



# European Peering Cultures

## Impact on network costs and end-user experience

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Bart van der Sloot  
Director Carrier Services  
Product Management  
Benelux and CEE

Paul Weterman  
Director  
Data Services & IP EMEA

PLNOG4, 4 March 2010, Warsaw

# Peering Cultures?



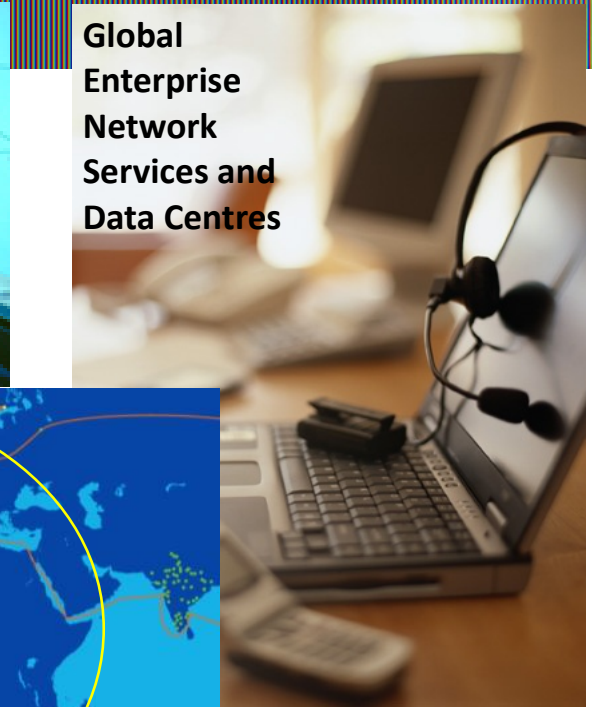
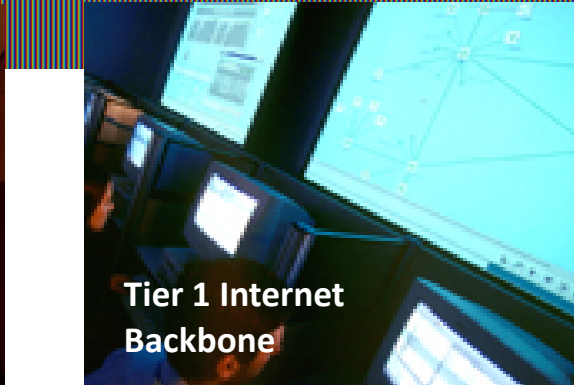
Islamabad (July 1), Representatives of PTCL and TWA are exchanging documents after signing agreement on Local Internet Peering at PTA Headquarters. Chairman PTA, Dr. Mohammed Yaseen, Member Finance, Syed Nasrul Karim Ghaznavi, Member Technical, Dr. Khawar Siddique Khokhar and other officials are also seen.



# Presentation Overview

- Global Crossing: who we are and what we do
- The importance of peering
- What shapes a peering culture
- Examples in France, Belgium, Spain and Netherlands
- Conclusions

# Global Crossing at a Glance



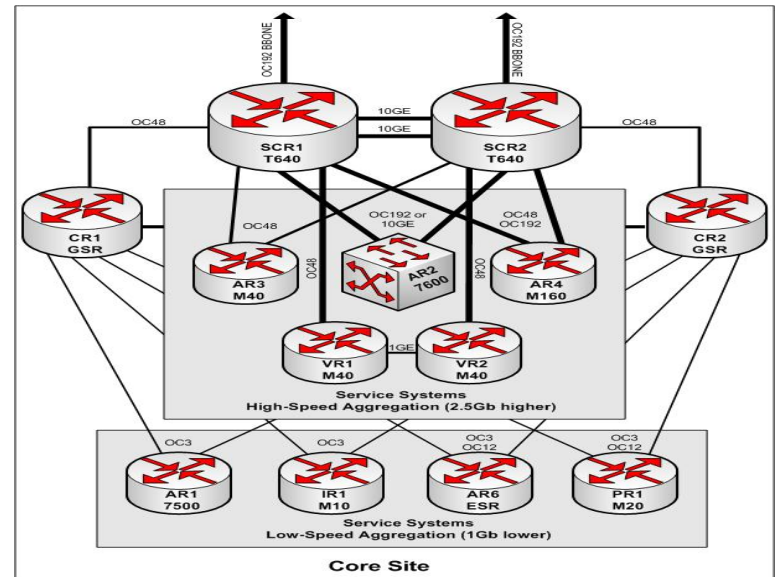
Unparalleled global sub-sea & terrestrial network  
Core Network self built / self operated / fully owned  
Team of over 5000 professionals in North America, Latin  
America and Europe



# Tier 1 Internet Backbone with extensive global private and public peering reaching 100% of the Internet

Direct connectivity into top Internet destinations

- Redundant and shortest path network design, minimizing latency and packet loss
- Over 3 Tbps peering capacity
- Strong focus on network security and keeping malicious traffic off the network
- First to deploy native IPv6 globally (2006)
- BGP Automation (RADB)
- One seamless global IP network (AS#3549) with end-to-end control
- Warsaw IP Node in PLIX-DC (LIM building)



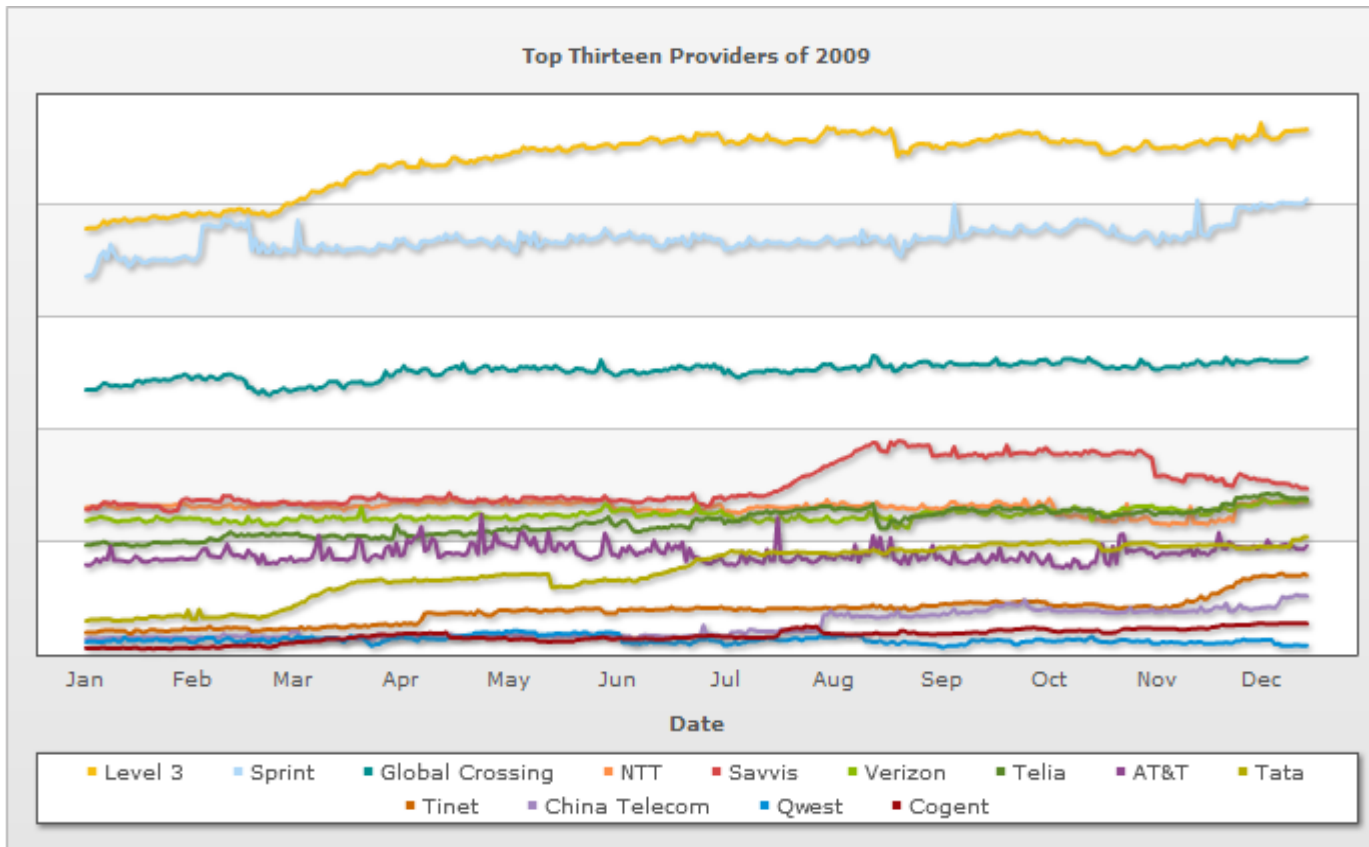
- Renesys reports Global Crossing as 3rd most connected backbone Tier 1 ISP, globally
- Knodes Index reports Global Crossing as 2nd fewest hop count \* Tier 1 ISP, globally

# Renesisys Ranking Global Customer Base

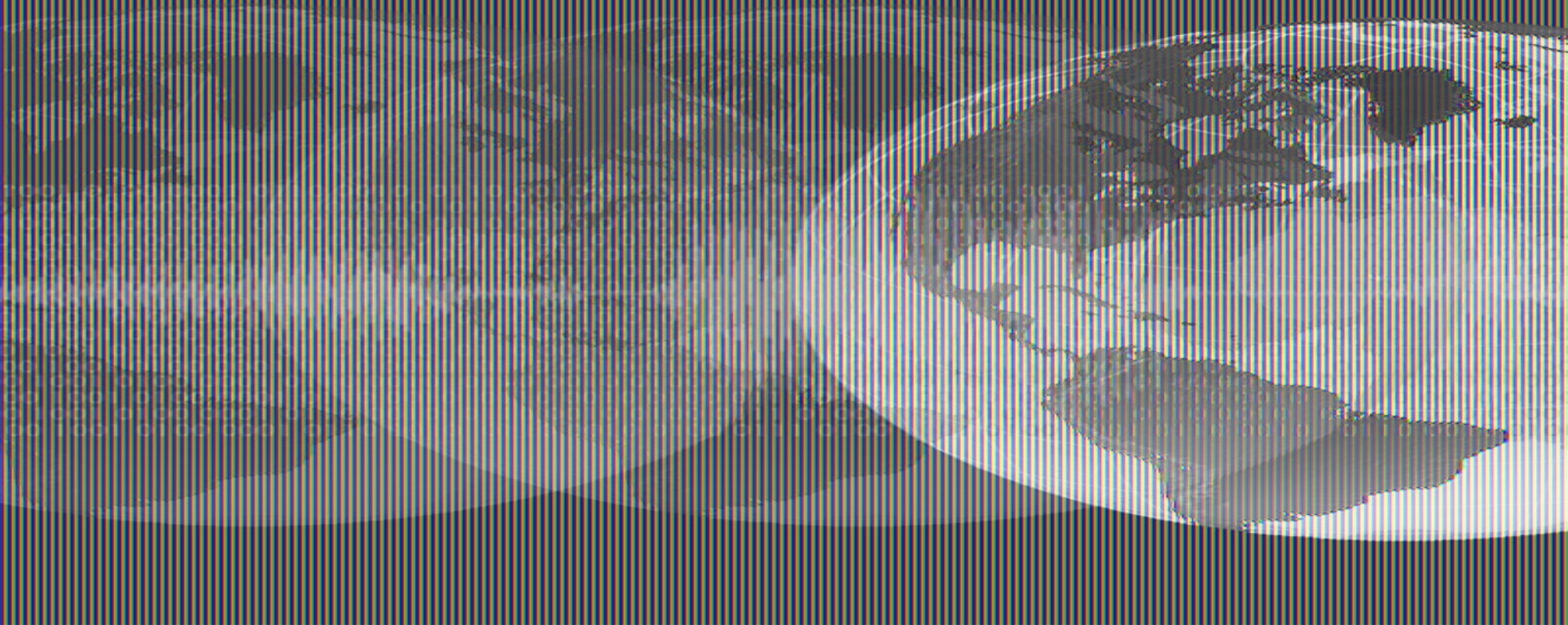
## Customer Base – Global

1	★ <a href="#">Level 3 Communications, LLC</a> <a href="#">AS 3356</a>	
2	☆ <a href="#">Sprint</a> <a href="#">AS 1239</a>	
3	★ <a href="#">Global Crossing</a> <a href="#">AS 3549</a>	
4	☆ <a href="#">MCI Communications Services, Inc. d/b/a Verizon Business</a> <a href="#">AS 701</a>	
5	☆ <a href="#">NTT Communications</a> <a href="#">AS 2914</a>	
6	★ <a href="#">TeliaNet Global Network</a> <a href="#">AS 1299</a>	
7	★ <a href="#">Savvis</a> <a href="#">AS 3561</a>	
8	★ <a href="#">Tata Communications</a> <a href="#">AS 6453</a>	
9	☆ <a href="#">AT&amp;T WorldNet Services</a> <a href="#">AS 7018</a>	
10	☆ <a href="#">China Telecom</a> <a href="#">AS 4134</a>	
11	★ <a href="#">Tinet SpA</a> <a href="#">AS 3257</a>	
12	★ <a href="#">Cogent Communications</a> <a href="#">AS 174</a>	

# Top 13 Providers of 2009



“The rankings are a rather crude measure of *size*, as they are based entirely on the quantity of IP space ultimately transited by each provider. However, it's the ranking *trends* that are more revealing than any absolute number” (source: Renesys 2009)

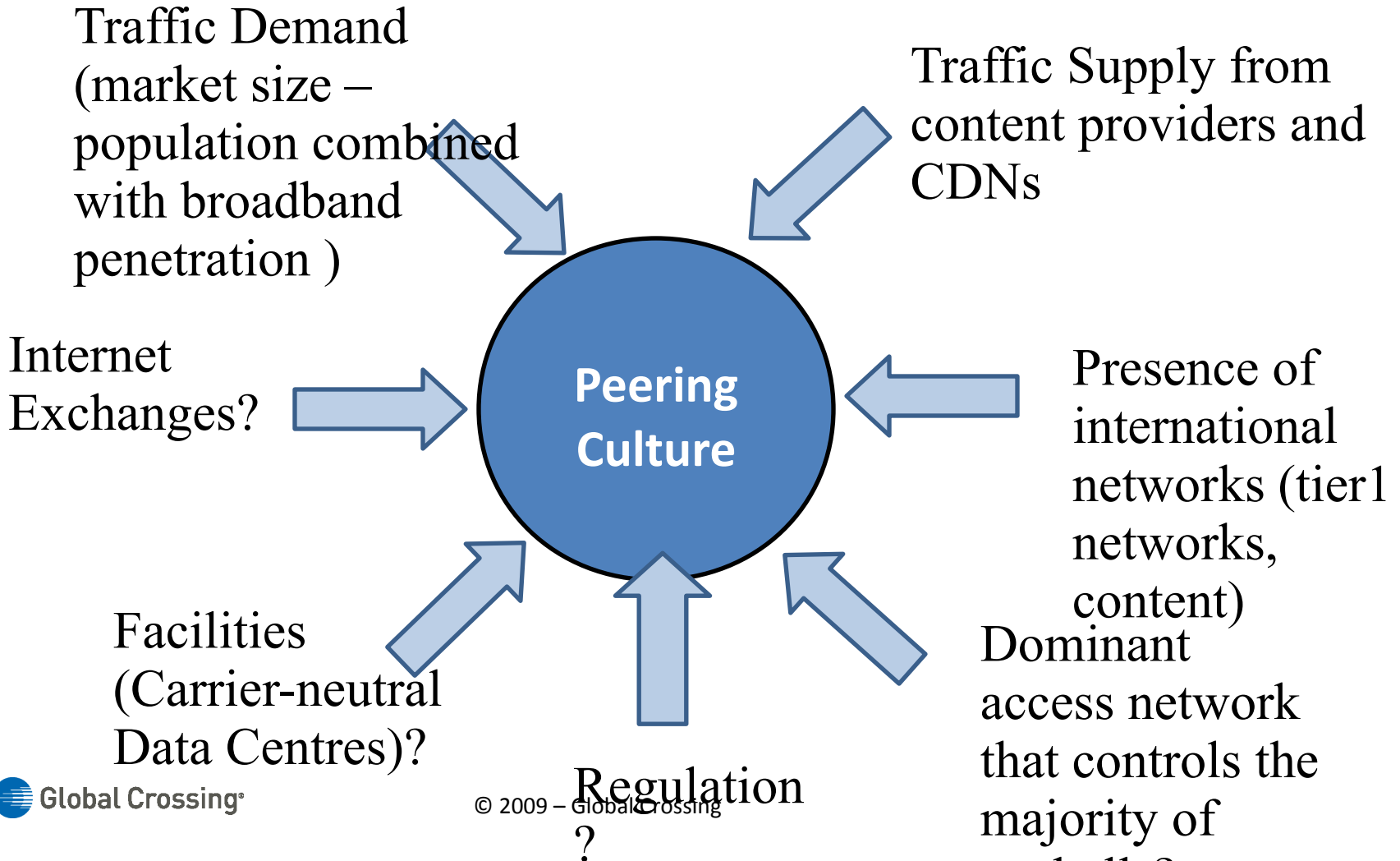


# Peering Cultures in Europe

The peering culture in a country impacts the profitability of an ISP and the “Internet experience”:

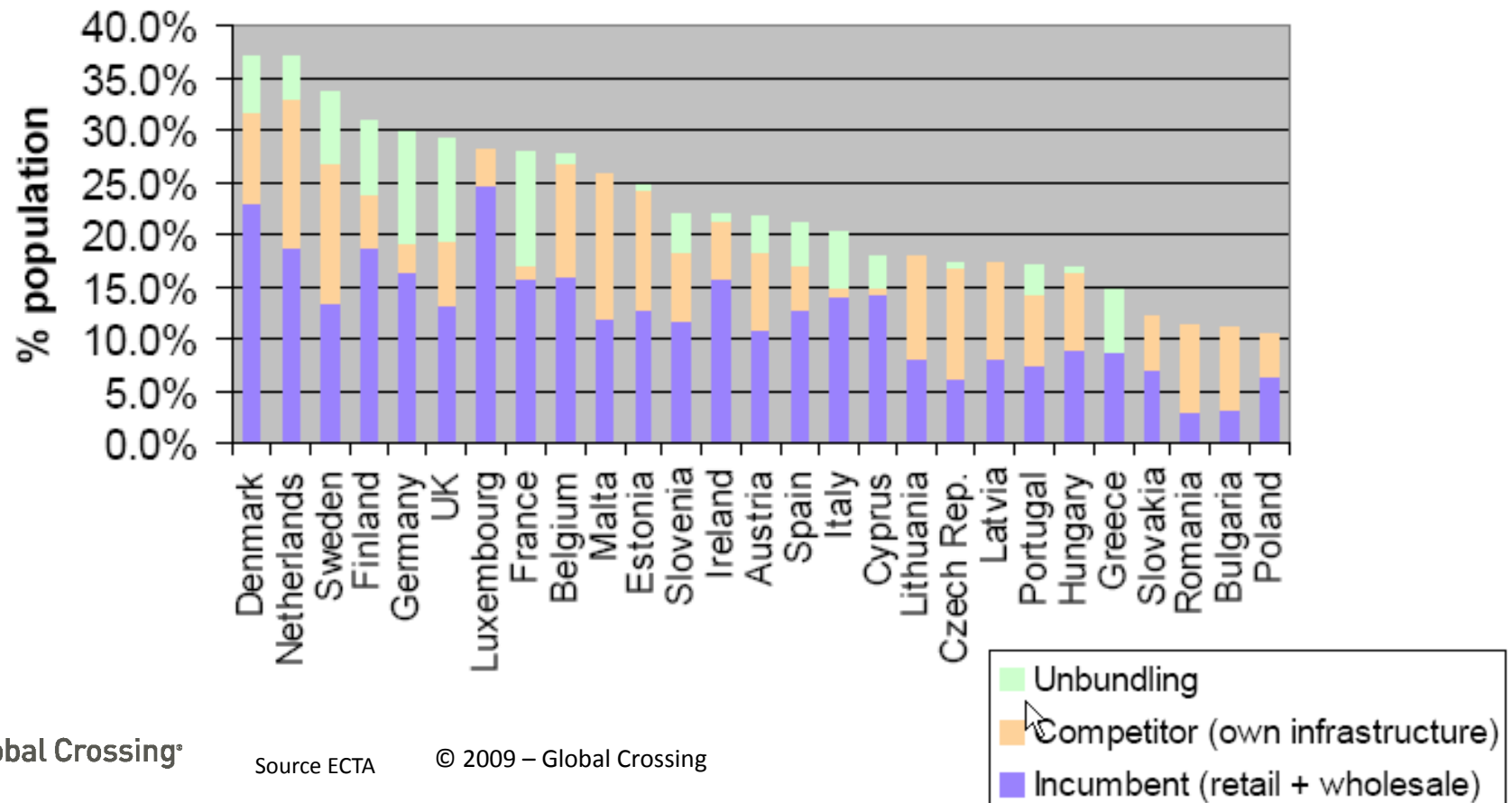
- An open policy **reduces costs** for both the content and the access network
- Typically results in sufficient bandwidth between networks, **improving the quality for the end-user**
- Restricted or paid peering either increases latency (or hop count) and/or **increases costs**
- Typically results in bottlenecks between networks and **lower quality for the end-user** (especially with e.g. streaming video)

# What shapes a peering culture?

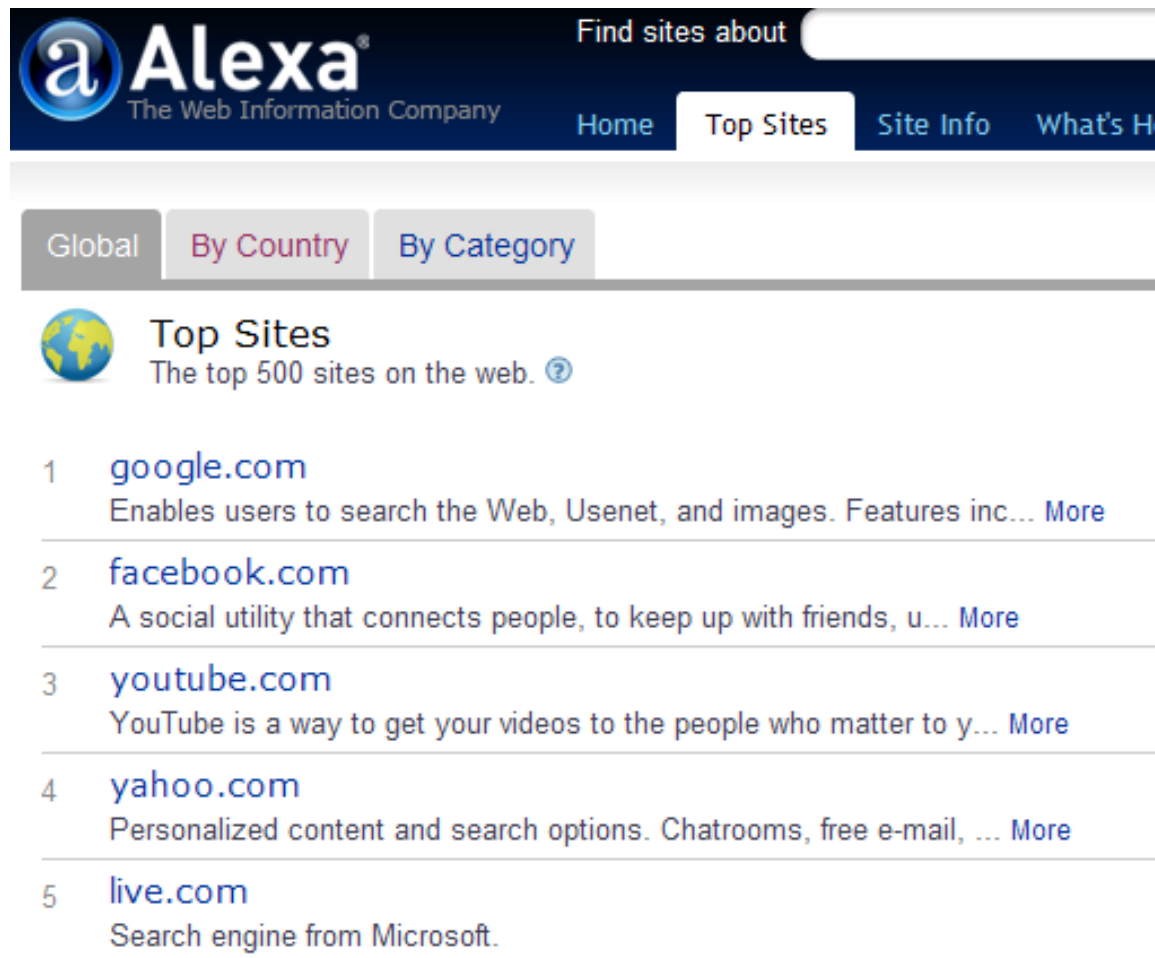


# Broadband penetration by Incumbent, LLU and CLEC

Penetration and competition



# TOP 5 content sites worldwide




The screenshot shows the Alexa website interface. At the top, there is a dark blue header with the Alexa logo (a stylized 'a' in a blue circle) and the text 'Alexa The Web Information Company'. To the right of the logo is a search bar with the text 'Find sites about' and a white input field. Below the header are navigation tabs: 'Home', 'Top Sites' (which is highlighted), 'Site Info', and 'What's Hot'. Below the navigation tabs are three filter buttons: 'Global', 'By Country', and 'By Category'. Below the filters is a section titled 'Top Sites' with a globe icon and the subtitle 'The top 500 sites on the web. ?'. Below this section is a list of the top 5 sites, each with a rank number, the site name, a brief description, and a 'More' link.

Find sites about

Home Top Sites Site Info What's Hot

Global By Country By Category

 **Top Sites**  
The top 500 sites on the web. ?

- 1 [google.com](http://google.com)  
Enables users to search the Web, Usenet, and images. Features inc... [More](#)
- 2 [facebook.com](http://facebook.com)  
A social utility that connects people, to keep up with friends, u... [More](#)
- 3 [youtube.com](http://youtube.com)  
YouTube is a way to get your videos to the people who matter to y... [More](#)
- 4 [yahoo.com](http://yahoo.com)  
Personalized content and search options. Chatrooms, free e-mail, ... [More](#)
- 5 [live.com](http://live.com)  
Search engine from Microsoft.

# Supply side: content providers and CDNs

- Local content providers: open peering policy
- Global content providers:
  - » Yahoo, Facebook, Microsoft: open
  - » Google/YouTube: selective
- Global CDN's:
  - » Akamai, Edgecast: open
  - » Limelight: selective

# Global content provider policies

## Yahoo! AS 10310

- Open peering policy
- Presence in 12 countries in main cities

The image shows the classic Yahoo! logo in red, serif font with an exclamation point.

## Google AS15169

- Selective peering policy, interconnects in multiple locations, international
- Presence in over 20 countries
- In-country regional presence in Germany, Russia, France, Italy

The image shows the multi-colored Google logo in its standard sans-serif font.

# The role of the incumbents

The incumbent dilemma:

All these content guys get a free ride on my network!



Continuous investment in more speed and capacity

or declining revenues per end-user

...results in different peering behaviors:

- open policy for regional/in-country networks (e.g. KPN, BT)
- paid peering policy (e.g. Deutsche Telekom)
- (very) restrictive policy for in-country networks (e.g. Telefonica, FT)

# Dominance of the Incumbent

## Germany

## France

Customer Base: Retail		?
1	☆ Deutsche Telekom AG AS 3320	
2	☆ International IP-Backbone of Vodafone AS 3209	
3	★ TeliaNet Global Network AS 1299	
4	+1 ☆ DFN-IP service X-WiN AS 680	
5	+2 ☆ Telefonica Deutschland AS 6805	
6	-2 ☆ Kabel Deutschland Breitband Service GmbH AS 31334	
7	-1 ★ Level 3 Communications, LLC AS 3356	
8	☆ Versatel West GmbH AS 8881	
9	+1 ☆ Verizon Business EMEA - Commercial IP service provider in ... AS 702	
10	-1 ☆ European Backbone of LambdaNet AS 13237	

Customer Base: Retail		?
1	☆ France Telecom - Orange AS 3215	
2	☆ NEUF CEGETEL (formerly LDCOM NETWORKS) AS 15557	
3	☆ Free SAS AS 12322	
4	☆ NUMERICABLE AS 21502	
5	+1 ☆ NUMERICABLE AS 6678	
6	-1 ☆ Reseau National de telecommunications pour la Technologie AS 2200	
7	+2 ☆ Bouygues Telecom ISP AS 5410	
8	☆ Completel Autonomous System in France AS 12670	
9	-2 ☆ CEGETEL ENTREPRISES AS 8228	
10	★ Cogent Communications AS 174	

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# Competition

## Belgium

## United Kingdom

Customer Base: Retail				?
1	+1	☆ Belgacom regional	AS 5432	
2	-1	☆ AS Object for Brutele SC	AS 12392	
3		☆ Telenet Operaties N.V.	AS 6848	
4		☆ Scarlet Belgium	AS 3304	
5		☆ T2 Belgium NV	AS 47377	
6		☆ Verizon Business EMEA - Commercial IP service provider in ...	AS 702	
7		★ Global Crossing	AS 3549	
8		☆ The Procter & Gamble Company	AS 11003	
9		☆ BELNET, The Belgian National Research and Education Network	AS 2611	
10		☆ be.mobistar	AS 12493	

Customer Base: Retail				?
1		☆ NTL Group Limited	AS 5089	
2	+1	★ Level 3 Communications, LLC	AS 3356	
3	+2	☆ Tiscali UK	AS 9105	
4	-2	☆ BTnet UK Regional network	AS 2856	
5	+1	★ Abovenet Communications, Inc	AS 6461	
6	+2	☆ Easynet Global Services	AS 4589	
7		☆ Avatar Broadband Limited	AS 35228	
8	+1	☆ The JANET IP Service	AS 786	
9	+2	☆ Cable and Wireless plc	AS 1273	
10		☆ Flag Telecom Global Internet	AS 15412	

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# The In-betweens

## The Netherlands

Customer Base: Retail				?
1	★	KPN AS 286		
2	☆	KPN Internet Solutions AS 8737		
3	☆	SURFnet, The Netherlands AS 1103		
4	+2	☆ Ziggo - tv, internet, telefoon AS 9143		
5		☆ Flag Telecom Global Internet AS 15412		
6	-2	★ Savvis AS 3561		
7	+1	☆ Verizon Business EMEA - Commercial IP service provider in ... AS 702		
8	-1	☆ UPC Broadband AS 6830		
9	+1	☆ Open Peering BV trading as Joint Transit AS 24785		
10	-1	★ Abovenet Communications, Inc AS 6461		

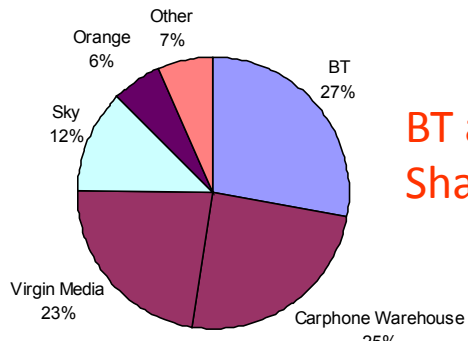
## Poland

Customer Base: Retail				?
1	☆	Polish Telecom's commercial IP network AS 5617		
2	☆	Netia SA AS 12741		
3	☆	GTS Polska Sp. z o.o. AS 8246		
4	+1	☆ Telekomunikacja Kolejowa Sp. z o.o. AS 20960		
5	-1	☆ UPC Polska Sp. z o.o. AS 9141		
6		☆ EXATEL S.A. AS 20804		
7	+4	☆ DIALOG-NET Autonomuos System AS 15857		
8	-1	☆ Multimedia Polska Sp.z o.o. AS 21021		
9	+4	☆ Crowley Data Poland, sp. z o.o. AS 12968		
10	-1	☆ Vectra Technologie S.A. AS 29314		

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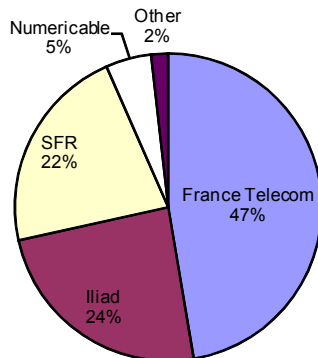
# Broadband competition

## The most competitive: UK



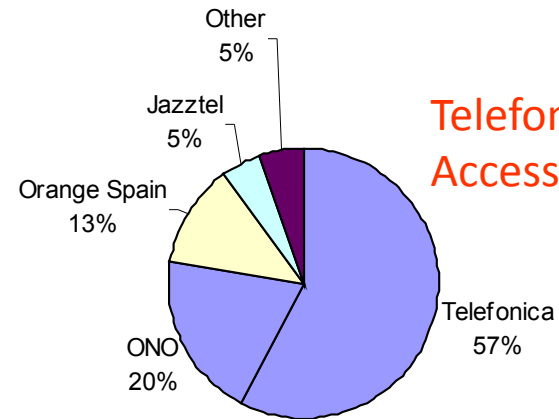
**BT access  
Share 77%**

## The stalemate: France



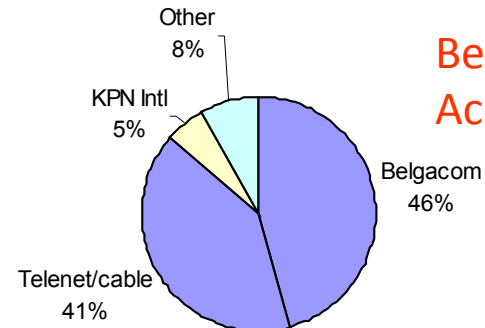
**FT  
Access share 95%**

## The incumbent squeeze: Spain



**Telefonica  
Access share 80%**

## The duopoly: Belgium



**Belgacom  
Access share 59%**

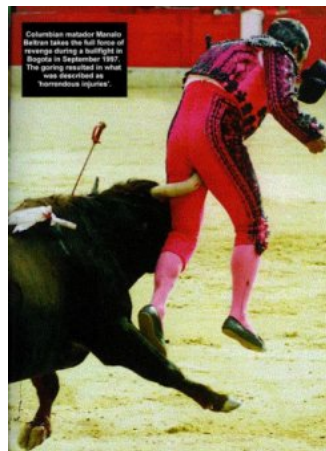
# Incumbent vs Challenger peering ratio



KPN; 79%  
Ziggo; 52%



Belgacom; 69%  
Telenet; 4%

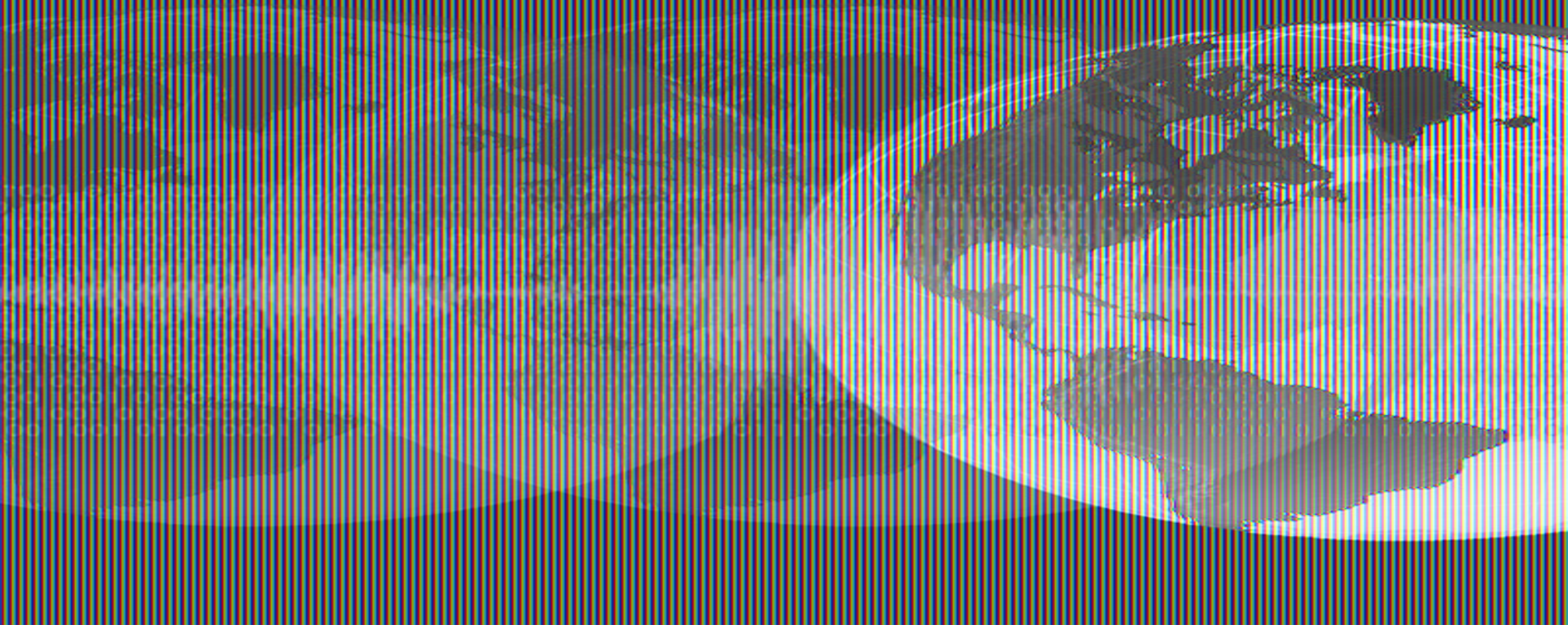


Telefonica; 62%  
Jazztel; 25%

# The role of the Internet Exchanges

	Amount of Internet eXchanges	Total amount of Participants	Main City	Telehouses in main hub	Main Internet eXchange	Members	traffic in main IX [Gbps]	Incumbent peering policy
Belgium	2	74	Brussels	9	bnix	41	15	open
France	15	437	Paris	14	panap	144	51	restrictive
Germany	14	921	Frankfurt	21	decix	497	651	paid
Netherlands	5	683	Amsterdam	24	amsix	495	636	open
Poland	4	45	Warsaw	2	plix	30	50	restrictive
Spain	5	62	Madrid	6	espanix	43	100	restrictive
United Kingdom	15	1034	London	25	linx	475	363	open

- 3 main IX's with many international participants: Ams-IX, De-CIX, Linx.
- Other IX's serve primarily domestic traffic.
- Large countries have regional IX's, typically for regional traffic only.



# France



Broadband market share France Telecom 48%, Free 24%, SFR, 23%, Numericable 18%.

- Competitive triple play offerings of 30 Mbits + TV + unlimited fixed destinations.
- ISP and web hosting market s very competitive.
- More and more French content , although the main social networks and video platform all remain US Sites.
- Incumbent France telecom with restrictive peering. Most ISPs complain about this.
- ISP s want to charge content providers due to the large bandwidth they consume. This is why Google wants to open a peering point in France.

3 main IX's: Sfinx, Panap, Freeix have not reached their goal of neutrality and connectivity.

As a result, Equinix launched his own peering offer in their locations in Paris

- Google+Akamai+Neo Telecom+Jaguar Network are preparing the opening of large

# Competitive offer in France

The screenshot displays the Free.fr website interface. At the top left is the 'free' logo. A navigation bar includes links for 'Portail', 'Freebox', 'Pas de ligne', 'Webmail', 'Pages perso', and 'mon compte'. Below this is a secondary menu with 'Accueil', 'Internet', 'Téléphone', 'Télévision', 'Boutique', and 'Assistance'. The main promotional banner features the text 'Internet + Téléphone + Télévision pour 29,99 €/mois\*'. On the left side of the banner, there are three buttons: 'Votre numéro' (with a sub-link 'Si vous représentez une collectivité Cliquez ici'), 'TESTEZ VOTRE LIGNE', and 'OUVRIR UNE LIGNE'. Below these is the text 'Pas de ligne' and 'Par téléphone 1044'. The right side of the banner features an image of a Freebox device with two callout boxes: 'Freebox en 120 sec' (with a play button icon) and 'Freebox en détail' (with a magnifying glass icon over the HDMI port).

# Belgium

Broadband market is dominated by Belgacom 46% and Telenet 41%

- Belgacom and Telenet do not have an open peering cultures for domestic access networks or hosting providers and are said to be very un-responsive.
- Like most (or all) countries peering is not regulated.
- The hosting market in Belgium is very small (in terms of traffic volumes).

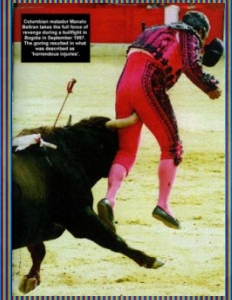


## Snel Internet

Meest verkocht

INTERNET THUIS	BasicNet	ComfortNet	ExpressNet	TurboNet
	Goedkoop internet voor starters	Comfortabel internet voor wie regelmatig surft & mailt	Supersnel internet voor het hele gezin	Topsnelheid voor de veeleisende surfer
Prijs	€ 20,00 per maand	€ 30,64 per maand	€ 42,91 per maand	€ 61,32 per maand
Download	1 Mbps	6 Mbps	15 Mbps	25 Mbps
Upload	128 Kbps	256 Kbps	1 Mbps	1,25 Mbps
Volume	1 GB	4 GB	25 GB	60 GB
Activeringskost: €50	<b>Online deal: 20 euro korting op je activeringskost €50 €30 voor nieuwe internet klanten</b>			
Installatie	<b>Promo: Draadloze internetinstallatie aan €149 €1 voor nieuwe internet klanten</b>			

# Spain



Broadband penetration in Spain is around 21%

- Dominated by Telefonica, Ono, Orange and Jazztel
- Telefonica has a restrictive peering strategy and charge high rates for peering.

## Unbundling

- The perception of Telefonica service in the residential market is positive. Telefónica seems to be the more resilient but it has to do as well with the dominance on the loop/last mile.
- Alternative carriers have suffered over the years the poor operational performance of Telefonica towards unbundling the loop (...lawsuits).
- In other words, it's typical to hear "Telefónica is not the cheapest, I hate them but I have no problems ..."

## Espanix is main IX

- Content in Spain is mainly domestic (around 50% or more)

# Competitive offer in Spain

**ONO**

**¡Ofertón ONO!** 6Mb de Fibra Óptica ONO a un precio de locos ¡Oferta prorrogada hasta el 2 de

Apúntate a la Mejor Conexión del Mercado

**OFERTÓN ESPECIAL 6MB ONO**

**6Mb de Fibra Óptica Reales**

**CON LÍNEA Y LLAMADAS INCLUIDAS**

CUOTA  
DE LÍNEA  
INCLUIDA

OFERTA  
EXCLUSIVA  
ONLINE

ANTES  
~~49~~<sup>90</sup>  
€/mes

AHORA SOLO:

**29**<sup>90</sup>  
€/MES  
DURANTE  
UN AÑO

Contrátalo  
**YA**

**INSTALACIÓN Y WIFI GRATIS**

6 Megas Reales por 29,90 €/mes durante 1 año. ¡Contrátalo aquí!

# The Netherlands



Broadband penetration is around 37% dominated by KPN, and 2 cable operators UPC and Ziggo

- KPN, Ziggo and UPC have had open peering strategies for years and there is settlement free peering with all major and minor other ISPs, hosting providers and other content providers.
- UPC and Ziggo (cable operators) are aggressive in pushing triple play TV and Internet services (speeds 50 – 80 Mbps).

Ams-IX is one of the largest Internet Exchanges, in multiple sites in Amsterdam

- Good cooperation between large content providers (e.g. the Dutch Public Broadcasting organization or major media streaming providers) to ensure adequate peering capacity
- Amsterdam has developed into a “content hub”, with many large volume web hosting providers

# Competitive offers in the Netherlands

## Internet, Bellen en TV van KPN: voordelig in 1 pakket

Vijf redenen waarom al meer dan 2 miljoen klanten voor KPN kozen:



- > Internet thuis én buiten | [meer over Altijd Online](#)
- > Betrouwbaar en stabiel netwerk van KPN | [meer over het KPN netwerk](#)
- > Interactieve TV: digitale televisie met meer dan 50 t
- > Haal meer uit je tv met Interactieve TV | [meer over li](#)
- > KPN regelt het overstappen voor je | [meer over ove](#)
- > **Vanaf april verhoogde internetsnelheden en nieu**

## UPC Alles-in-één Voordeelpakket! voor slechts € 45,- (Prijs excl. Standaard Radio/TV is € 28,20 p/m)



- Fiber Power 25
- Bellen Standaard
- Digitale TV Starter
- Standaard Radio/TV
- Nu incl. 6 maanden Film1 of Sport1

Bron: internetten.nl - jan 2010

PAK DIT VOORDEEL

# Conclusions



- One EU  $\leftrightarrow$  Many peering cultures.
- Peering culture has no direct impact on price of end-user services.
- Lack of competition results in less attractive end-user offerings (Belgium, Spain).
- Effective regulation for competitive access drives competition and innovation (France!)

# Do you want to know more?

- [paul.weterman@globalcrossing.com](mailto:paul.weterman@globalcrossing.com)
- [bart.vandersloot@globalcrossing.com](mailto:bart.vandersloot@globalcrossing.com)
- [roland.vrijheid@globalcrossing.com](mailto:roland.vrijheid@globalcrossing.com)



Or come to our booth....

# ....and test your dart skills (tonight!)



and win.....





# THANK YOU

(lunchtime!)

Click to edit Master subtitle style

Bart van der Sloot  
Director Carrier Services  
Product Management  
Benelux and CEE

Paul Weterman  
Director  
Data Services & IP EMEA

# Broadband Penetration

