes ✔	Yes ✔
Poster image support »	Yes ✔	Yes ✔	Yes ✔	Yes ✔
MPEG-4 support »	No ✘	No ✘	No ✘	Yes ✔
H.264 support »	Yes ✔	No ✘	Yes ✔	Yes ✔
Ogg Theora support »	Yes ✔	Yes ✔	No ✘	No ✘
WebM support »	Yes ✔	Yes ✔	No ✘	No ✘

Fonte: html5test.com, maio/2013

GOOGLE CHROME

MATT BUCHANAN

1/11/11 4:53pm

24,986 376

Like 79

Google Chrome Drops H.264 Support, Even Though It Still Loves Flash

Oh wow. Google's dropping support for h.264 video in Chrome, because, they say, they're only going to support "open codec technologies":

> *To that end, we are changing Chrome's HTML5 support to make it consistent with the codecs already supported by the open Chromium project. Specifically, we are supporting the WebM (VP8) and Theora video codecs, and will consider adding support for other high-quality open codecs in the future. Though H.264 plays an important role in video, as our goal is to enable open innovation, support for the codec will be removed and our resources directed towards completely open codec technologies.*

er	Operating system	Latest stable release	Video formats supported		
			Theora	H.264	VP8 (WebM)
Android browser	Android	4.2.1 "Jelly Bean" (November 27, 2012; 5 months ago) [±][32][33]	2.3[34]	3.0[34]	2.3[34]
Chromium	All supported	N/A	r18297[35]	Manual install[note 1]	r47759[37]
Google Chrome	All supported	26.0.1410.67 (May 14, 2013; 2 days ago) [±][39]	3.0[40][41]	3.0[41][note 2]	6.0[43][44]
Internet Explorer	Windows	10.0.5 [46] (May 14, 2013; 2 days ago) [±]	Manual install[note 3]	9.0[48]	Manual install[note 4]
	Windows Phone	10.0 (November 21, 2012; 5 months ago) [±]	No	9.0[citation needed]	No
	Windows RT	10.0		10.0[citation needed]	
Konqueror	All supported	4.10.3 (7 May 2013; 9 days ago) [±][51]	4.4[note 5]		
Mozilla Firefox	Windows 7+	21.0 (May 14, 2013; 2 days ago) [±][53]	3.5[54]	21.0[note 6]	4.0[57][58]
	Windows Vista			22.0 (Beta)[59]	
	Android			17.0[60]	
	All other supported			No	
Opera	All supported	12.15 (April 4, 2013; 42 days ago) [±]	10.50[61]	No	10.60[62][63]
Safari	iOS	6.0.4 (April 16, 2013; 30 days ago) [±]	No	3.1[64][65]	No
	MacOS X		Manual install[note 7]		Manual install[66]
Web (previously Epiphany)	All supported	3.8.1 (April 18, 2013; 28 days ago) [±][67]	2.28[note 8]		

Fonte: wikipedia, maio/2013

```
<video poster="movie.jpg" controls>
        <source src="movie.webm" type='video/webm; codecs="vp8.0, vorbis"'/>
        <source src="movie.ogg" type='video/ogg; codecs="theora, vorbis"'/>
        <source src="movie.mp4" type='video/mp4; codecs="avc1.4D401E, mp4a.40.2"'/>
        <p>This is fallback content</p>
</video>
```

Fonte: wikipedia, maio/2013

Vídeo na Internet

Características de um vídeo digital

- Frames (fps)
- **Co**mpressor - **dec**ompressor (codec): H.264 MPEG-4 AVC, DV, HDV, WMV - compressão
- Container: combina imagem + vídeo + metadados (closed-captioning, chapter info, subtitles, etc) - formato do arquivo
  - MP4, QuickTime (MOV), ASF (WMV), Flash (FLV), 3GP, AVI

Compressão

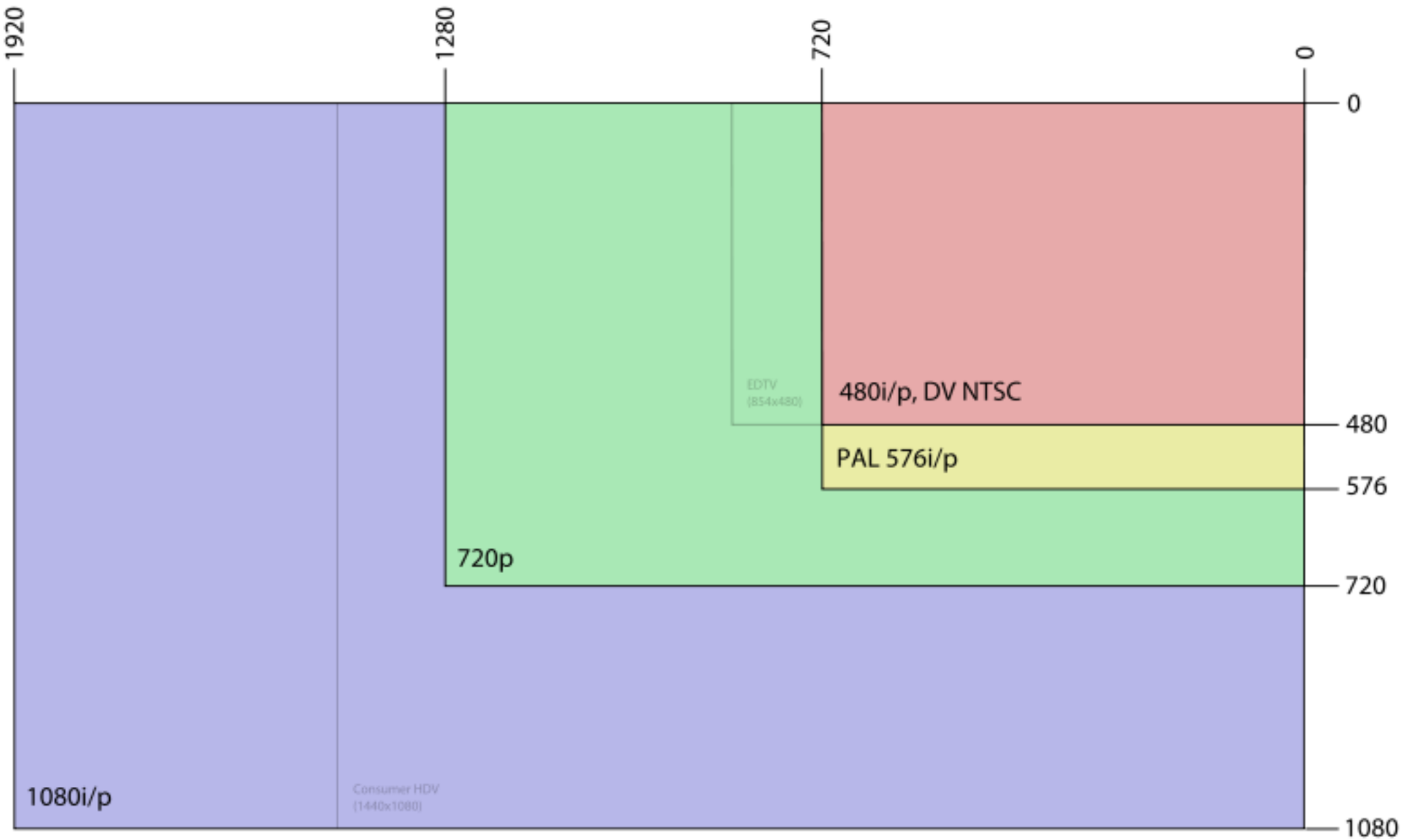
- Reduzir a quantidade de dados para representar as imagens do vídeo
- Compressão de imagens + compensação de movimento
- Evitar informações redundantes no arquivo de vídeo, atenuando os requisitos de armazenamento e banda
- Quando mais compressão, pior a qualidade

Data rate

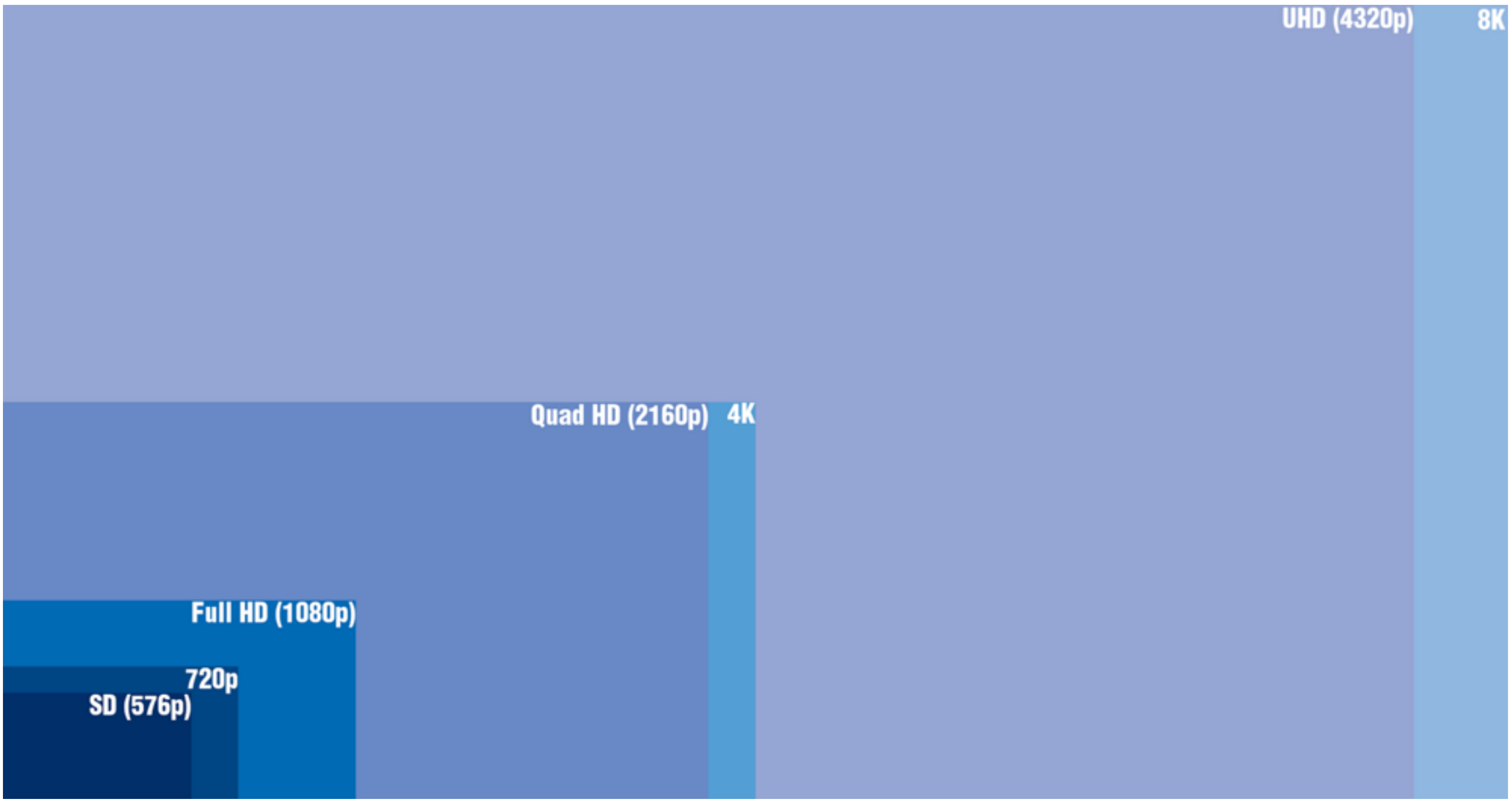
- Bit Rate
- Quantidade de dados que é transferida por segundo
- Descrita em Kilobits por segundo (kbps) ou Megabits por segundo (Mbps)
- Alto bit rate = menos compressão
- Maior qualidade do vídeo
- Baixo bit rate = mais compressão
- Menor qualidade do vídeo

Resolução

- Frame size = dimensão em pixels de um frame



Resolução - 4K & 8K

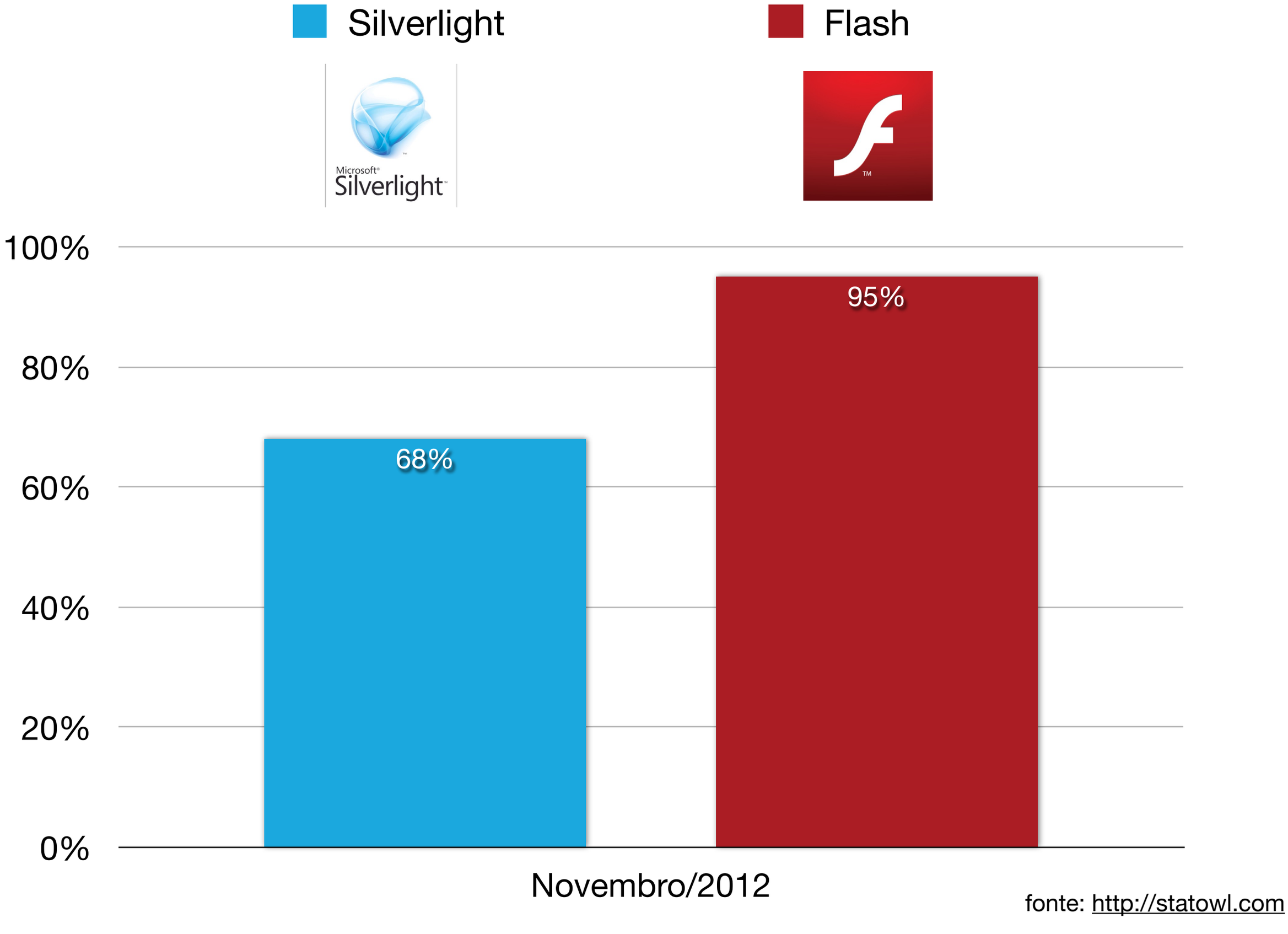


Aspect Ratio

- **4:3**
  - ex: 320x240, 480x360, 640x480
  - padrão
- **16:9**
  - ex: 320x180, 480x272, 640x360
  - wide
- **2.39:1 ou 1.85:1**
  - ex: 320x136, 480x204, 640x272
  - film


Microsoft®
Silverlight™


TM



fonte: http://statowl.com

Microsoft Silverlight

- 2005: Compra da Macromedia pela Adobe
- 2006: Perda de mercado de vídeos p/ Adobe Flash
- 2007: Silverlight 1.0 - NAB 2007 (março)
- 2008: Silverlight 2.0 (1.1) (outubro)
- Incluía o .NET framework 3.0
- NBC Olympics e MLB.com
- 2009: Silverlight 3.0 beta - MIX 2009 (março)
- Suporte AAC/H.264

http://www.nbcolympics.com - NBCOlympics.com - 2008 Beijing Summer Olympic Games | Free Online Videos, Olympic Event | Athlete Inte...

msn video

EXPLORE VIDEOS

Powered by Microsoft Silverlight

Transferring data from chunks-91.olympics.video.msn.com...

Adobe Flash

- Flash 6: suporte à vídeo
- Flash 7: Flash Lite / Flex
- Flash 8: On2 VP6 Codec, YouTube desponta
- Flash 9: Action Script 3, h.264, AAC, HD Video
- Flash 10: Dynamic Streaming, RTMFP

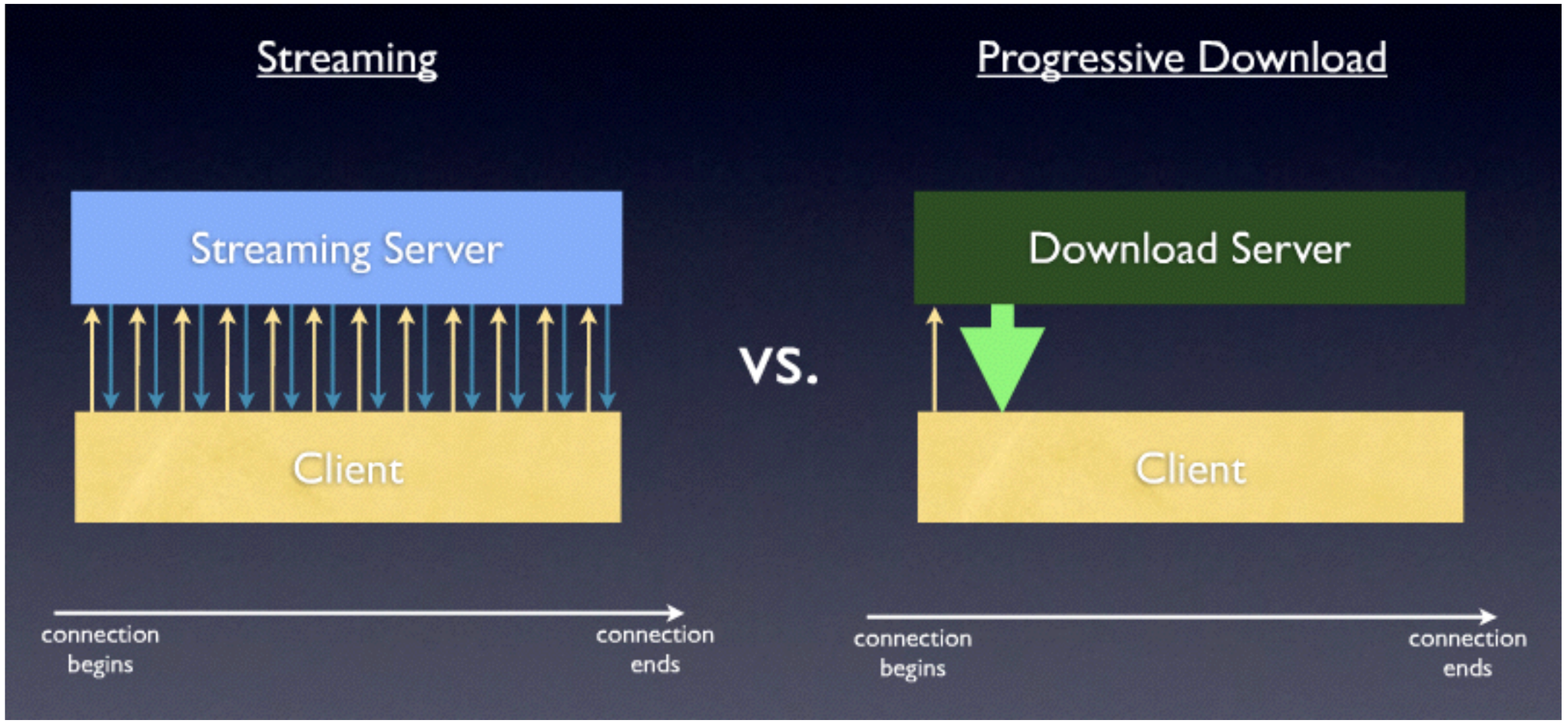
hulu

Cadeia de produção

- Infra básica:

- Usuários utilizam um player para assistir o conteúdo
- O conteúdo é requisitado pelo player e distribuído pelo server
- Os encoders geram o conteúdo que está hospedado no server e/ou que é transmitido ao vivo

Streaming v.s. Download



Progressive download

- Web server comum (Apache)
- Apenas vídeo sob demanda (VoD)
- Conteúdo pode ser comprimido em qualquer taxa
- Qualidade do conteúdo não depende da banda do usuário
- Video precisa ser completamente carregado para que se possa passar para o fim
- Cópia do conteúdo no HD (problemas com direitos)
- Métricas imprecisas

Streaming

- Streaming Server
- Live e sob demanda (VoD)
- Real-Time
- Conteúdo permanece apenas na memória RAM
- Podemos passar para qualquer ponto do vídeo
- Métricas fornecidas pelo servidor de streaming
- Qualidade do conteúdo depende da largura de banda disponível

Protocolos

- Empresas líderes no segmento operam com protocolos proprietários
- Adobe
  - RTMP, RTMPT, RTMPE, RTMPTE, HDS (HTTP)
- Microsoft
  - MMS, HTTP, RTSP
- Apple
  - QuickTime, HLS (HTTP)

Encoding

↓

Distribuição

↓

Consumo

Encoding

Codec
Bitrate
Framerate
Resolução
Aspect ratio
Ao vivo
VoD

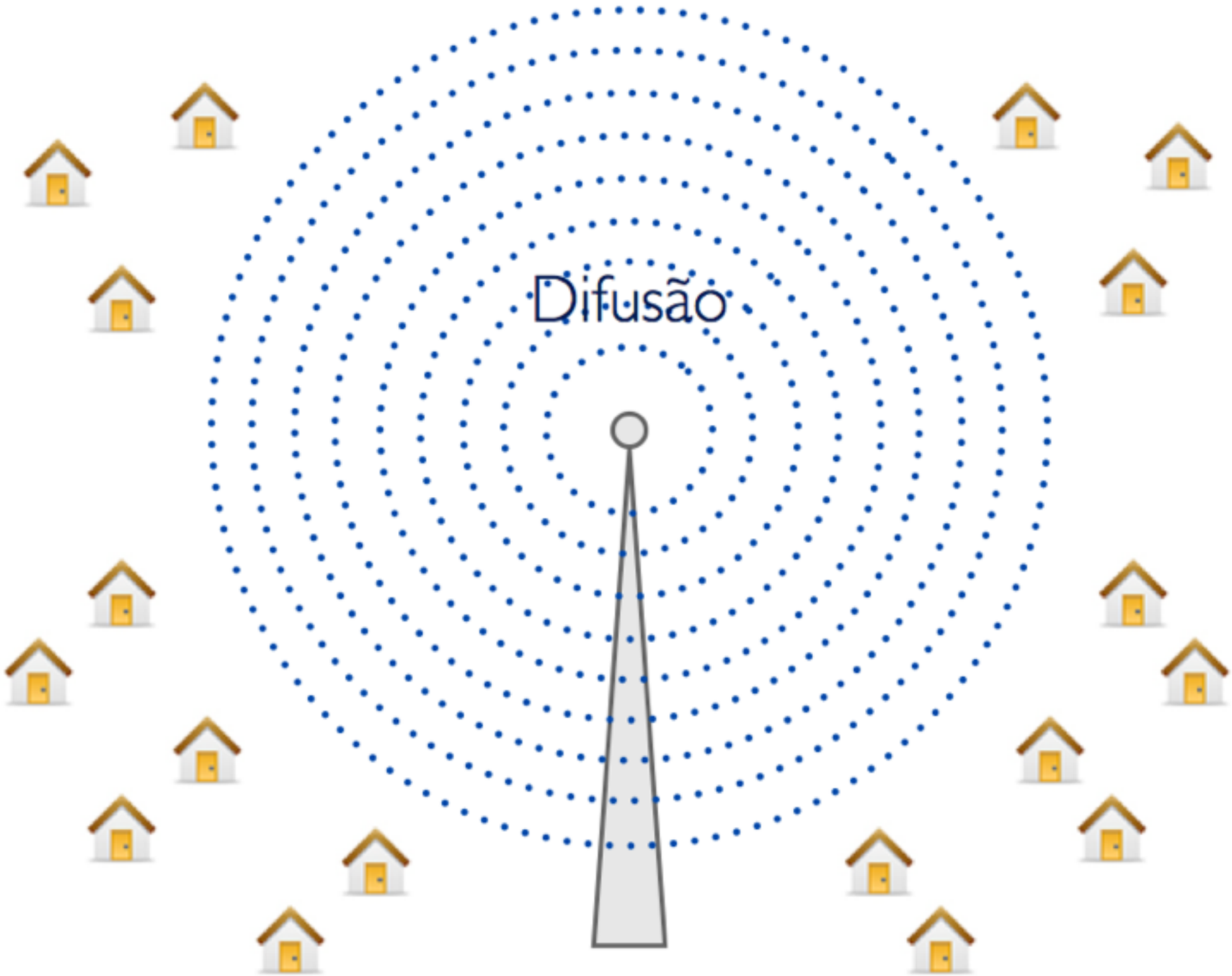
Distribuição

Servidor de Vídeo
Streaming
Download progressivo
Protocolo
CDN
DRM

Consumo

Player
UX
DVR
Flash
Silverlight
HTML5
DRM

Distribuição: TV vs. Internet



Distribuição: TV vs. Internet

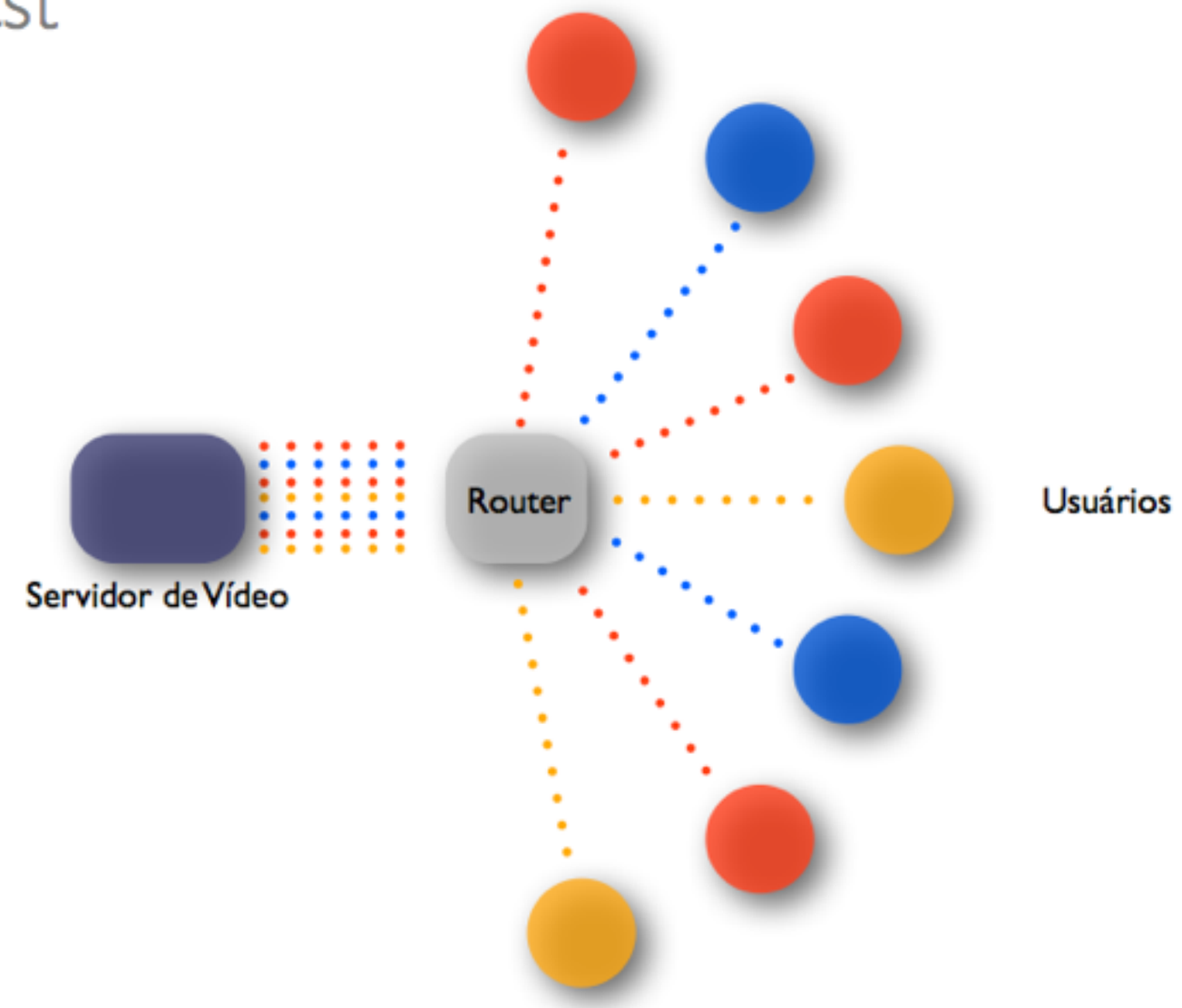
Unicast

Multicast

peer-2-peer

Distribuição: TV vs. Internet

Modelo Unicast



Maior Quantidade de Usuários - Maior Número de Conexões

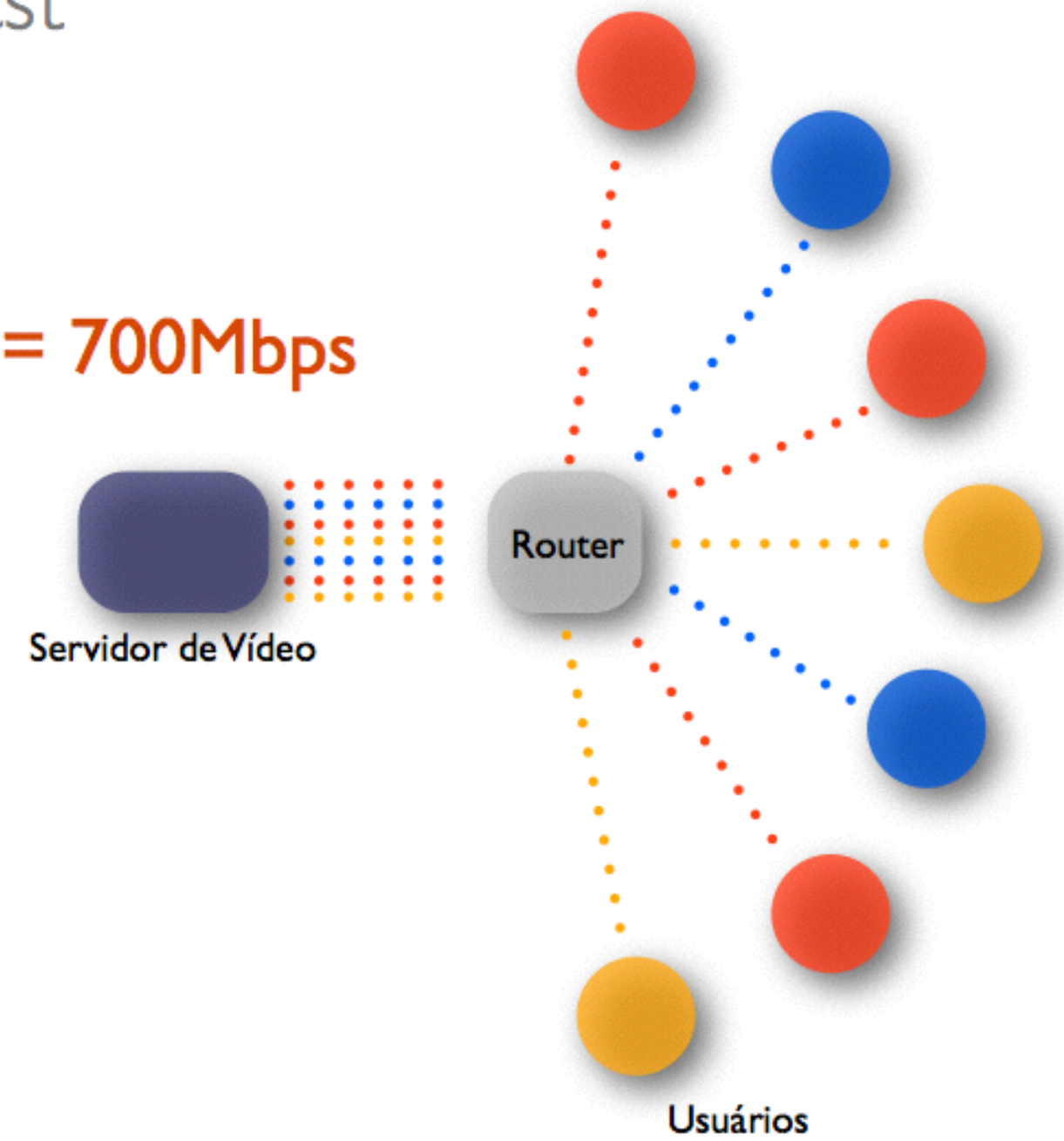
Distribuição: TV vs. Internet

Modelo Unicast

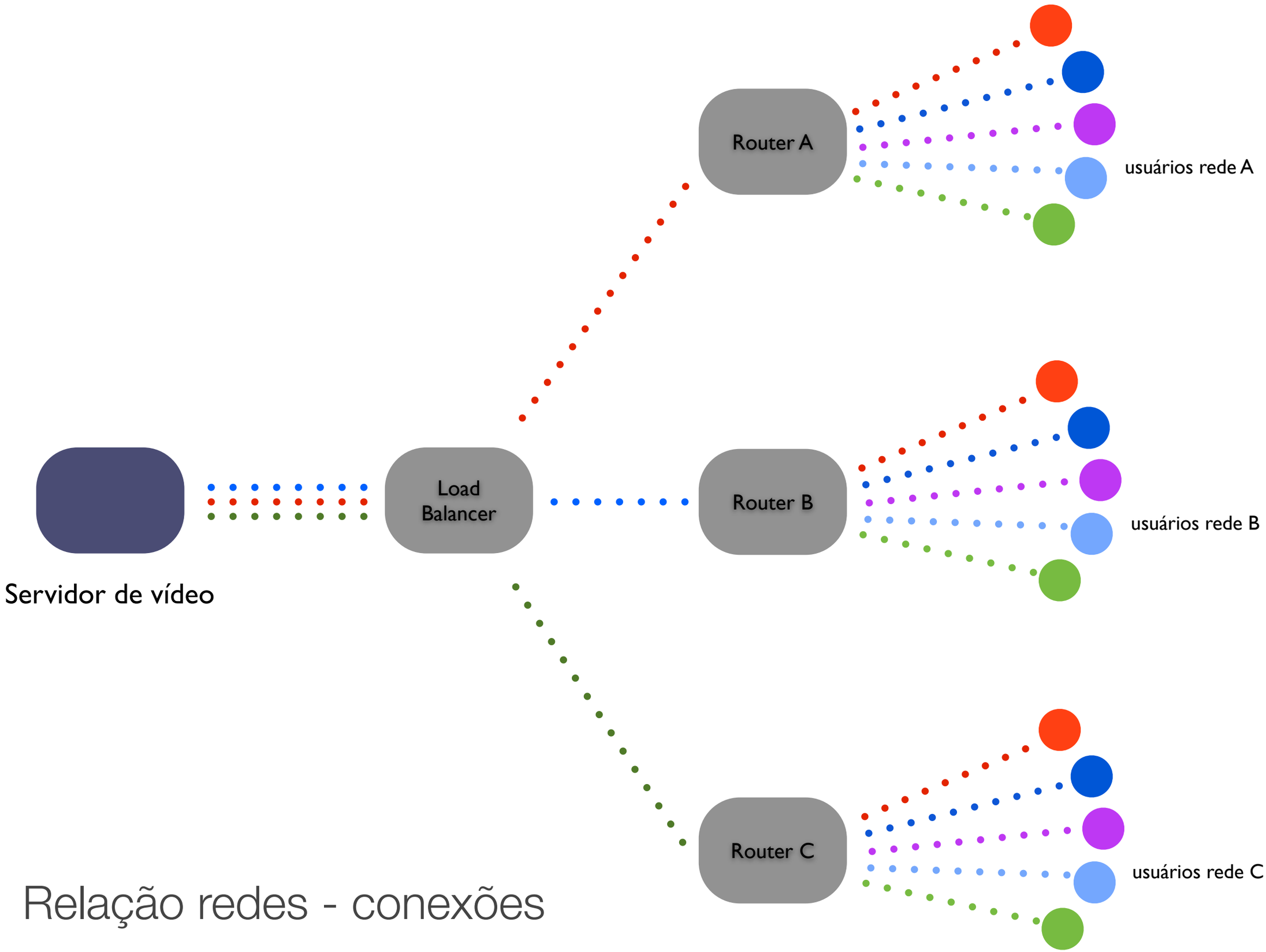
500kbps x 1400 = 700Mbps

Bottlenecks:

- Rede
- CPU
- Memória
- I.O.



Modelo Multicast



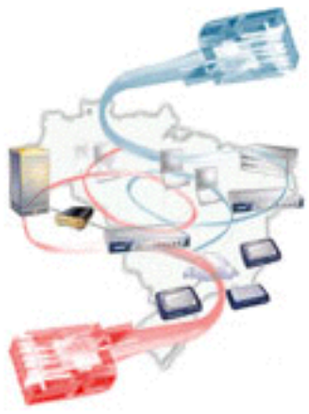
Relação redes - conexões

Modelo Multicast

Neutralidade de rede

Marco Civil: Neutralidade de rede é concorrência

:: Luís Osvaldo Grossmann
:: Convergência Digital :: **17/04/2013**



Ponto central do Marco Civil, a neutralidade de rede é uma tentativa de garantir a competição na Internet, de forma a preservar o caráter de incentivo a ideias inovadoras. Com essa leitura, o ex-conselheiro do Conselho Administrativo de Defesa Econômica, Olavo Chinaglia, defendeu que esse princípio seja mantido como previsto na proposta que estacionou no Plenário da Câmara dos Deputados.

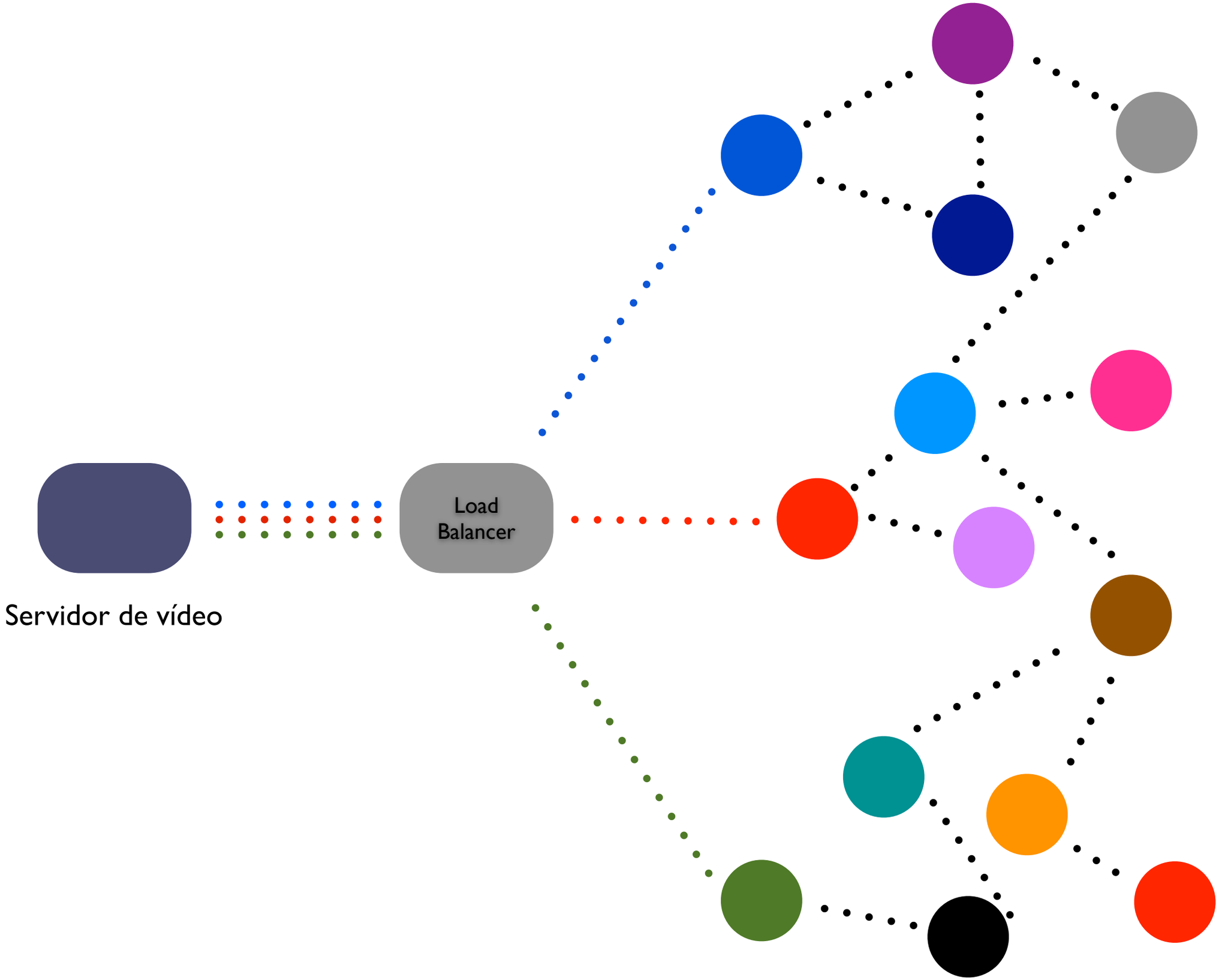
Distribuição: TV vs. Internet

Unicast

~~Multicast~~

peer-2-peer

Modelo peer-2-peer



Modelo peer-2-peer

Atualmente, existem diversas empresas que oferecem produtos de Streaming P2P.

- OctoShape
- Rawflow
- Abacast
- …

Diferenciais da OctoShape

- Clientes de streaming de vídeo

- Clientes de streaming de áudio

- Algoritmo mais eficiente
  - GridCast (maior eficiência na propagação do fluxo)
  - Particionamento do vídeo em fluxo menores (maior permeabilidade na utilização da banda de clientes)

Modelo peer-2-peer

Modelo peer-2-peer

tvover.net
IPTV · Internet TV · Video

SatCom2013 AFRICA | THE BROADCAST Show AFRICA 2013 | submarine NETWORKS WORLD

IPTV News | IPTV Service Providers | Internet TV | IPTV Events Calendar | IPTV Products | IPTV Jobs | IPTV Books

Contact | Advertise | About

Search Search

Search for Internet TV

Subscribe

Subscribe to our RSS feed

Bookmark TVover.net

Subscribe to our email newsletter

2278 readers BY FEEDBURNER

Octoshape Powered 2008 Olympic HD Coverage

During the Olympic Games 2008, Octoshape solutions were streaming Olympic coverage in HD (2.5 mbps) for several broadcasters in Asia, some in corporation with CDNetworks.

OCTOSHAPE

Using the powerful features of the Octoshape streaming protocol, multiple point failover, throughput optimization, and loss resilience made it possible to deliver HD quality to end users all over Asia.

Hundreds of Gbps were delivered and millions of hours consumed. The HD-quality distribution ensured a great user experience which in turn caused the average session duration to hit almost a full hour.

The unique Octoshape P2P-engine, or grid delivery system, also proved itself essential for webcasts of this magnitude. Saving as much as 95% of the bandwidth needed to power this high-quality webcast, meant that the Olympic spirit could reach almost an unlimited amount of users.

Octoshape's ongoing mission is to turn live streaming into a reliable business. Enabling HD-webcasts in massive scale at reasonable costs will benefit both viewers and broadcasters today and in the future of online media.

Posted on Oct 30, 2008
Filed in: Internet TV

Reviews | Share | Digg

Igor Macaúbas
igor@macaubas.com