



Internet Access and Service Pricing (1)

How it works, service segmentation
Various types of access, Access market evolution

Regional seminar on costs and tariffs
for the TAF group member countries
Yaounde, April 5-6, 2004

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1- The actors an their business model

- ▶ **PART 1 - The actors and their business model**
- ▶ **PART 2 - Segmenting the service offer**
- ▶ **PART 3 - Various types of access**
- ▶ **PART 4 - Internet access tariffs and competition**
- ▶ **PART 5 - Access market evolution**



Value Chain and Segmentation

▶ Who are the players ?

- end user, subscriber, service provider, content provider, access provider, network provider, state, supplier, ...

▶ What are they earning from whom ?

▶ What are they paying to whom ?

▶ For which service ?

These are the basic questions we will reply



Which services for the end user ?

- ▶ **Access to the World Wide Web**
 - a fully mesh “best-effort” network of interconnected servers
- ▶ **E-mail**
 - mail box with a certain capacity
 - additional features such as virus detection/repair, SPAM control, Firewall service ...
- ▶ **Optionally, a fixed IP address**
- ▶ **Work group features**
- ▶ **Hosting of Web pages**
- ▶ **Customized basket of information services**



Several business models for an ISP

▶ Access + Internet services for a monthly fee

- Via telephone network
- Via ISDN
- Via xDSL
- Via Cable

▶ Call by call access

- Access via switched telephony network paid on a call by call basis (duration + call setup revenue sharing)

▶ Free access direct on the web (e.g. MSN)

Note : Wireless Access today remains under control of the Wireless Operators (not the same regulatory obligations)



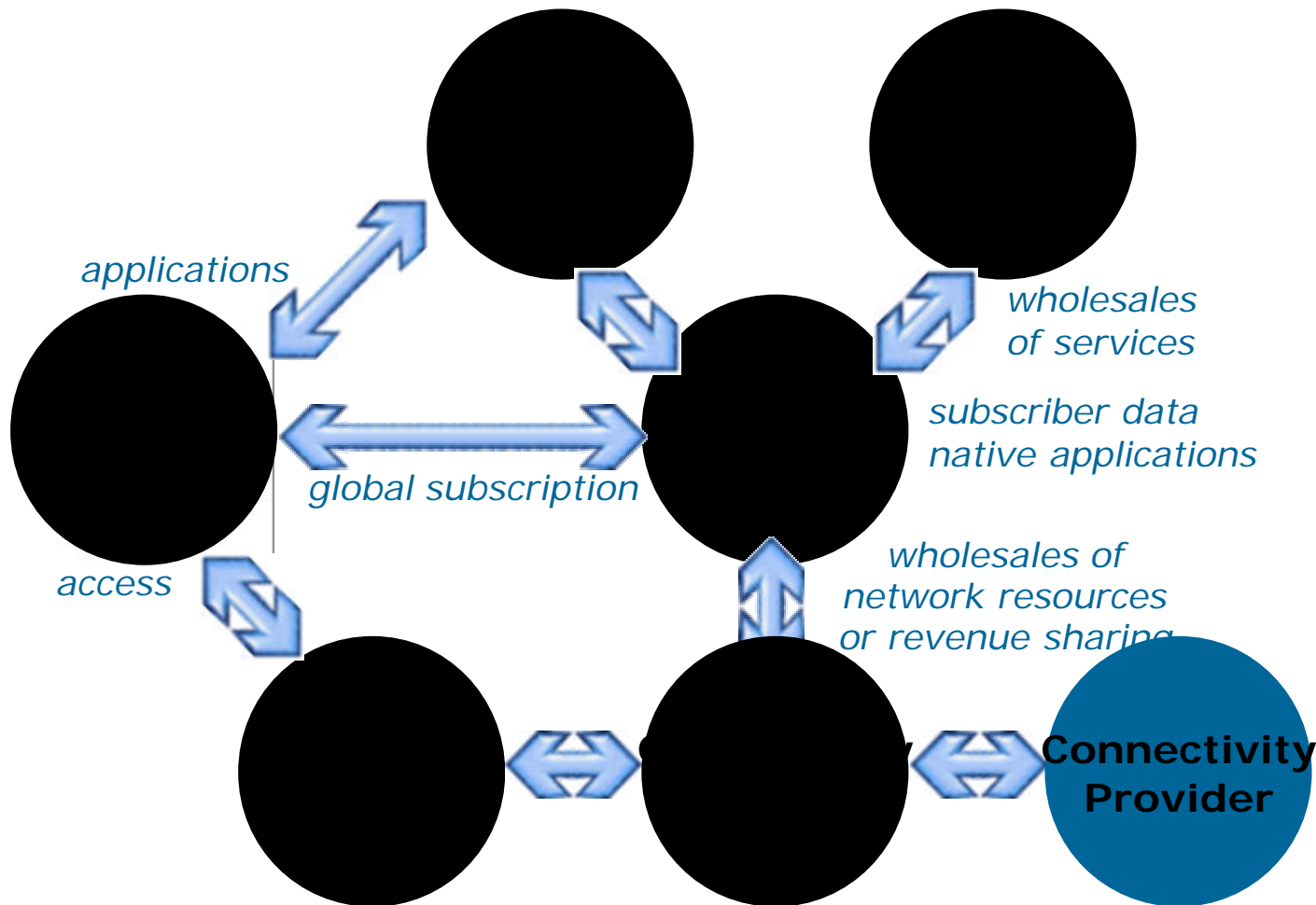
Several types of end user with different needs

- ▶ Residential low end
- ▶ Residential high end
- ▶ SOHO (small office home office)
- ▶ SME (small and medium enterprises)
- ▶ Large Enterprises

Delivering service to the 3 first segments is largely depending on Public Telephony (fixed / mobile) or Cable Carriers

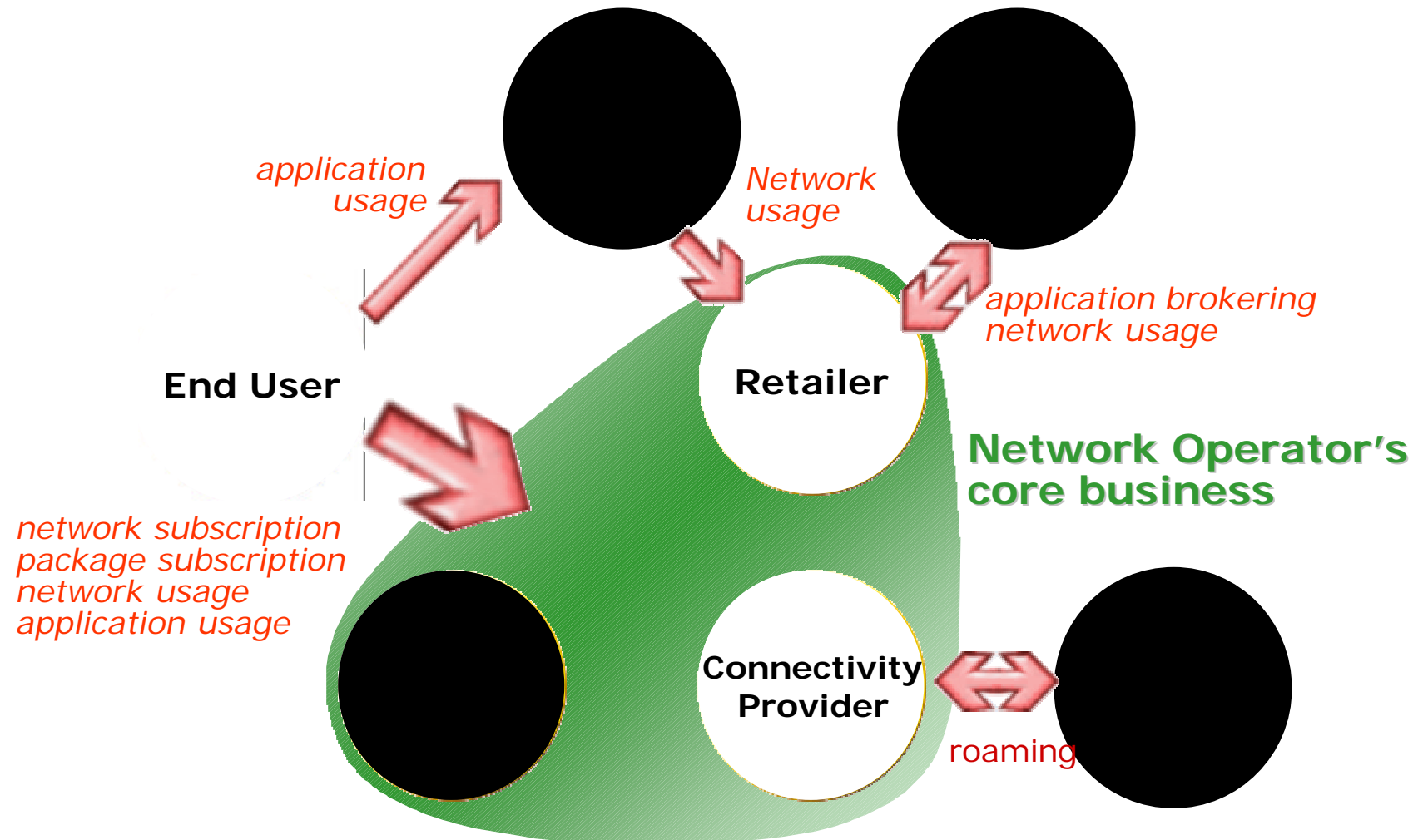


Business Models in Telecom are not straight forward anymore





Example Revenue Streams for a Network Operator





2- Segmenting the service offer

- ▶ **PART 1 - The actors and their business model**
- ▶ **PART 2 - Segmenting the service offer**
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Segmenting services

All Internet Services are not equal

▶ Free "Goodies"

- Often part of a service bundle
- Cannot easily be sold stand alone

▶ Bundle / Solution suite

- Satisfy a targeted segment's needs
- Key bundles: Package for SMEs, teleworking for remote workers

▶ Incremental services

- Can generally be sold stand-alone
- Bundled to build a customized solution
- Generally the focus of market researches



Segmenting services

Access-linked and Web Services (1)

- ▶ **The user pays for services but the cost for residential and SOHO is in access**
 - A set of basic services is always linked to the access
 - E-mail, web page hosting, web search engine, basket of information services
 - A few differentiating services are added to grab new users
 - e.g. bundled or discounted web services that would be paid if accessed over the net

- ▶ **Free Web services exist in numbers**
 - They are paid by advertisement or driving towards further business
 - Hotel booking, transportation booking and timetables,
 - Limited featured subset used to promote fully featured paid service or product
 - They are often associated with data mining and generate customer driven marketing action



Segmenting services

Access linked and Web Services (2)

▶ **E-commerce is not an access-linked service**

- It is a web service that uses a secured communication protocol (https) on top of IP between a secured server and someone connected to the web

▶ **E-learning is not an access-linked service**

- It is a web service that uses voice, data and image and video transport on IP for which transport (and subsequently access) speed is a key efficiency requirement

▶ **Mere Internet telephony is not an access-linked service**

- Net2phone, Yahoo phone, ... are web services impacted by the best effort limitations on the web



Segmenting services

Access linked and Web Services (3)

- ▶ **High speed access and more specifically x-DSL brings new access-linked services**
 - Voice on xDSL can allow a quality IP telephone service if handled specifically by the access provider
 - Television on xDSL is a specific access-linked service

- ▶ **Wireless access brings new-access linked services**
 - Location based services
 - Mail transfer and presentation, unified messaging
 - Content delivery or presentation services on dedicated portals

- ▶ **Access-linked services can be either**
 - Bundled with access fees
 - or considered as incremental services paid directly on usage or for a monthly added fee



3- Various types of Access

- ▶ **PART 1 - The actors and their business model**
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Various types of access Residential Users

▶ Access + Internet services for a monthly fee

PSTN	Still used by a majority of users in most countries. Inconvenience : call set up needed, unavailability of telephone line for voice. Highly competitive, low margin
ISDN	Always on was a promising feature, not promoted by incumbent operator, now obsolete due to 128K ADSL
Cable	First in time residential high speed Internet. Coverage issues, need cable TV services to be profitable, in competition with Satellite TV
xDSL	The privileged access today and tomorrow : flexibility, openness to higher speed

▶ Call by call access

- Access via PSTN paid on a call by call basis (duration + call setup revenue sharing with telephone operator)

▶ Mobile access



Various types of fixed access Business Users

▶ Large enterprises

- Leased lines
- Public data networks, Internet access combined with VPN and data networking requirements, eventually extended to voice services

▶ Small and Medium Enterprises

- Public data networks
- xDSL

▶ Use of residential or mobile access for teleworkers and people on the move

▶ Needs in terms of services and budget are very different



Our focus fixed Internet access with extended customer reach

▶ In this seminar we will not focus on

- Leased lines and Public data networks
- Mobile Internet services, WAP, GPRS, & their evolution to Edge and UMTS
- Cable access services

▶ Our focus will be on the deployment of Internet services for mass users and its impact on public telephone networks and the public telecom operators



4- Internet access tariffs & competition

- ▶ **PART 1 - The actors and their business model**
- ▶ **PART 2 - Segmenting the service offer**
- ▶ **PART 3 - Various types of access**
- ▶ **PART 4 - Internet access tariffs and competition - Detailed analysis of the French example**
- ▶ **PART 5 - Access market evolution**



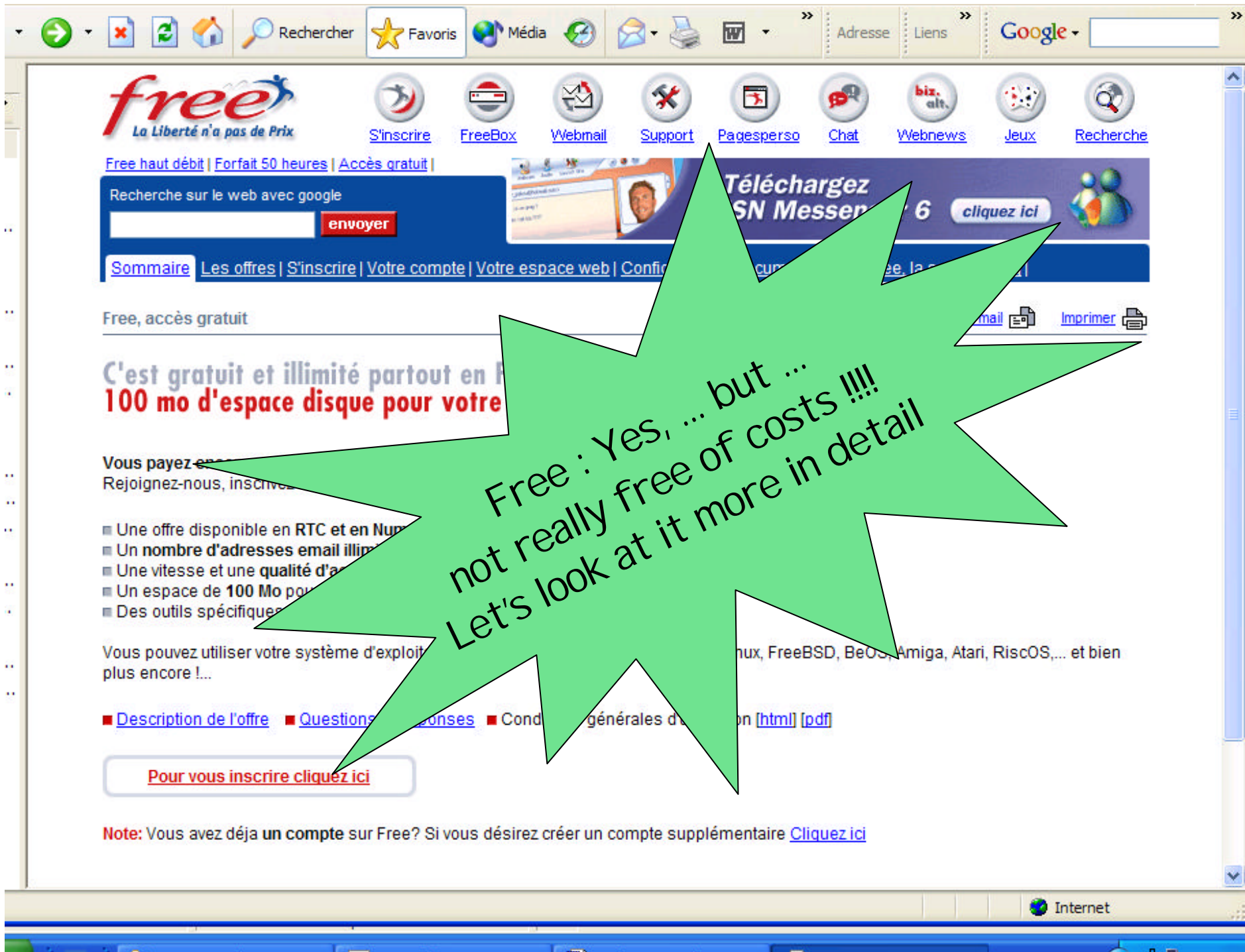
Internet access via PSTN

▶ Call by call access

- with a customer account giving access to customer dedicated services
- without a customer account, “free” access to the web only

▶ Monthly fee

- with a customer account



Free : Yes, ... but ...
not really free of costs !!!!
Let's look at it more in detail

free
La Liberté n'a pas de Prix

- S'inscrire
- FreeBox
- Webmail
- Support
- Pagesperso
- Chat
- Webnews
- Jeux
- Recherche

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Note: Vous avez déjà un compte sur Free? Si vous désirez créer un compte supplémentaire [Cliquez ici](#)



Internet Connections via PSTN

2004

SERVICES D'INTERCONNEXION
Catalogue de France Télécom

OFFRE D'INTERCONNEXION POUR LES EXPLOITANTS DE RÉSEAUX OUVERTS AU PUBLIC L. 33-1

- ▶ **Internet access providers offering their services via PSTN are bound by their interconnection agreement with FT**
- ▶ **Such agreement is based on the catalogue issued by FT after negotiations and approval by the French Regulatory Authority ART. Calculations here are based on 2004 tariffs**



Internet Connections via PSTN

Extract from FT interconnection catalogue

Tarif 2004 pour l'accès vers les numéros de type 0860PQMCDU et 0868PQMCDU, gratuits pour l'appelant, et de type 0860PQMCDU, payants, pour le trafic issu des abonnés de France Télécom

(en euros)	Tarif normal		Tarif réduit		Tarif bleu nuit	
	Charge d'établissement d'appel (€ par appel)	Partie variable en € / min	Charge d'établissement d'appel (€ par appel)	Partie variable en € / min	Charge d'établissement d'appel (€ par appel)	Partie variable en € / min
Trafic livré sur CA de raccordement	0,00114	0,00496	0,00073	0,00320	0,00049	0,00213
Trafic livré à un PRO	0,00358	0,00883	0,00230	0,00569	0,00153	0,00379
Majoration « services Internet » (prix par minute)	0,00017		0,00011		0,00007	
gradient horaire	1,165		0,750		0,500	

▶ **This settle the play ground**

▶ **Competition may start !**

- Reduced rate : 7-8, 19-22, Monday - Friday
7-22 Saturday, Sunday, Holiday
- "Night blue" rate : 22 next day, everyday



2004 PSTN Internet Access Tariffs

“Free” Internet access (1)

▶ “Free” access = revenue sharing with PSTN

- The user pays a local call price to France Telecom i.e.
 - €0.106 indivisible for the first minute
 - €0.02 per additional minute
- The revenues are collected by France Telecom and shared with the access provider (4% revenue sharing fee kept by France Telecom from July 2004 onwards).
- The access provider support the interconnection costs and pays the call by call interconnection fees to FT as follows :
 - Direct connection to subscriber exchange *
 - €0.00114 call set-up fee
 - €0.00496 per minute
 - €0.00017 add on fee for “Internet service” per minute
 - Connection through transit exchange *
 - €0.00358 call set-up fee
 - €0.00883 per minute
 - €0.00017 add on fee for “Internet service” per minute

* busy hour reference fees, lower rates in slack hours, without negotiated discount



2004 PSTN Internet Access Tariffs “Free” Internet access (2)

- ▶ **Which business from one “Free” Internet user ?**
- ▶ **At first glance :** Interconnection fees and internet access pricing seems to be very very low compared to old telephone service. Let's see ..
- ▶ **Connection at Local Exchange level**

Nr of calls x duration	1x1'	1x60'	30x30'
Revenues generated by user (€)			
Interconnection fees (€)			
Revenue sharing fees (€)			
Total revenue for FT (€)			
Margin for the Access provider (€)			

▶ **Please calculate**



2004 PSTN Internet Access Tariffs “Free” Internet access (2)

- ▶ **Which business from one “Free” Internet user ?**
- ▶ **At first glance :** Interconnection fees and internet access pricing seems to be very very low compared to old telephone service. Let's see ..
- ▶ **Connection at Local Exchange level**

Nr of calls x duration	1x1'	1x60'	30x30'
Revenues generated by user (€)	0.106	1.29	21.16
Interconnection fees (€)	0.00627	0.309	4.65
Revenue sharing fees (€)	0.00424	0.051	0.85
Total revenue for FT (€)	0.011	0.36	5.50
Margin for the Access provider (€)	0.095	0.93	15.66

- ▶ **Finally a good working business model**



2004 PSTN Internet Access Tariffs “Free” Internet access (3)

- ▶ **Which business from one “Free” Internet user ?**
- ▶ **At first glance :** Interconnection fees and internet access pricing seems to be very very low compared to old telephone service. Let's see ..
- ▶ **Connection at transit level**

Nr of calls x duration	1x1'	1x60'	30x30'
Revenues generated by user (€)			
Interconnection fees (€)			
Revenue sharing fees (€)			
Total revenue for FT (€)			
Margin for the Access provider (€)			

▶ **Please calculate**



2004 PSTN Internet Access Tariffs “Free” Internet access (3)

- ▶ **Which business from one “Free” Internet user ?**
- ▶ **At first glance :** Interconnection fees and internet access pricing seems to be very very low compared to old telephone service. Let's see ..
- ▶ **Connection at Transit Exchange level**

Nr of calls x duration	1x1'	1x60'	30x30'
Revenues generated by user (€)	0.106	1.286	21.16
Interconnection fees (€)	0.0125	0.540	8.15
Revenue sharing fees (€)	0.00424	0.051	0.85
Total revenue for FT (€)	0.0168	0.591	9.00
Margin for the Access provider (€)	0.089	0.695	12.16

- ▶ **Better revenue for FT, Margin issue for ASP**



2004 PSTN Internet Access Tariffs “Free” Internet access (4)

- ▶ **Competitive pricing of “free” call by call Internet access in France, offered by a number of actors, but not all**
 - “9 Telecom, Cario, “Easyconnect”, “Free”, “Freesurf”, “La Poste”, “Nordnet”, “Tiscali”, “Wanadoo”, are offering this charging rates
 - €0.106 indivisible for the first minute
 - €0.02 per additional minute
 - “Oreka” is offering the service at a lower price, also using the revenue sharing scheme with FT
 - €0.106 indivisible for the first minute
 - €0.015 per additional minute
 - AoL and Club-Internet do not offer this service

- ▶ **Please calculate revenues and margins in the case of “Oreka” for 30 calls of 30’**



2004 PSTN Internet Access Tariffs

“Free” Internet access (5)

▶ **Business model for the end user**

- Pay as you use - no commitment

▶ **Business model for France Telecom**

- FT is obliged by the legislation to offer the access to its subscribers to ISPs, at regulated prices
- FT is a wholesaler of the communications between its subscribers and the ISPs
- It comes on top of subscription fees (€ 13/month) and is an add on no-risk profitable business in spite of lower margins compared to telephone service

▶ **Business model for ISPs**

- A competitive service offering benefiting of the FT customer reach



2004 Internet PSTN Access Tariffs

Monthly Internet access fee (1)

▶ A package of services offered for a monthly fee

- The user does not pay the communication to FT
- No revenue sharing but the same interconnection charges
 - Direct connection to subscriber exchange *
 - €0.00114 call set-up fee
 - €0.00496 per minute
 - €0.00017 add on fee for “Internet service” per minute
 - Connection through transit exchange *
 - €0.00358 call set-up fee
 - €0.00883 per minute
 - €0.00017 add on fee for “Internet service” per minute

▶ Package includes a limited connection time

- e.g. 2, 5, 10, 20, 50 or even 65 to 100 hours
- additional time at a higher price per minute (€ 0.03-0.05) or per hour
- ***AOL attempt of unlimited access via PSTN was a disaster for them and makes no sense now with xDSL. They now offer 50 hours for €16.9 with €3 per additional hour***

* busy hour fee, lower rates in slack hours



2004 Internet PSTN Access Tariffs Monthly Internet access fee (2)

▶ **What revenues can be expected from this service ?**

▶ **Connection at Local Exchange level example case**

Tariff = bundled connect. time (hours)	2	5	10	25	65
Monthly Price = Revenue (€)	5	8	10	18	28
Nr of calls x duration (example)	20 x 6'	25 x 12'	30 x 20'	50 x 30'	30x30'

Max Interconnection fees * (€)

Margin for the access provider* (€)

Reduced Interconnection fees** (€)

More margin for the IASP (€)**

▶ **Please calculate**

* busy hour reference fees,

** 50% of calls and time spent on reduced tariff rate



2004 Internet PSTN Access Tariffs Monthly Internet access fee (2)

▶ What revenues can be expected from this service ?

▶ Connection at Local Exchange level example case

Tariff = bundled connect. time (hours)	2	5	10	25	65
Monthly Price = Revenue (€)	5	8	10	18	28
Nr of calls x duration (example)	20 x 6'	25 x 12	30 x 20	50 x 30'	30x30'
Max Interconnection fees * (€)	0,63	1,56	3,11	7,75	20,06
Margin for the access provider* (€)	4,37	6,44	6,89	10,25	7,94
Reduced Interconnection fees** (€)	0,53	1,29	2,56	6,38	16,50
More margin for the IASP** (€)	4,47	6,71	7,44	11,62	11,50

▶ **Quite reasonable for 2 to 25 hours, a revenue issue for very long time**

* busy hour reference fees,

** 50% of calls and time spent on reduced tariff rate



2004 Internet PSTN Access Tariffs Monthly Internet access fee (3)

▶ Connection at transit exchange level example case

Tariff = bundled connect. time (hours)	2	5	10	25	65
Monthly Price = Revenue (€)	5	8	10	18	28
Nr of calls x duration (example)	20 x 6'	25 x 12'	30 x 20'	50 x 30'	30x30'

Max Interconnection fees * (€)

Margin for the access provider* (€)

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More margin for the IASP (€)**

▶ Please calculate

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2004 Internet PSTN Access Tariffs Monthly Internet access fee (3)

► Connection at transit exchange level example case

Tariff = bundled connect. time (hours)	2	5	10	25	65
Monthly Price = Revenue (€)	5	8	10	18	28
Nr of calls x duration (example)	20 x 6'	25 x 12'	30 x 20'	50 x 30'	30x30'
Max Interconnection fees * (€)	1,14	2,77	5,47	13,59	35,05
Margin for the access provider* (€)	3,86	5,23	4,53	4,41	- 7,05
Reduced Interconnection fees** (€)	0,94	2,28	4,51	11,20	28,89
More margin for the IASP** (€)	4,06	5,72	5,49	6,80	-0,89

Not a good business model

**But another interconnection scheme is also offered to ISPs
implying a direct connection at local or transit levels paid at a
fixed monthly price independantly of the handled traffic.**

* busy hour reference fees,

** 50% of calls and time spent on reduced tariff rate



2004 Internet PSTN Access Tariffs

Monthly Internet access fee (4)

► Competitive pricing (€)

Connection time(h)	2	5	10	12	15	20	25	35	50	More
9 Telecom	-	6	9	-	-	12	-	-	-	-
AoL	-	-	-	-	-	-	-	-	16,9	-
Cario	-	7	-	10	-	-	-	19	-	24 (80h)
Club-Internet	-	6	-	-	10	-	-	-	15	25 (100h)
Free	-	-	-	-	-	-	-	-	14,94	
La Poste	-	7	10	-	-	-	18.5	-	16.9	-
Nordnet	5	8	10	-	13	-	18	-	23 (45h)	28 (65h)
Tiscali	-	5.5	9.5	-	-	-	-	-	-	-
Wanadoo	-	8	10	-	-	15	-	-	20 (60h)	25 (100h)



2004 Internet PSTN Access Tariffs

Monthly Internet access fee (5)

▶ Several scheme for additional time (examples)

- €3 per additional hour (AoL)
- €0.05 per additional minute (Club-Internet)
- Automatic change to the superior monthly fee (Nordnet)

▶ Competing in Price and Services

- Price and connection time
- Very low discounted entry price for first 100 hours or 3 months of services
- Lower charge for slack hours (e.g. half time discounted)
- Allowing non-used minutes report to the next period (for one year commitment or a monthly service fee (e.g. €3))
- Extending connection time (e.g. 20-50% additional time) if one year commitment
- Bundled service package (mail box, web pages, IP telephony,..)
- Price reduction if subscription to the telephony service of the same service provider (e.g. 9 Telecom)
- **Quality of service (e.g. “This one is more expensive but availability and access speed to servers is always better ...”)**



2004 Internet PSTN Access Tariffs ADSL access pricing

► Competitive pricing - ADSL access operated by FT*

Access Provider	speed	set-up fee (€)	monthly fee (€)**	Comment
9Telecom	512/128	30	24.90	ADSL area
AoL	512/128	---	34;90	ADSL area
AoL	1024/128	---	44.99	ADSL area
Cario	512/128	---	26.90	ADSL area
Cario	1024/128	---	44.90	ADSL area
Cegetel	512/128	30	29.90	ADSL area
Club-Internet	512/128	---	36.90	ADSL area
EasyConnect	1024/128	79	49	ADSL area
Free	1024/128	---	29.99	ADSL area

* service accessible to FT telephone subscribers only (€13 per months)

**including modem rental when not included in set-up fee



2004 Internet PSTN Access Tariffs ADSL access pricing

► Competitive pricing - ADSL access operated by FT*

Access Provider	speed	set-up fee (€)	monthly fee (€)**	Comment
Nordnet	512/1024	---	29	ADSL area
Nordnet	1024/128	---	39	ADSL area
Oreka	512/1024	---	24.50	ADSL area
Tele2Internet	512/128	29.95	24.95	ADSL area
Tiscali	512/128	49	20	ADSL area
Tiscali	1024/128	49	30	ADSL area
Wanadoo	512/128	1	34.90	ADSL area
Wanadoo	1024/128	49	44.90	ADSL area

* service accessible to FT telephone subscribers only (€13 per months)

**including modem rental when not included in set-up fee



2004 Internet PSTN Access Tariffs

ADSL access pricing

► Competitive pricing - Unbundled local loops

Access Provider	speed	set-up fee (€)	monthly fee (€)**	Comment
Alice	1024/128	---	38.94	FT Telephony sxb
Alice	2048/256	---	60.94	including full telephony (POTS)
Alice	1024/128	---	39.94	including full telephony (POTS)
9Telecom	2048/256	---	26.90	If telephony also subscribed
9Telecom	512/128	---	16.90	If telephony also subscribed
AoL	1024/128	---	27.99	FT Telephony sxb

**including modem rental when not included in set-up fee



2004 Internet PSTN Access Tariffs ADSL access pricing

► Competitive pricing - Unbundled local loops

Access Provider	speed	set-up fee (€)	monthly fee (€)**	Comment
Cegetel	1024/256	30	29.90	FT Telephony sxb
Cegetel	2048/256	30	39.90	FT Telephony sxb
Cegetel	2048/256	30	36.90	If Telephony also subscribed
Club-Internet	512/128	---	29.90	FT Telephony sxb
Club-Internet	1024/256	---	39.90	FT Telephony sxb
EasyConnect	1024/256	79	39	FT Telephony sxb
Free	2048/256	---	29.99	FT Telephony sxb
Tele2Internet	1024/256	29.95	24.95	FT Telephony sxb

** Including modem rental when not included in set-up fee



2004 Internet PSTN Access Tariffs

Limited speed ADSL access pricing

► Competitive pricing

Access Provider	speed	set-up fee (€)	monthly fee (€)**	Comment
Alice	128/64	---	24.94	FT Telephony sxb
Alice	128/64	---	25.94	including full telephony (POTS)
AoL	128/64	---	29.99	FT Telephony sxb
Cario	128/64	---	24.90	FT Telephony sxb
Club-Internet	128/64	---	24.90	FT Telephony sxb
EasyConnect	128/64	79	30	FT Telephony sxb
Nordnet	128/64	---	24	FT Telephony sxb
Tele2	128/64	29.95	18.95	FT Telephony sxb
Wanadoo	128/64	---	29.90	FT Telephony sxb

* Including modem rental when not included in set-up fee



2004 Internet PSTN Access Tariffs ADSL access business

- ▶ **Initial ADSL business meant fast Internet**
- ▶ **Unlimited access and keeping the line free for telephony service now becomes a must for many users**
- ▶ **Limited speed ADSL is an add-on business driven to grab new subscribers at lower price**
- ▶ **Unbundling of the local loop and related market share is a critical competitive issue for ISPs today.**
- ▶ **There is a strong link between telephony service and Internet access**
- ▶ **Most of the offers include 1 year commitment or a heavy cancellation fee (in the range of €100)**

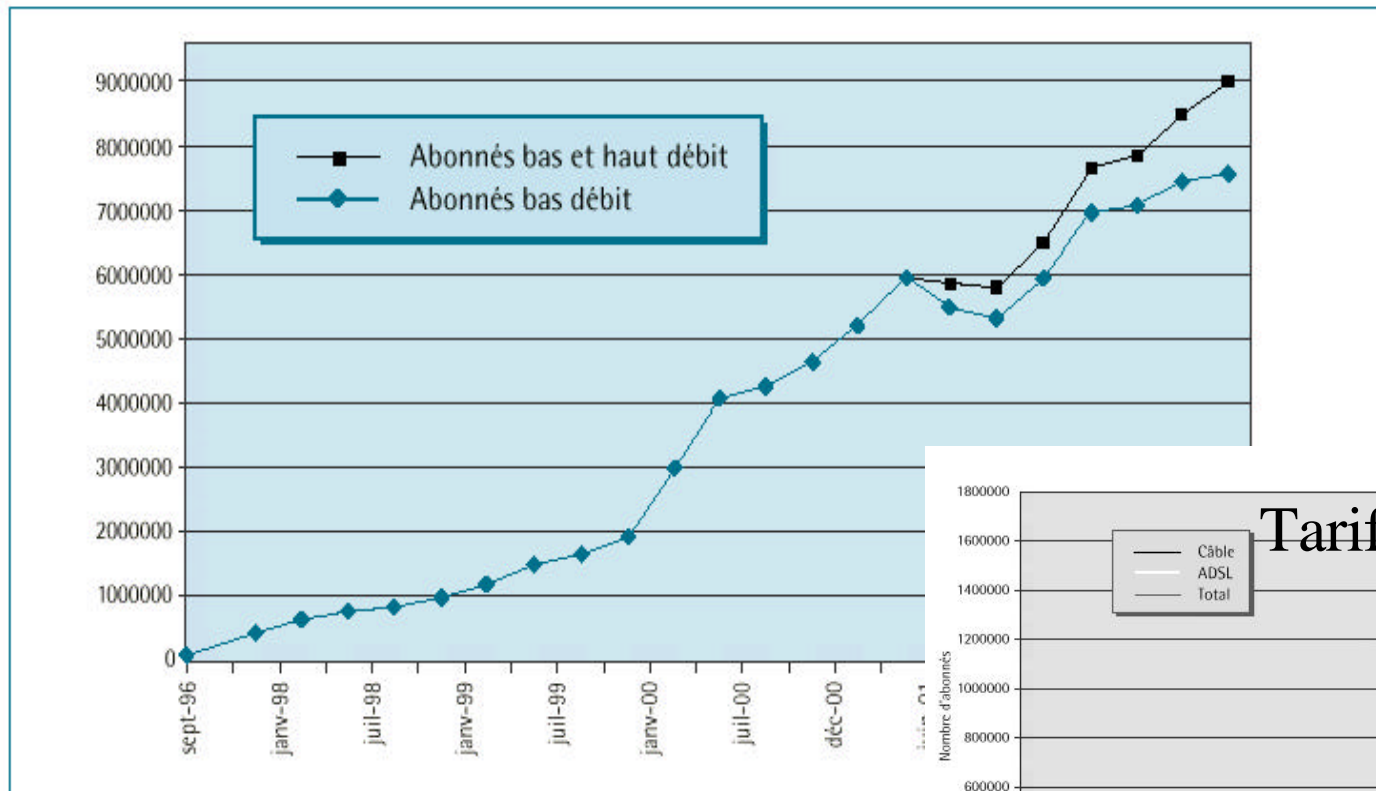


5- Access market evolution

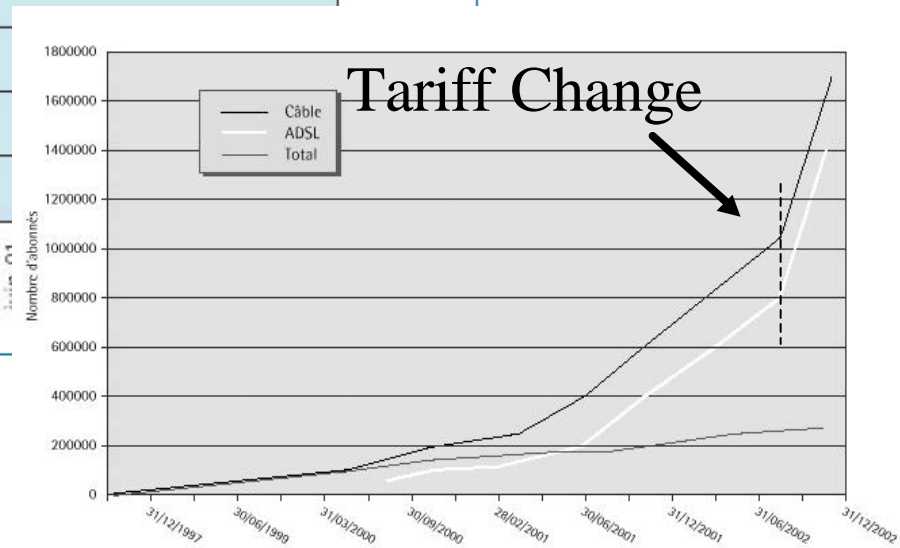
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France - Dialup vs DSL Cable vs DSL



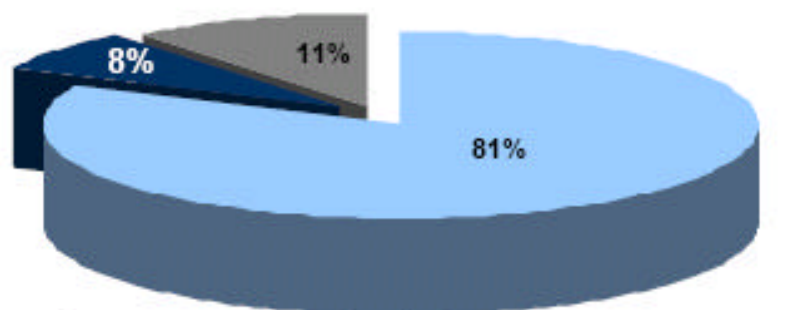
Source AFA, Aform, France Télécom





High speed Internet access by technology (1)

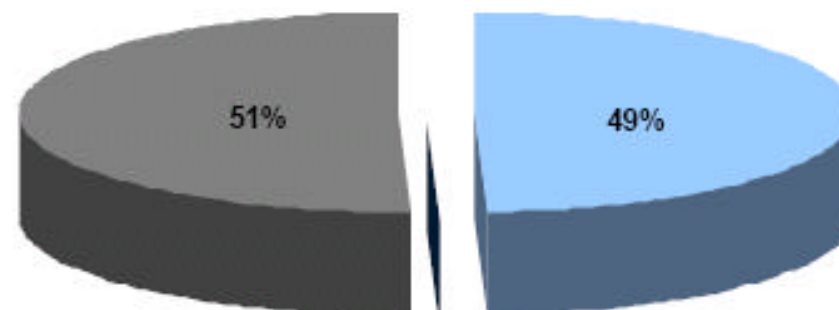
Accès haut débit par infrastructures
France, au 1er janvier 2004



- Accès ADSL activés par l'opérateur historique (tout FAI)
- Accès ADSL dégroupés
- Accès haut débit par câble et autres technologies

Source : Commission européenne, COCOM , mars 2004 (en cours de validation)

Accès haut débit par infrastructures
Royaume Uni, au 1er janvier 2004



- Accès ADSL activés par l'opérateur historique (tout FAI)
- Accès ADSL dégroupés
- Accès haut débit par câble et autres technologies

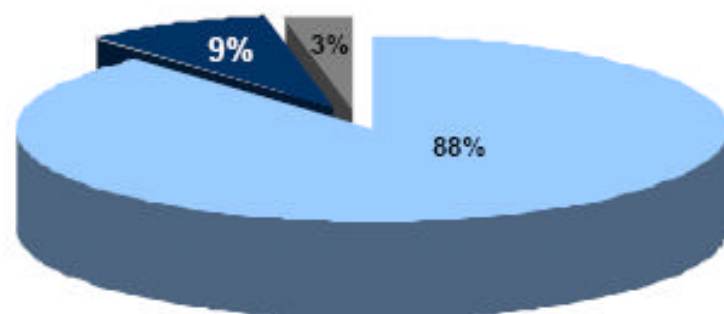
Source : Commission européenne, COCOM , mars 2004 (en cours de validation)

Quoted by ART on their web site



High speed Internet access by technology (2)

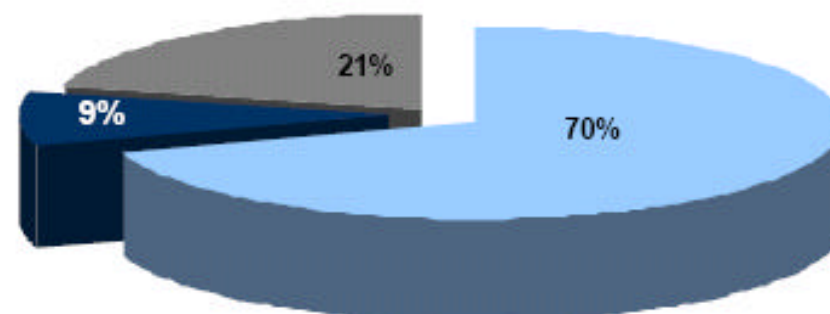
Accès haut débit par infrastructures
Allemagne, au 1er janvier 2004



- Accès ADSL activés par l'opérateur historique (tout FAI)
- Accès ADSL dégroupés
- Accès haut débit par câble et autres technologies

Source : Commission européenne, COCOM , mars 2004 (en cours de validation)

Accès haut débit par infrastructures
Italie, au 1er janvier 2004



- Accès ADSL activés par l'opérateur historique (tout FAI)
- Accès ADSL dégroupés
- Accès haut débit par câble et autres technologies

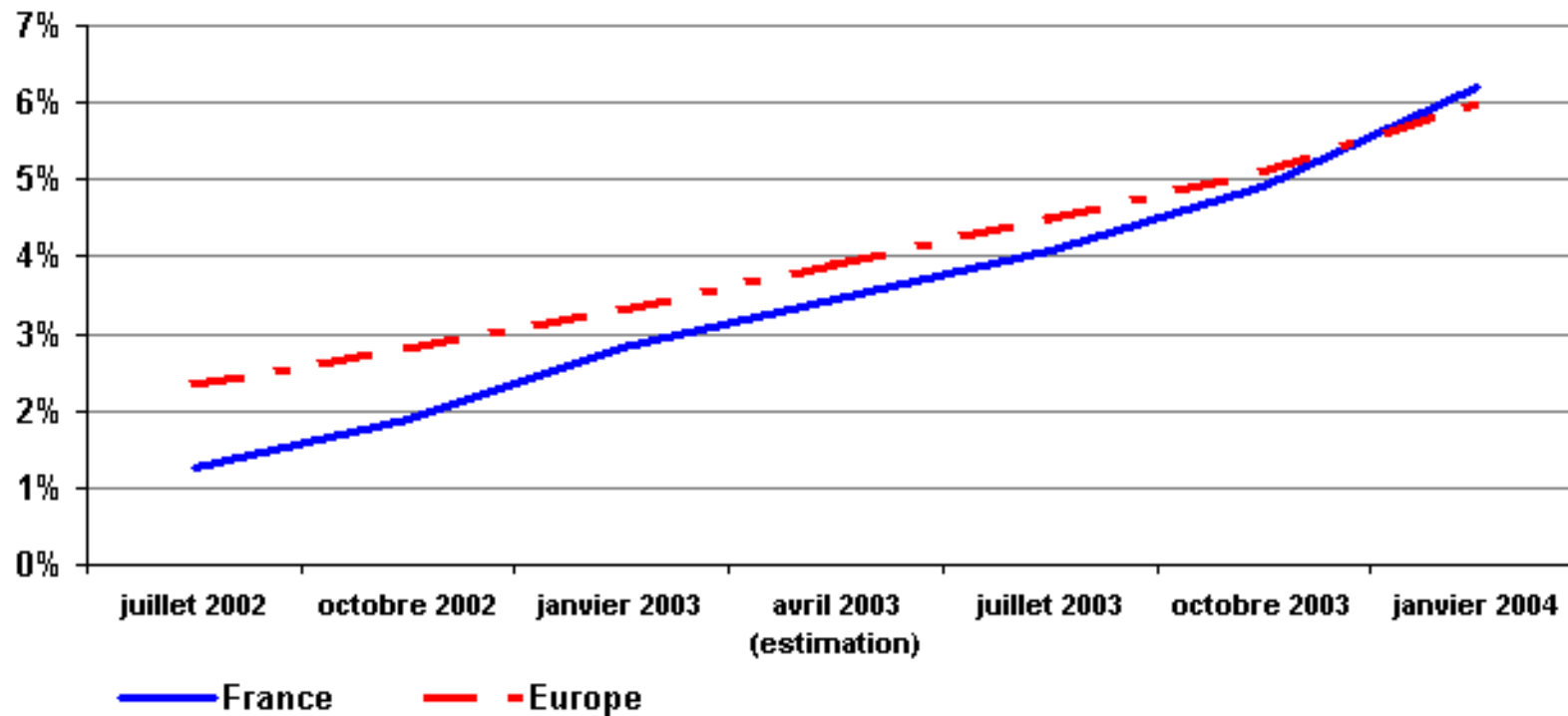
Source : Commission européenne, COCOM , mars 2004 (en cours de validation)

Quoted by ART on their web site



High speed access is significantly growing

Taux de pénétration du haut débit
(nombre d'accès rapporté à la population)



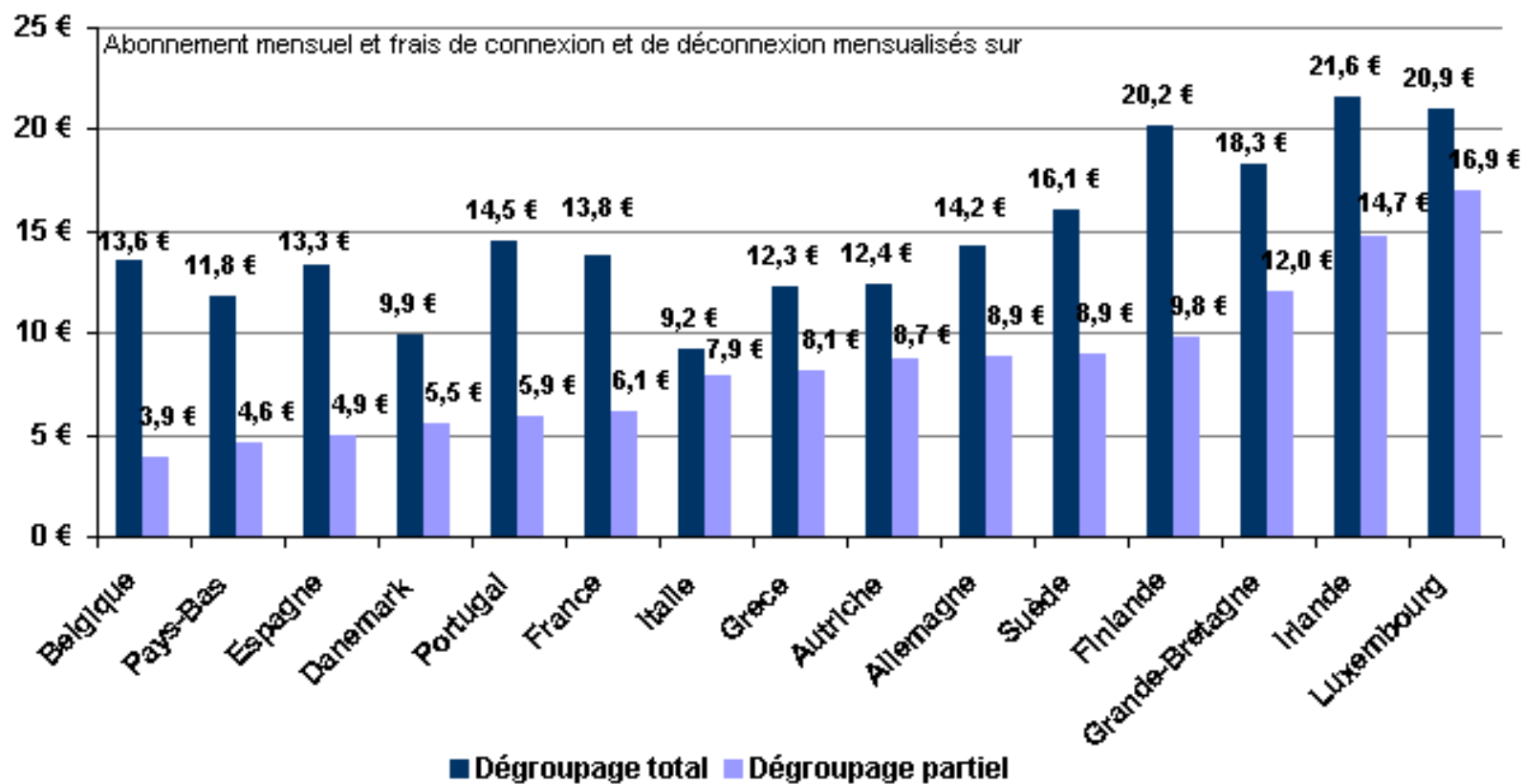
Source : Commission européenne, CECIDM, mars 2004 (en cours de validation)

Quoted by ART on their web site



Local loop unbundling tariffs in Europe

Tarifs du dégroupage
au 1er janvier 2004



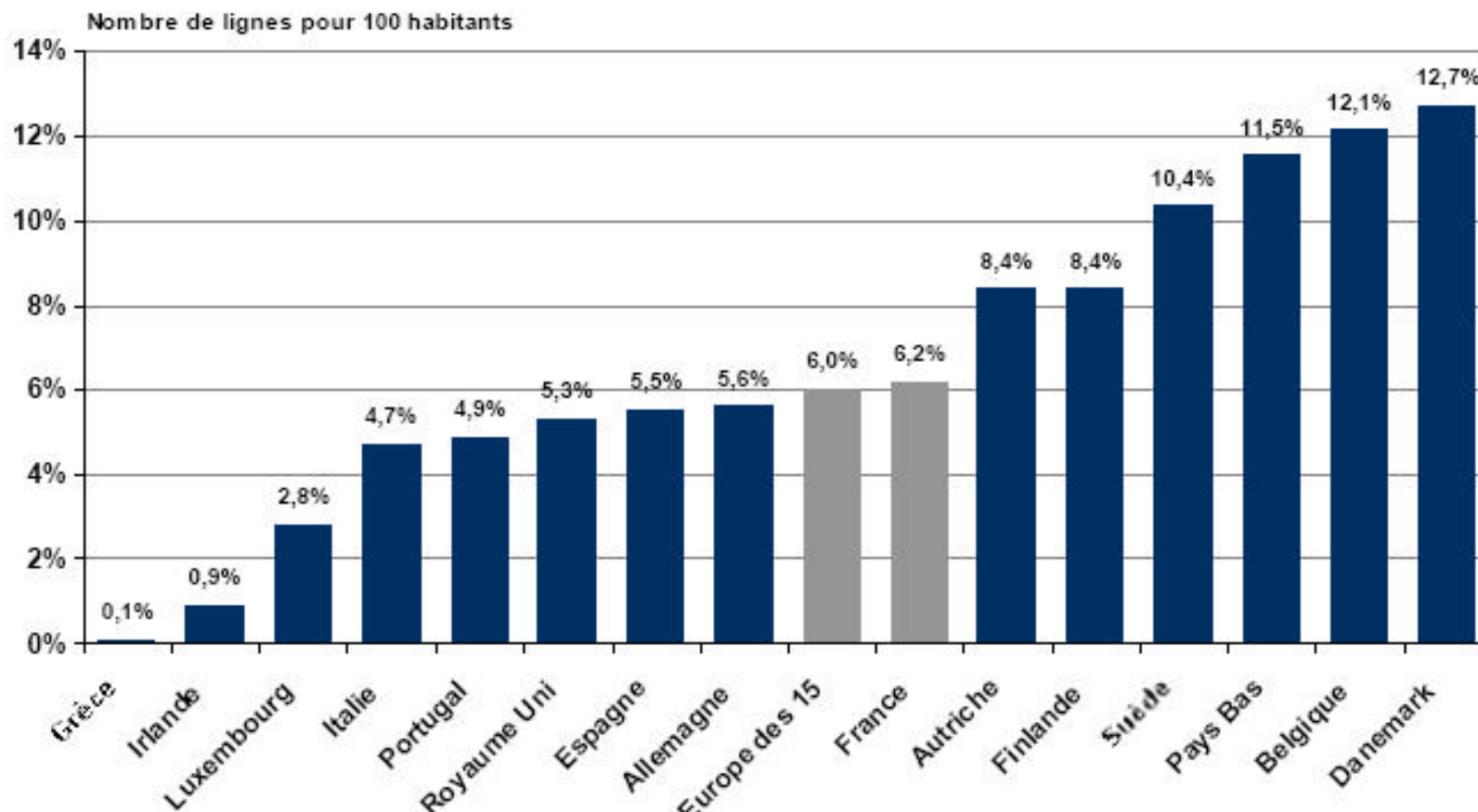
Source : Source ART (mars 2004), enquête auprès des régulateurs

Quoted by ART on their web site



High speed internet penetration rate

Taux de pénétration du haut débit
au 1er janvier 2004

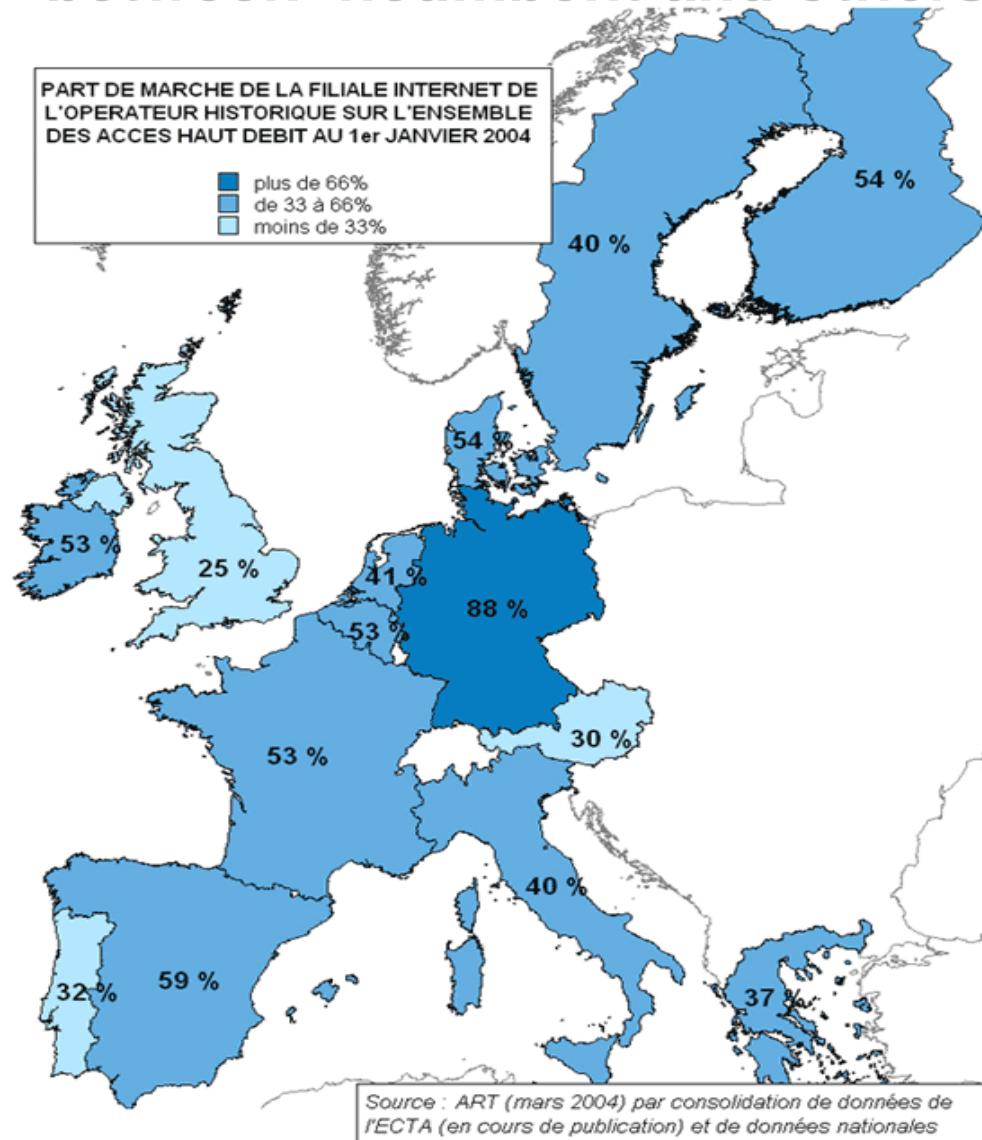


Source : Commission européenne, COCOM, mars 2004 (en cours de validation)

Quoted by ART on their web site



High speed Internet access market shares between Incumbent and others service providers





Thank you

- ▶ **PART 1 - The actors and their business model**
- ▶ **PART 2 - Segmenting the service offer**
- ▶ **PART 3 - Various types of access**
- ▶ **PART 4 - Internet access tariffs and competition - The French example**
- ▶ **PART 5 - Access market evolution**

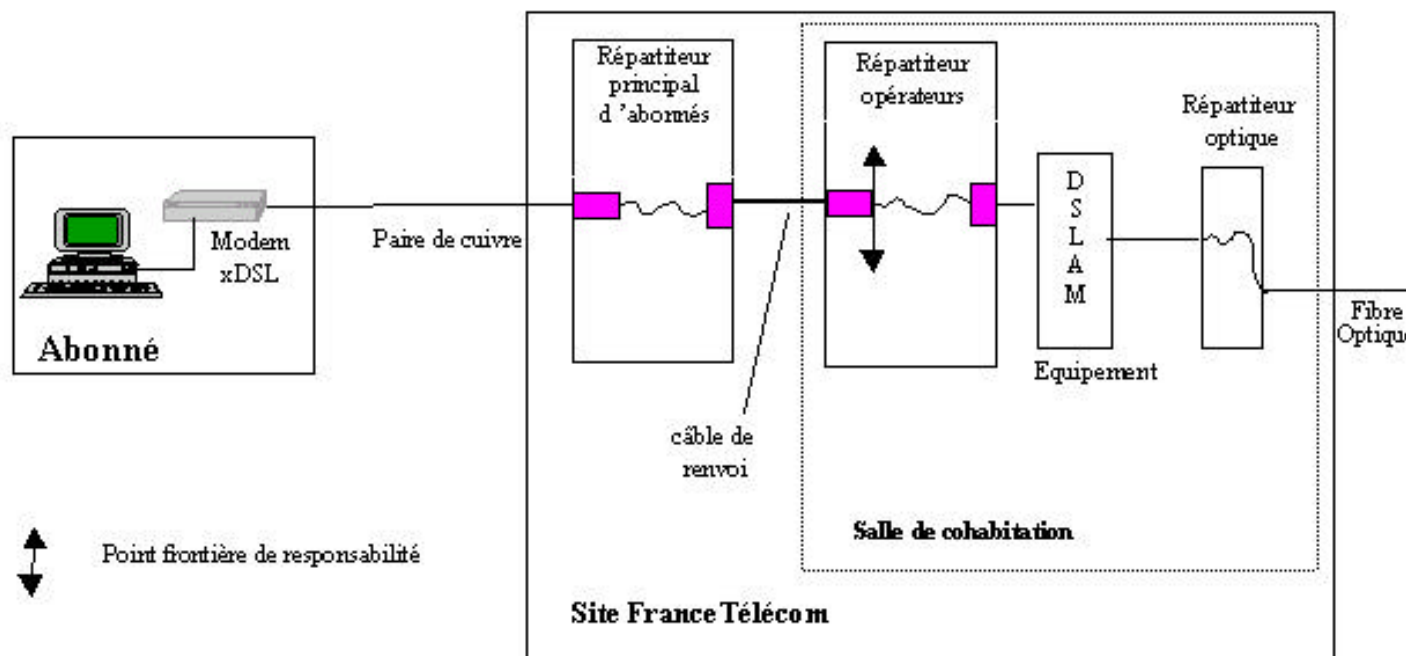


Local loop unbundling

Physical connection on local sites (1)

Full local loop unbundling

Accès totalement dégroupé à la boucle locale de France Télécom



Ref : <http://www.art-telecom.fr>

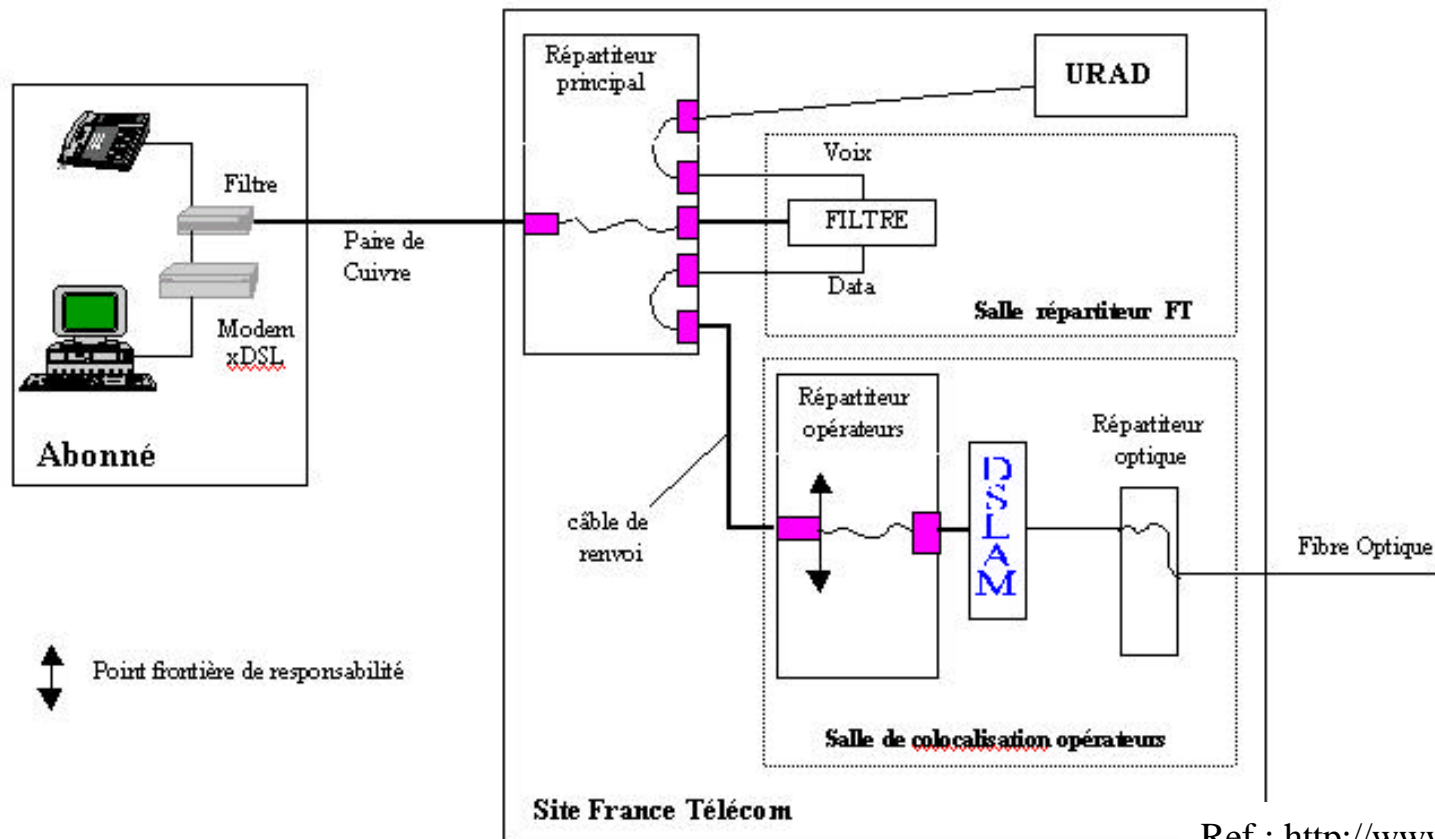


Local loop unbundling

Physical connection on local sites (2)

Shared access (partial unbundling)

Accès partagé à la boucle locale de France Télécom



Ref : <http://www.art-telecom.fr>