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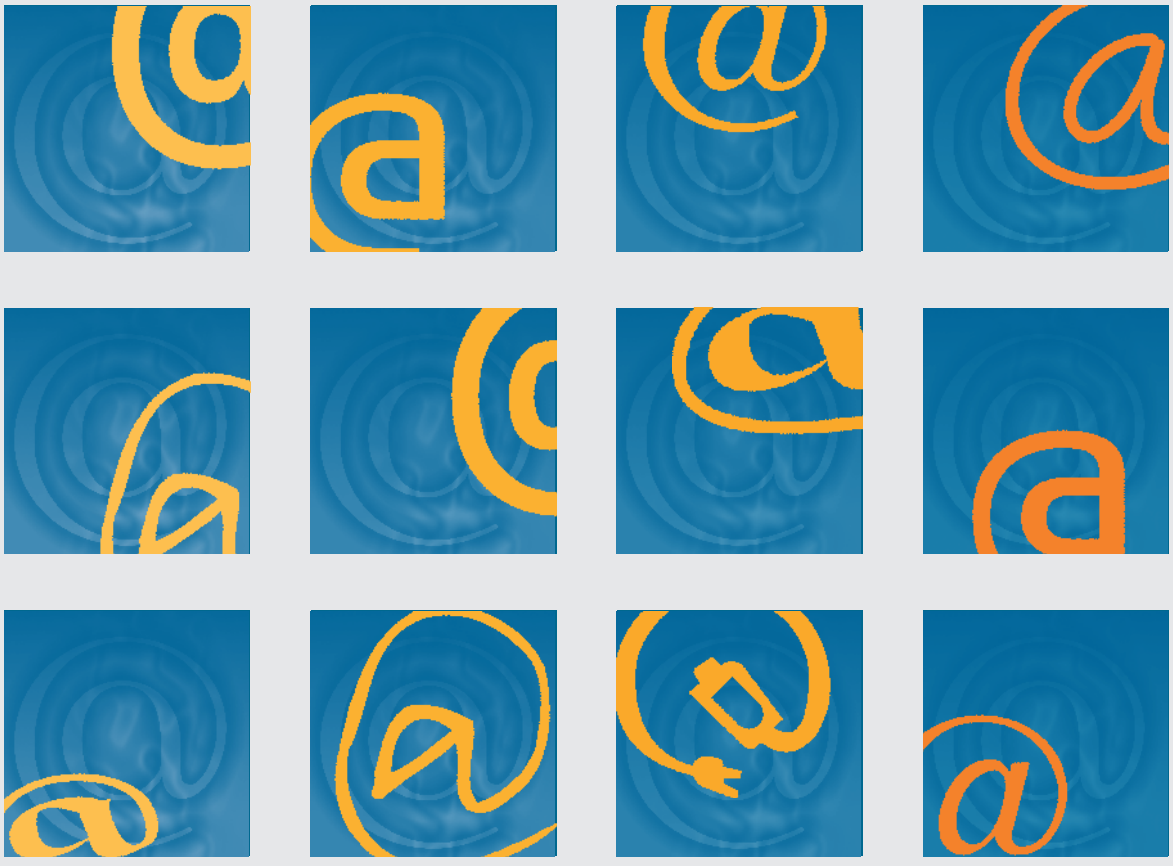
Internet, a review of the French market

March 2003



ART Autorité de Régulation des Télécommunications
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INTERNET, A REVIEW OF THE FRENCH MARKET

Since its creation in 1997, Autorité de régulation de télécommunications (ART) has always worked towards facilitating the development of Internet. In its decisions, it has consistently aimed to ensure that competition is present on every segment of this new means of communication, and to guarantee that consumers benefit not only from affordable prices, but also from technical innovations which expand uses and multiply services.

Over the past five years, we have seen prices drop significantly, Internet networks diversify and new technologies combine Internet and mobility.

The market, which used to be composed of just a few pioneers, is now a strongly growing mass market. ART's recent decisions on unbundling set conditions which will provide France with the economic and operational factors it requires to not only make up for lost time, but also make it a leader in this field.

Today, following ART's most recent decisions, French high- and low-speed access prices are among the lowest in Europe. They should stimulate Internet development strongly in the short term.

New challenges will appear as UMTS (from the mobility world) and high speed are brought together ; ART has already taken decisions on these subjects and is committed, here too, to ensuring that Internet develop as effectively as possible so that consumers have total freedom of choice and player dynamics produce continuous development of innovations and services.

1 FROM LOW-SPEED INTERNET TO HIGH-SPEED AND MOBILE INTERNET

The means of accessing Internet have greatly diversified in the past five years. New available technologies allow higher speeds and introduce new prospects, in particular, access to Mobile Internet.

The ways in which low and medium speeds are defined are necessarily subjective and depend on the content to be exchanged or on the quality of service one considers to be normal.

For some means of access, the downstream speed (downloading from Internet to the PC) has to be distinguished from the upstream speed (transmission, from the PC to Internet). It is also important to distinguish between maximum speed (that can be expected in non-peak times, when few users are connected) and guaranteed speed (which is available even at peak times).

Although arbitrary, these differences are still important for the end user. If poorly understood, consumers may be seriously disappointed when they realise that although they had been promised high-speed Internet access, in practice, it is not much better than dial-up.

For the purposes of this document, we will consider that for residential Internet access, low speed corresponds to dial-up access offers.

A speed of 128 kbits could eventually be considered medium speed. However, such a classification cannot currently be considered standard, and could be in the future only once we see the reactions of end users, who have only recently received this type of offer.

1.1 Wireline technologies

Dial-up access

The switched telephone network has historically been the main way of accessing Internet for residential users. Today, it is still the most commonly used method in France, available on all 34 million telephone lines via a non-geographic number with the format 0860 PQ MCDU. It offers a maximum transfer speed of 33.6 kbit/s which can be optimised slightly using modem compression technologies.

Internet service providers (ISPs) generally provide three types of offers:

- subscription-free offer, charged by the minute, where the surfer pays only the cost of the telephone call based on consumption

- flat-rate offer, composed of a subscription and a number of hours of telephone connection

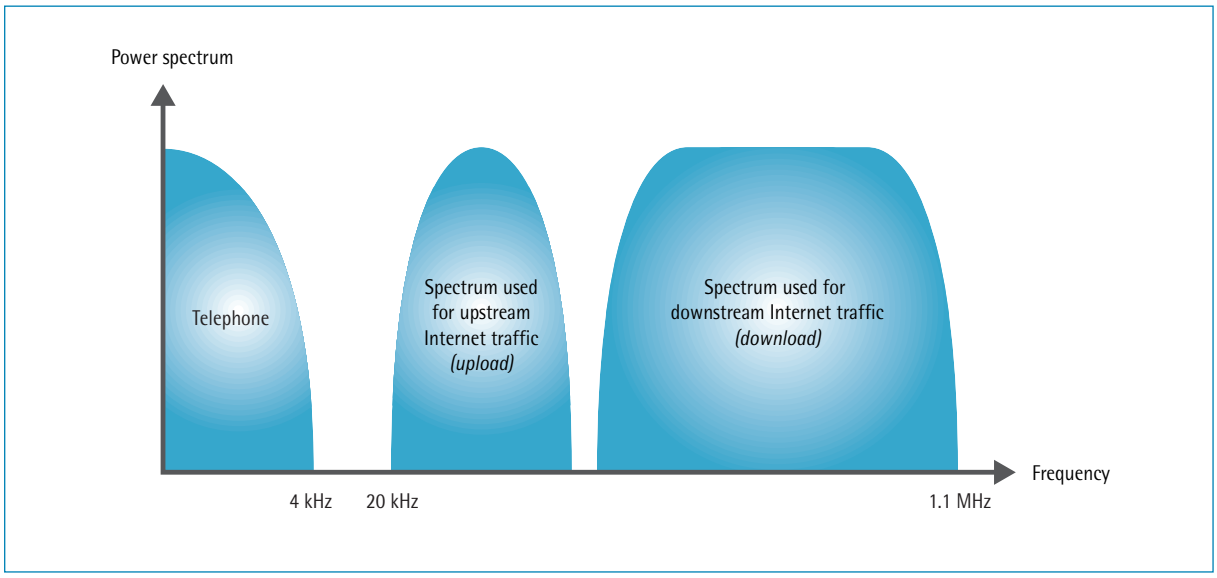
- unlimited or semi-unlimited flat-rate offer, composed of a subscription and telephone connections, regardless of the number or duration of the connections, either permanent (unlimited offer), or at certain times of day or of the week (semi-unlimited offer)

These offers are created using carrier collection services, which deliver the telephone traffic in IP mode to the ISP's national point of presence. Some ISPs collect all or part of the traffic they receive.

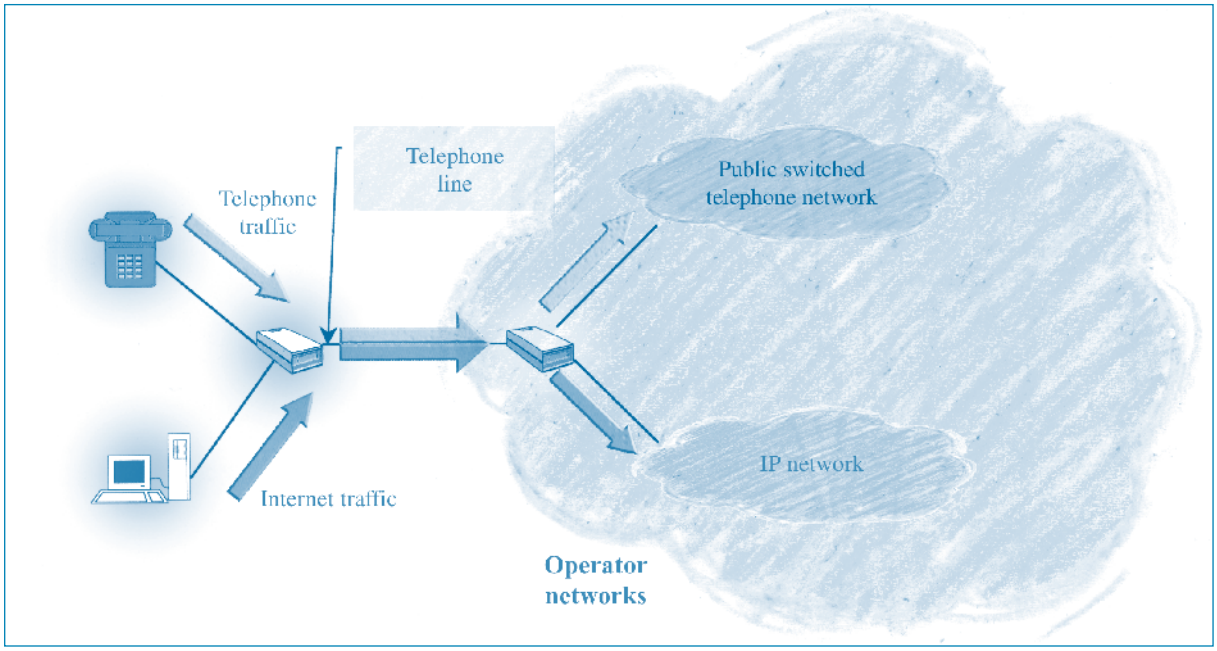
The economic model used by ISPs depends to a great extent on the cost of collection, which is determined by France Telecom's interconnection fees, which must be approved by ART every year in France Telecom's reference offer.

DSL access

• DSL technologies use high frequencies on the copper pair connecting the subscriber to the telephone network, while low frequencies are used for voice. This means that DSL can provide Internet access while leaving the telephone line free.



Internet traffic is carried on the copper pair just like telephone traffic, from the user's computer to a distribution frame, the first element on the switched telephone network. At this point, it is separated from telephone traffic and routed to a separate IP network.



ADSL and SDSL are currently used, but other xDSL technologies such as VDSL are in the works. They differ by the speeds they can offer, by whether they offer symmetrical or asymmetrical upstream and downstream speed, and by the maximum allowable distance between the subscriber and the distribution frame.

Some lines do not have the characteristics required to provide efficient xDSL access.

These technologies also require the installation of specific equipment (DSLAMs) on the network's distribution frame. Either France Telecom installs these elements, or an alternative operator does, at line unbundling[1].

At the first quarter 2003, over 3 000 distribution frames were used, covering close to 60% of the French population.

ISPs offer flat-rate access including permanent and unlimited access with downstream speeds ranging from 128 kbit/s to 1024 kbit/s.

They can be based on:

- France Telecom's ADSL IP collection offer, called "option 5"
- a collection offer from a third-party operator, itself based on France Telecom's ADSL Connect offer, called "option 3"
- a collection offer from a third-party operator, based on partial unbundling, called "option 1"

These options have no technical incidence for the end user, but do allow ISPs to set themselves apart based on the services and prices they propose.

Cable

• Cable networks, initially installed for television broadcasting, can also provide telecommunications services, and Internet access in particular. Cable operators were the first to offer permanent Internet access. For historic and regulatory reasons, cable networks do not cover all of France in a homogenous manner. Instead, the country is divided into geographic areas, each of which is served by an operator.

Internet access by cable requires digitisation and technical upgrading of the networks. Today, it is available to 6 million outlets in 650 municipalities thereby serving close to 15 million inhabitants.

Fibre optics

• Users requiring very high speeds (generally large companies) are connected using fibre optics. Here, potential speeds are upwards of 1 Gbit/s.

[1] When unbundling the local network, France Telecom provides bare copper pairs to an alternative operator, which installs its own transmission equipment on the pairs. Naturally, the user operator pays the incumbent operator for use of the local network. The user operator must place its transmission equipment at the end of the local loop, in order to connect these lines to its own network.

Fibre optics continue to be a costly access mode for residential access, given that in most cases it requires civil engineering works to connect the client. Because of this, this type of access is generally used in major business centres. Potential speeds offered by xDSL technologies have made investing in fibre optic connections for residential clients less attractive.

In the medium term, major development of demand for broadband multimedia services, generating sufficient revenues, or the absence of cable or xDSL technologies, could justify the deployment of an optical infrastructure in the access network. In any case, this development would occur in stages.

1.2 Wireless technologies

Satellite

Satellite access is currently analogous to ADSL or cable in both rural and urban areas. However, it is particularly well suited for isolated areas, which are inaccessible to other types of infrastructures.

Two types of offers are available:

- a bi-directional access offer where upstream and downstream channels both use a satellite channel
- a single direction access offer with a ground return channel using the telephone network

The prices of offers on the market and the cost of equipment have fallen significantly and are currently similar to ADSL or cable access prices at equivalent speeds.

Wireless local loop (WLL)

The wireless local loop (WLL) is a wireless technology connecting wireline subscribers equipped with an antenna, via a radio channel to an access point on Internet. Current market offers propose speeds of between 64 kbit/s and 34 Mbit/s. These are primarily solutions suited to corporate needs.

WLAN

Wireless local area networks (WLAN)[2] could in the future offer point-to-point or point-to-multipoint access services and allow high-speed wireless between users. Composed of micro-cells, these networks could provide high-speed Internet access in high-traffic public areas (called "hot spots"), such as train stations, airports, hotels, etc. Speeds vary according to the WLAN technology and can reach up to several dozen Mbit/s shared on one micro-cell.

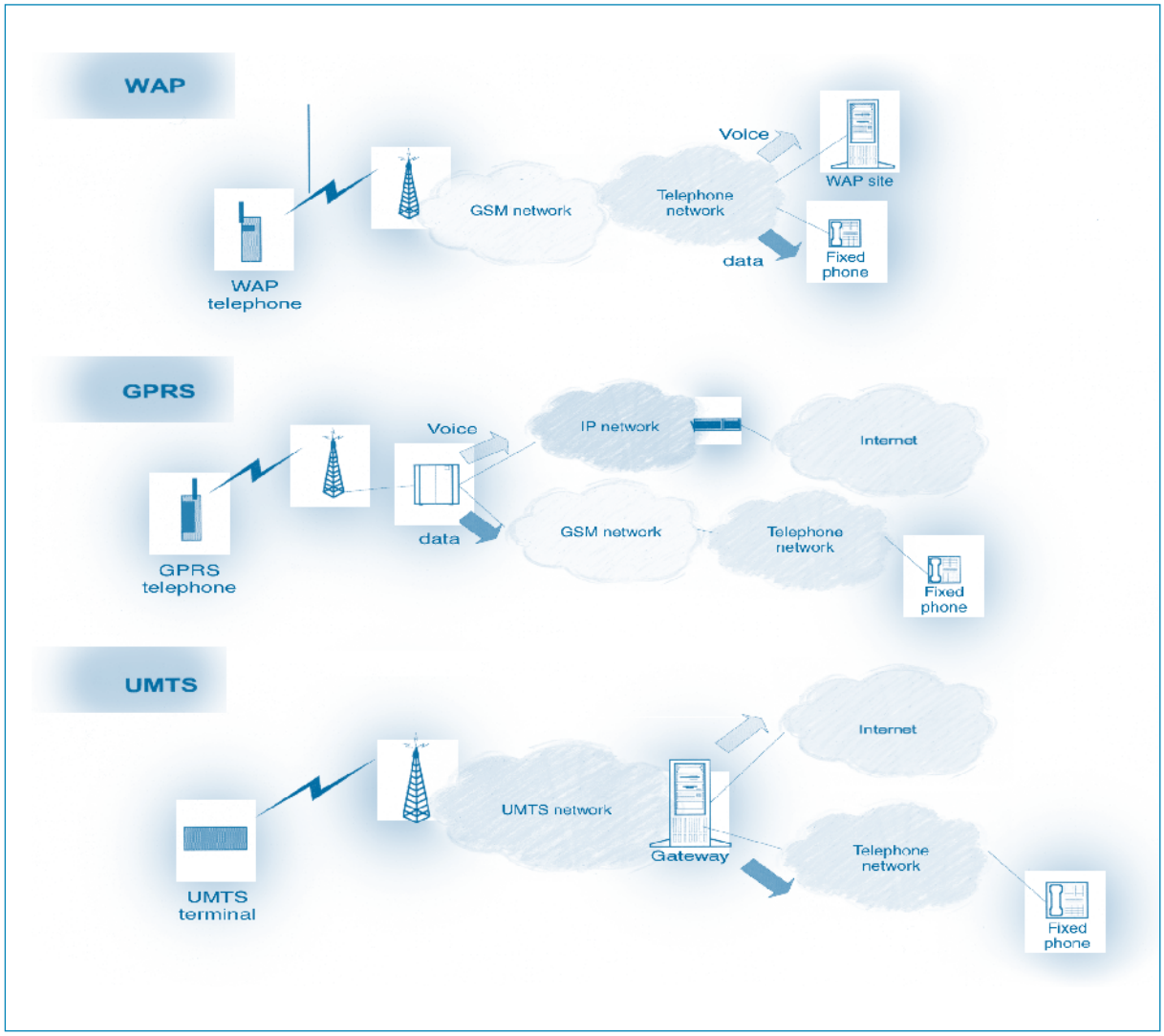
[2] Bluetooth, Home RF, Wi Fi (norme IEEE 802.11b), HiperLAN 2, etc.

1.3 Mobile Internet

The introduction of mobility is a new stage in the technological evolution of Internet access modes. Still in its infancy in Europe, this evolution should see its strongest developments in coming years. Given the 37 million GSM mobile network subscribers in France at end 2001, this market has major potential.

• Beginning in 2000 in France, WAP[3] was the first communication protocol to allow Internet connection on mobile networks using a cellular telephone equipped with this standard. However, this first attempt was a failure.

• GPRS technology, which still uses traditional GSM networks, is a packet mode data transmission standard which significantly increases available speeds. Progressively implemented by operators since late 2001, GPRS offers faster Mobile Internet access (a few dozen kbit/s), which is billed according to the volume of data transmitted from a given cellular telephone.



• UMTS is expected to progressively replace the GSM standard of early mobile telephony networks. With the construction of these new—third-generation—mobile networks, Internet access will be available at speeds of several hundred kbit/s.

[3] Wireless Application Protocol

1.4 Diversifying technical possibilities of Internet access

In the past five years, the technical possibilities of Internet access have multiplied. The list below is not exhaustive and other access modes could also be developed. For example, the electrical technology, which uses electricity networks as local loops to provide access to the subscriber, is in the experimentation phase.

These access modes do not all target the same clientele. Certain technologies are better suited to a residential clientele (peak speeds, asymmetrical, etc.), while others serve professional and corporate clients (guaranteed speeds, symmetrical, greater reliability, etc.). They lead to multiple uses and applications.

The table below presents the characteristics of the access technologies discussed above.

Technology	Downstream/upstream speed	Technical limits	Target clientele
Traditional telephone network	36.6 kbit/s	V90 57.6 kbit/s modem	Primarily residential
ADSL	Up to 8 Mb/s on the downstream channel Up to 1 Mb/s upstream	Distance subscriber / hub < 3 km	Résidentiels / TPE-SoHO
SDSL/VDSL	2 Mb/s symmetrical or even 52 Mbits for VDSL	Subscriber-hub distance < 3 km	Professional / Corporate
Fibre	Several Gbits/s depending on the multiplexing		Very larges companies
Cable	Up to 1 Mb/s on the downstream channel and 128 Kb/s upstream	Bandwidth shared by several users (no guaranteed speed)	Residential / very small companies-SOHO
Satellite	A few Mb/s on the downstream channel, upstream via telephone line or by satellite channel	Shared band, low-speed return channel, but bi-directional (satellite in both directions) is developing	Corporate
Wireless local loop	Up to x times 8 Mb/s in both directions (up to 155 Mb/s)	Customer antenna must be in the sightline of the base station, interruptions are possible (cranes, construction)	Corporate
GSM (WAP)	Up to 9.6 kbit/s	Data transmission capacity on GSM voice channels	General public Professional
GPRS	A few dozen kbit/s	Band shared by all GSM users	Initially professional, then general public
UMTS	A few hundred kbit/s	Band shared by several users	Initially professional, then general public

2 THE MARKET SITUATION

2.1 Recent economic conditions: a return to realism and market consolidation

Until 2000, Internet economic models were based, to a large degree, on broadcasting media with revenues generated primarily by advertising. This type of model reached its peak in 2000 with the so-called "free" ISPs[4] which counted primarily on advertising to cover costs: just as for television, access is free, and the station is paid for by advertising.

During this period, the number of players multiplied on each of the many "new" Internet-related markets (access, portal, e-commerce, advertising, gaming, etc.). For example, in 2000, there were several dozen ISPs in France. Based on a broadcasting model where the audience is all important, the players focussed on acquiring as many subscribers as possible.

Beginning in mid 2000, investors reduced their financing in Internet companies, primarily because advertising revenues had not reached expected levels. Fundraising and stock market listings became more difficult. This depletion of financing led to an evolution of economic models. Since advertising revenues had not reached levels which would allow financial autonomy, Internet companies could not continue to use a strategy of acquiring customers at any cost and had to find a profitable economic model.

As a result, certain formerly free services became payable, but the move from free to paid is always delicate. Now, new services (such as downloading logos or cell phone rings) must generally be paid for.

As for ISPs, they depend as much as possible on revenues generated by access, i.e. they receive part of the revenues generated by telecoms operators through Internet access traffic (see below: ART action and indirect interconnection scheme). This explains why access prices, which had fallen continuously since late 1999, have now stabilised.

At the same time, the sector concentrated. This is particularly manifest for ISPs: five ISPs currently represent 80% of active subscribers and Internet dial-up traffic (AOL, Club Internet/T-Online, Free, Tiscali and Wanadoo).

The most recent change involves the development of high-speed access. Since the pricing decisions approved by ART in April and July 2002 on ADSL and unbundling, and with the commercial launch of ADSL offers using partial unbundling, the number of high-speed accesses in France has grown strongly while the number of low-speed accesses has stagnated.

This marks a new stage in the evolution of the economic model of ISPs, which primarily acquire new subscribers with high-speed offers and which have to prepare the move of low-speed subscribers to high speed.

[4] Internet Service Provider.

2.2 Key figures for the French market

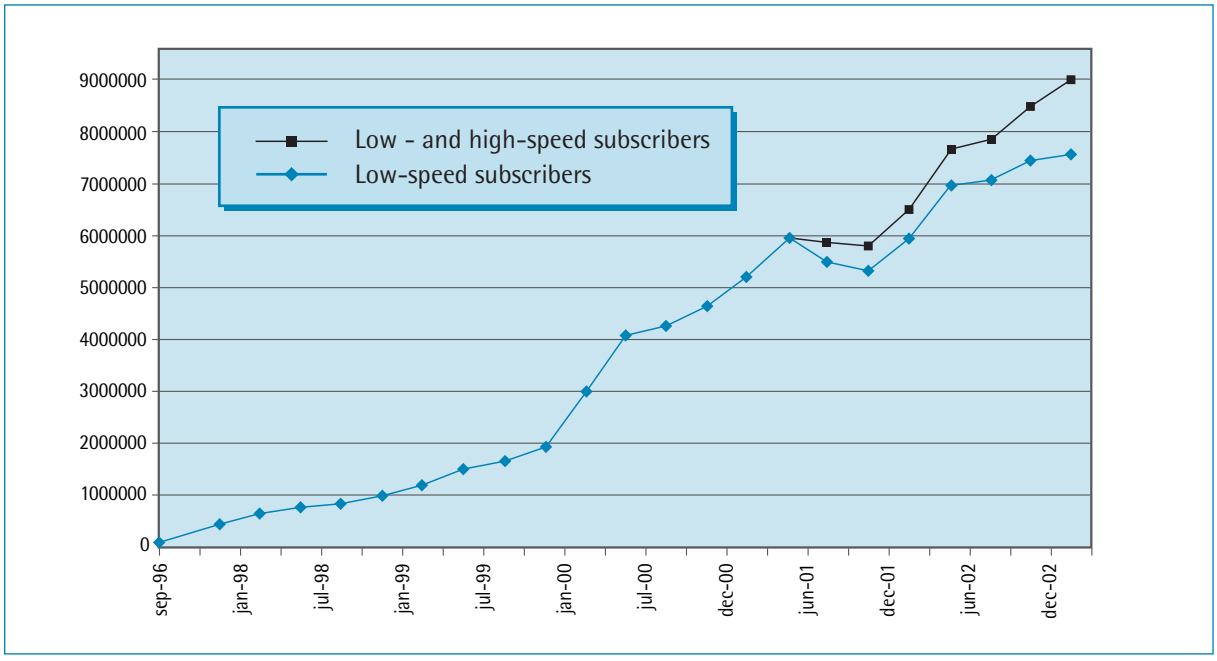
According to a number of sources (Association des fournisseurs d'accès, Association des opérateurs multi-services and France Telecom), we can estimate the number of active Internet subscriptions in France at end December 2002 at just over 9 million, an increase of 30% over 2001.

The table below shows clearly the constant and strong growth in the number of paying Internet subscribers in France, in particular the number of high-speed subscribers in 2002.

	déc - 00	déc - 01	déc - 02	Evolution 2001-2000 (%)
Bas débit	5 263 000	6 986 500	9 135 000	30 %
Haut débit	190 601	601 500	1 675 000[5]	178 %

Source: estimates according to AFA, France Telecom, Aform

The graph below shows the growth in the number of Internet subscriptions since 1996, according to AFA figures. It confirms strong growth in the number of paying Internet subscribers, which since 2002, has been driven by the growth of high speed, whereas the number of low speed subscribers appears to have levelled off.



Source AFA, Aform, France Télécom

Market growth in terms of volume and sales is also very significant:

	1998	1999	2000	2001	2002 (1st half year)
Internet sales (in millions of euros)	162.2	344.23	730.53	1 161	**560**
Internet volume (in millions of minutes)	4 976	12 617	34 957	72 729	**44 143**

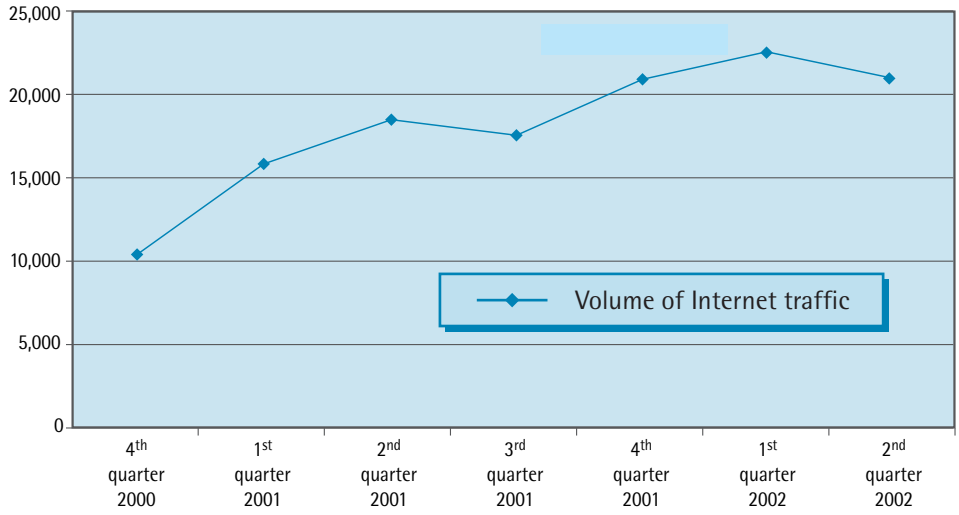
Source: ART, Market Observatory

[5] Cable assumption = 275 000 subscribers (estimated by Aform), ADSL = 1.4 million (France Telecom).

In 2001, low-speed Internet traffic represented approximately 73 billion minutes, growing by about 113% over 2000. The graph below shows a decline in traffic growth beginning the first quarter 2002, possibly caused by the highest consuming subscribers moving to high-speed access.

Volume of Internet traffic

Volume of Internet traffic

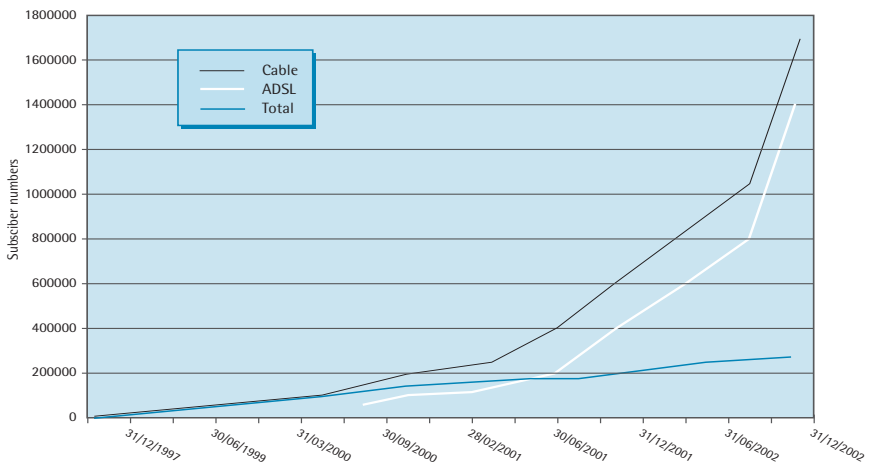


Source: Site internet de France Telecom, Relations avec les investisseurs.

The year 2002 was marked by the strong development of high speed, and ADSL in particular, with the number of high-speed subscribers multiplying by 2.5 in just one year, growing from 600 000 at end 2001 to close to 1.7 million at end 2002

High-speed subscribers now represent about 16% of active subscribers to Internet access. These figures have been strongly affected by the growth of ADSL, as shown in the graph below.

Growth of cable and ADSL



The pricing decisions of July 2002, approved by ART, on IP/ADSL offers for ISPs, had a major impact on price decreases and on the development of competition on this type of access.

Moreover, the commercial launch of unbundling in the second half of 2002 is also contributing to the strong growth of ADSL subscriber numbers in France.

Cable continues to grow at a steady rate, with Internet-on-cable subscriber numbers at 250 000 at end September 2002, for close to 48% growth in new subscribers in one year.

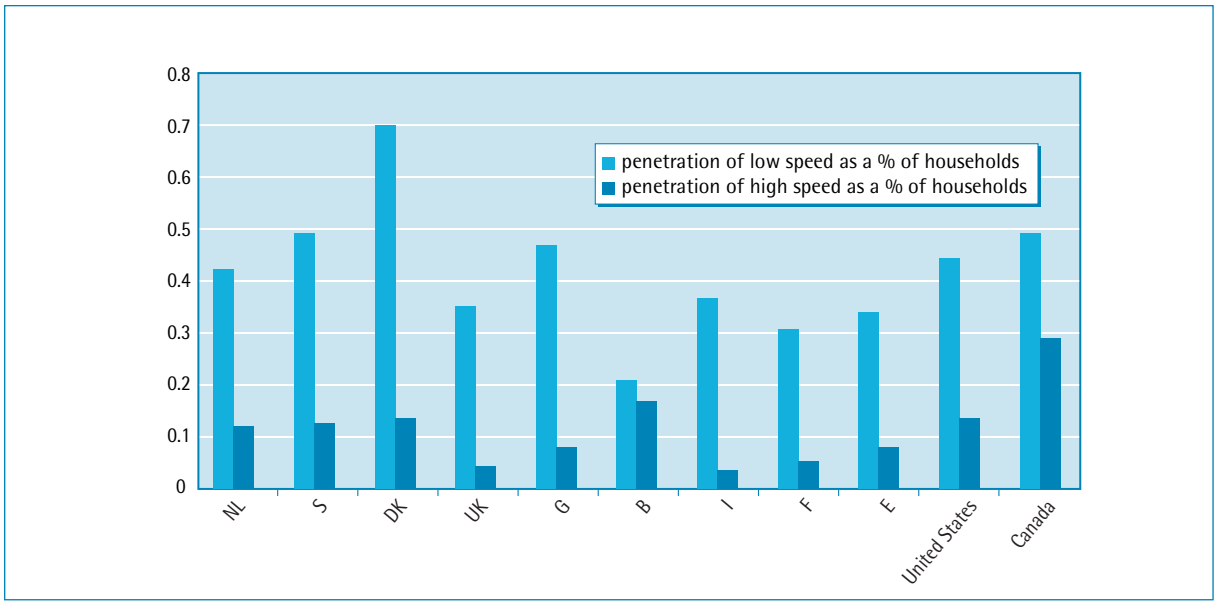
The possibilities for the provision of high-speed Internet access on cable networks are numerous, since over 600 cities in France representing 6 million outlets and over 15 million inhabitants (source AFORM) can use this type of access.

In comparison, xDSL technologies have the greatest potential for development on the residential market, because their potential in the short and long term is significantly greater than that of cable networks (we estimate that close to 80% of the population could be connected using an xDSL technology by 2003 in France).

2.3 France's position in Europe and the world

The disparities are relatively great in Europe. We can identify three groups of countries in Europe: Scandinavian countries and the Netherlands with a high proportion of households on line, then Germany, the United Kingdom and Belgium, and finally France, Italy and Spain.

Position of France in Europe and in the world



Source: CMA consulting

In Europe, Scandinavian countries reach, or even exceed the Internet penetration rate of the United States and Canada.

The situation of high speed is somewhat different. The disparities are less, but northern countries still lead the rest.

The statistics for the third quarter 2002 show France lagging behind its European neighbours. However, it is gradually gaining ground thanks to the strong growth of high-speed access which, according to AFA's latest figures, is among the highest in the world.

Still, France is clearly penalised by a lower computer penetration rate with households than other countries. This caps Internet's growth potential. At end 2001, the statistics were as follows:

Indicators	France	United Kingdom	Germany	United States
Internet penetration rate per household Q3 2002	35.6 %	39.65 %	54.58 %	61.20 %
Computer equipment rate Q1 2002	35.7 %	46 %	44.7 %	65 %

Sources: Médiamétrie, cma-consulting

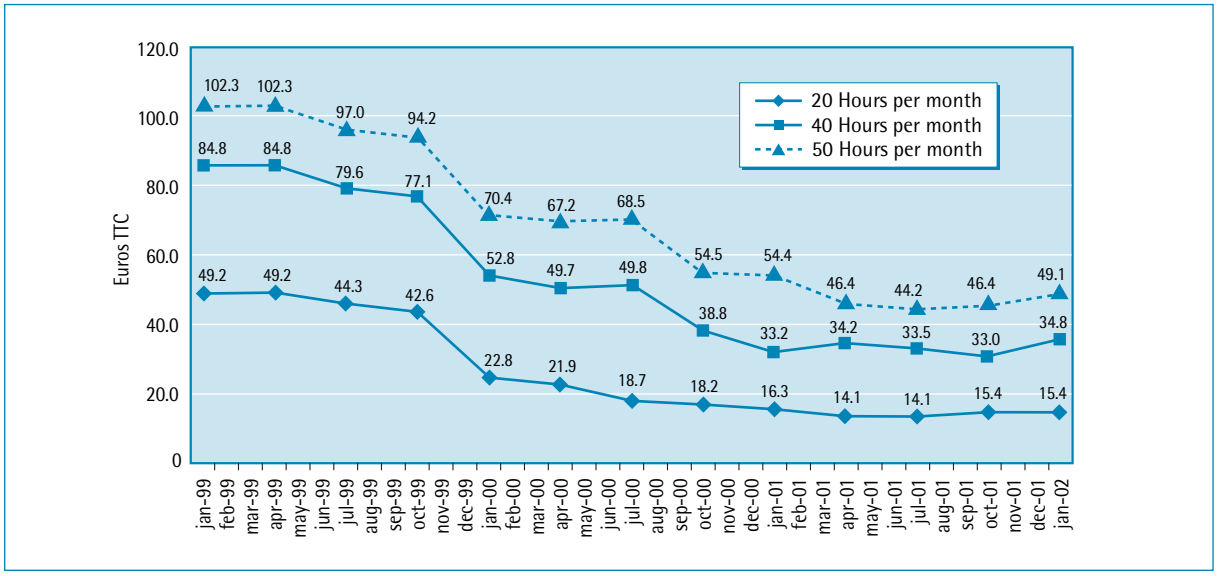
In the world, South Korea has, in the space of just a few years, become the most highly developed country in terms of Internet access, and high speed in particular. At mid 2002, 15% of the population and close to 50% of households had high-speed connections (source Idate). This penetration was encouraged in part by the government's infrastructure investment support policy.

3 DYNAMICS: EVOLUTION OF OFFERS AND PRICES

3.1 Low-speed access: prices falling constantly since 1998, now tending to stabilise

The following two graphs present changes in prices, based on the average best prices of the seven main ISPs on the residential market (Wanadoo, AOL, Club Internet, Infonie, Free, Liberty Surf-Tiscali, Orêka) for short periods (3 hours and 5 hours per month), a slightly higher average time than the monthly average of French surfers (10 hours per month) and three long periods (20 hours, 40 hours and 50 hours per month).

Change in the average best prices of the top seven consumer ISPs
(January 1999 to January 2002)



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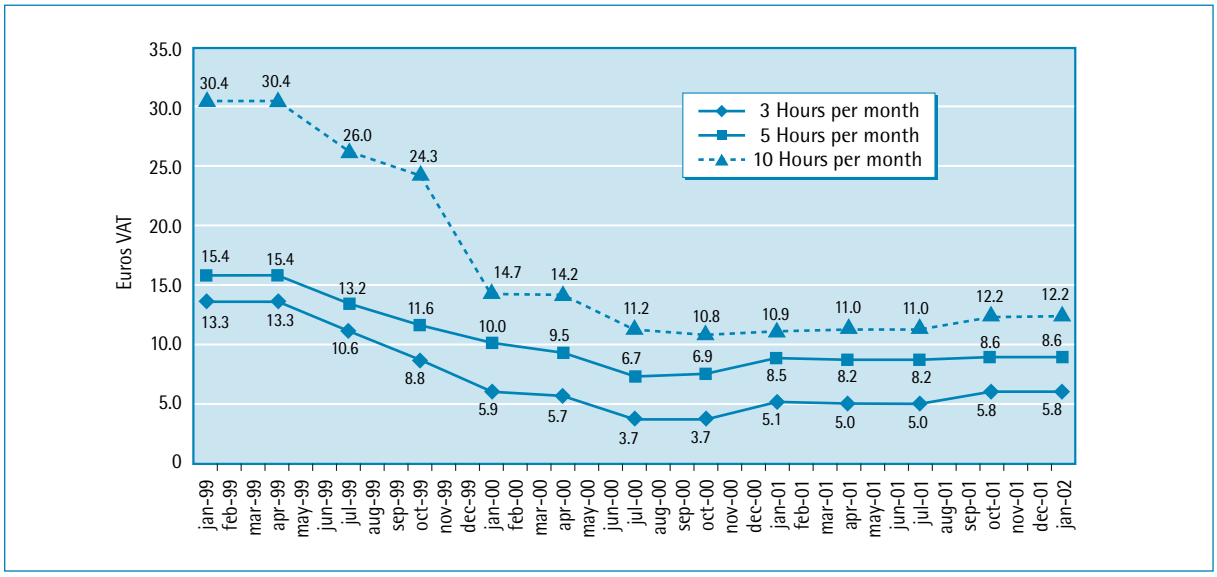


Change in Internet prices (January 1999 - January 2002)

	1999-2000	2000-2001	2001-2002	1999-2002
3 hrs/month package	- 55.6 %	-13.8 %	+ 13.6 %	*- 56.5 %*
5 hrs/month package	-35.1 %	-23.6 %	+ 12.5 %	*- 44,2 %*
10 hrs/month package	- 51.6 %	-25.9 %	+ 12.3 %	*- 59.7 %*
20 hrs/month package	- 53.6 %	-28.7 %	- 5.3 %	*- 68.7 %*
40 hrs/month package	-37.7 %	-37.3 %	- 5.0 %	*- 58.9 %*
50 hrs/month package	-31.2 %	-22.7 %	-9.6 %	*- 52.0 %*

We see that Internet access prices remained very stable from 1996 until spring 1999, with the market divided among a small number of players (Wanadoo, Club Internet, AOL and Infonie).They offered similar pricing formulas, based on a subscription paid by the surfer to the ISP and calls paid separately to France Telecom. Spring 1999 marked the start of a first wave of price decreases, with the arrival of free subscription offers (calls still had to be paid for) from ISPs like Free and Liberty Surf.

Then, beginning in autumn 1999, traditional ISPs fought back by applying their limited time flat-rate offers (including both the subscription and the call) across the board ; these offers were launched following important decisions by ART which allowed an interconnection model, called indirect interconnection (cf. below ART's action; subscribers pay a flat rate to the ISPs for a certain number of connection hours; the ISPs pays operators the Internet traffic carry costs), which was well suited to providing this type of offer.

In 2000, some ISPs launched so-called "free-free" offers with a limited amount of totally free Internet time (zero subscription, zero call cost), then a fixed cost per minute of overtime. Others (AOL, in particular) launched unlimited time offers for connection times, although these were quickly taken off the market. In late 2001, several ISPs (mainly AOL and Free) proposed "almost unlimited" packages (50 hours for ¤15 per month). These three categories of offers pulled market prices down significantly.

In summer 2002, following ART's decisions on flat-rate interconnection (cf. below ART's action), two ISPs launched unlimited or almost-unlimited connection offers.

We are now seeing prices stabilise on the retail low-speed access market, as it consolidates among a small number of players with significant market power. We are also seeing an evolution of the general economic model for Internet access.

3.2 High-speed access: offers multiply (cf. table in appendix)

In 2001, offers were primarily from cable operators and ISPs such as Wanadoo, T-Online, Tiscali, AOL, 9 Telecom, Easynet, Nérim... These companies resell DSL access, collection and transport services from France Telecom.

Today, the market price for consumer offers is around ¤45 (including tax) for an unlimited flat rate package with a peak downloading speed of 512 kbit/s. This price, within the European average, will

likely decline, although it must still allow operators to cover their costs. The consumer ADSL market is currently dominated by Wanadoo with a very significant majority market share.

ART's most recent decisions in April and July 2002 on unbundling, option 3 and France Telecom's IP/ADSL offers (option 5) had a highly positive impact on the high-speed market during the last quarter of 2002.

First, ADSL offers with downstream speeds of 128 kbits were offered by most ISPs at prices of around ¤30 per month including tax.

However, ADSL offers based on partial unbundling are the major innovation because they let ISPs truly set themselves apart from their competitors based on pricing and services.

ADSL offers with speeds of over 512 kbit/s appeared on the market beginning at €30 per month.

4 ART'S ROLE: FROM CABLE TO UMTS

Since its creation, ART's goal has been to improve the conditions of Internet access in order to let as many people as possible access Internet under the best possible conditions.

Initially, this action consisted in implementing effective competition on the access segment, i.e. on the local loop, because competition is the best tool for facilitating offer diversification and deployment, and price decreases.

Thus, on the one hand, the diversification of access modes (wireless local loop, cable networks) was facilitated, and on the other, openness to competition on France Telecom's network (interconnection for low-speed access, unbundling and its various options for DSL) was strongly encouraged.

Beyond implementing competition, ART also helped define the conditions for deploying infrastructures for new uses (mobile Internet). It also assisted the emergence of viable economic models for the provision of services on these new networks.

Its action was completed with public measures intended to extend the deployment of high speed as much as possible. In particular, ART acted as a consultant to municipal governments in facilitating the deployment of operator networks and services, typically by providing infrastructures.

4.1 Helping deploy alternative infrastructures: cable, WLL, backbones

First, ART focussed on the deployment and the provision of telecommunications services (including Internet access) on infrastructures other than those of the incumbent operator.

• In a dispute ruling in 1997, ART allowed the provision of Internet access on cable networks. Faced with confusion regarding the responsibilities of the infrastructure owner (France Telecom) and the operators (cable operators) under the Cable Plan, ART established equitable technical and financial conditions on three essential points: the operation and ownership of specific elements called "cable routers", the financing of investments required to upgrade networks, and finally the ownership of networks and the amount of remuneration owed to France Telecom by the cable operators for the use of cable networks.

Internet access via cable plays a key role in allowing competition for residential high-speed. Although available in France with geographically limited coverage, it is, for the time being, the only infrastructure competing with ADSL for the general public.

• The wireless local loop is an attractive medium for corporate Internet access. It also complements wireline technologies, which are sometimes not well suited for reaching certain areas. ART selected the operators to receive WLL licences in 2000, focussing primarily on coverage and regional development: the operators were chosen based on a series of commitments, first of which was coverage of the population and cities. In early 2002, the operators were examined to ensure they were complying with these obligations. While some operators seem to be experiencing difficulties because of economic conditions, this technology remains indispensable for competition via infrastructures.

• ART also played a role in providing a connection to global Internet from France. Given the explosion in the growth of Internet traffic, many operators, including several with global strategies,

launched the construction of pan-European backbone networks for Internet traffic carriage. Since 1998, ART has examined licence requests for more than 23 pan-European and international networks crossing France. The deployment of these networks has helped increase available capacities in France (350 Mbit/s available from France to the world in June 1998, 38.4 Gbit/s in July 2001) and in Europe, lower the price of IP carriage, and as a result improve the attractiveness of France and Europe for hosting Internet content.

4.2 Interconnecting and unbundling France Telecom's network

France Telecom's network telephone connects 34 million subscribers. Interconnection and unbundling allow third-party operators to deliver telephone subscriber traffic (interconnection), or even obtain complete control over the line connecting the subscriber (unbundling of the copper pair).

The purpose of ART's decisions and opinions has been to facilitate the development of competition among both carriers (or collection operators) and ISPs. Competition among carriers seems particularly important in that it allows competing ISPs to develop without necessarily depending on a single carrier (France Telecom). This approach is consistent with the mindset which has predominated until now in opening the telecoms sector to competition in France: competition through infrastructures in order to extend the lifespan of competition among service providers.

4.2.1 Low-speed Internet: currently used by 80% of surfers

ART pays special attention to dial-up Internet access, called low-speed Internet, because it is still used by around 85% of surfers.

Several of ART's decisions and opinions have marked and facilitated the emergence of competition for Internet traffic collection.

Background

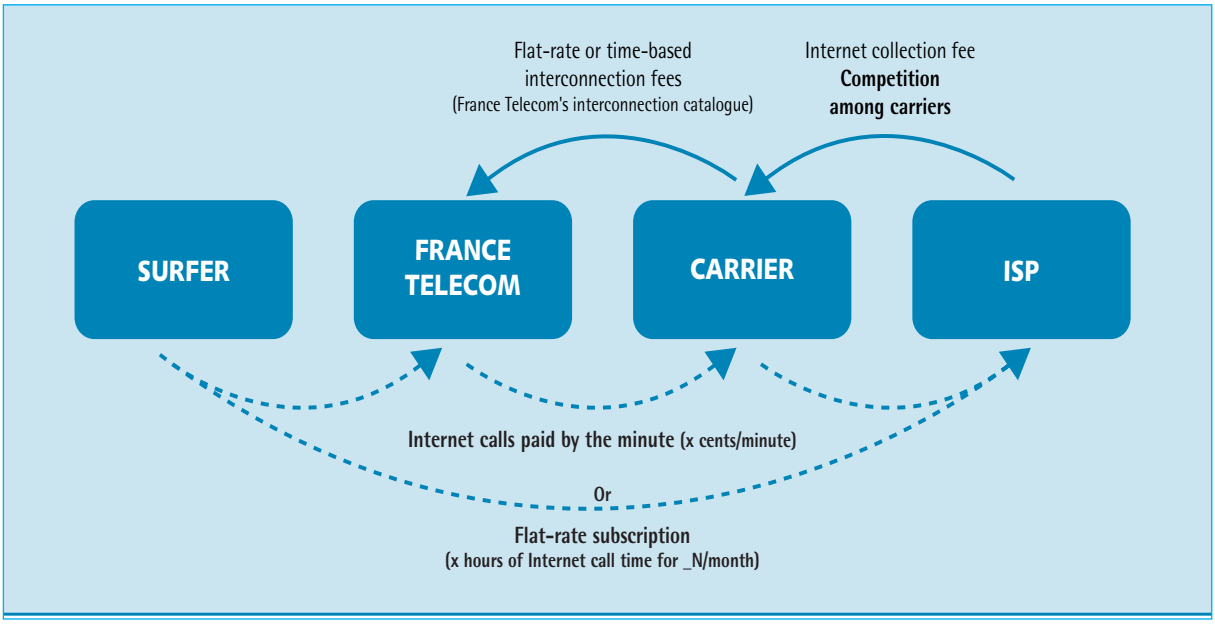
Initially, dial-up Internet access used geographic numbers, i.e. classic telephone numbers beginning with 01, 02, 03, 04 or 05.

At the time, Internet access traffic was not distinguished from classic telephone traffic in any way. The price of calls to these numbers was the same as a classic local call. Surfers paid their subscription to the ISP and their Internet telephone calls to France Telecom separately.

In late 1997, in order to meet the needs of a market which wanted to identify traffic to ISP servers in order to introduce specific pricing options for Internet calls and route them differently in the phone networks, ART assigned blocks of numbers to Internet access services, having the form 0860 PQ MCDU.

At the same time, it oversaw the implementation of an interconnection model between France Telecom and alternative operators, allowing these operators to propose collection offers to ISPs. Thus, at ART's request and following several dispute rulings, France Telecom included in its interconnection catalogue for 2000, a specific interconnection offer for Internet access traffic providing operators and ISPs with better control over the technical and economic parameters of their offers.

Indirect interconnection scheme used to establish Internet access package offers (X hours of Internet time for €N per month) or subscription-free access (payment of Internet calls by the minute)



"Indirecte" interconnexion

In this type of relationship between carriers and France Telecom, the carriers purchase an interconnection service from France Telecom: the collection of Internet traffic on its local loop. This type of scheme is called "indirect" interconnection, as opposed to "direct" interconnection, where France Telecom purchases an interconnection service from the collecting operator: this service involves treminating calls to the ISP's point of presence. In indirect interconnection:

- The ISP pays the carrier for collection and delivery to a national point of its subscribers' Internet traffic
- The operator pays France Telecom interconnection charges for collection on France Telecom's local loop of the ISP's subscribers' Internet traffic
- The subsciber pays either a fixed price (€X for N connection hours per month) directly to the ISP, or the Internet calls to France Telecom which pays back the ISP via the carrier

Following these decisions, the number of Internet access packages including a specific amount of connection time grew in 2000 and 2001, at lower and lower prices. As a result, thanks to competition, France Telecom proposed a decrease in the average price of Internet calls in January 2001 (Opinion no. 01-165 dated 9 February 2001).

New in 2001: flat-rate Internet interconnection, a spectacular decline in collection costs

Classic time-based interconnection is composed of fixed charges for the provision of a number of interconnection circuits[6], call origination charges and charges by the minute. In flat-rate Internet

[6] Per range of 30 circuits: one primary digital block (2 Mbit/s or 30 64 kbit/s circuits).

interconnection, interconnection is paid on a flat-rate basis: a fixed amount for a certain number of interconnection circuits, regardless of the way in which the operators fill them.

Following discussions led by ART in late 2000 and early 2001, France Telecom proposed a flat-rate Internet interconnection offer to take effect in September 2001. In November 2001, flat-rate Internet interconnection was included in France Telecom's interconnection catalogue for 2002.

As a result of flat-rate Internet interconnection, dial-up Internet collection prices for ISPs were lowered by up to 30% in 2001. Several ISPs offered long-time low-cost packages (50 hours per month for ¤15) and the first so-called "unlimited" packages were launched in summer 2002. In a delicate economic and financial period, flat-rate Internet interconnection should have a positive impact on the balance sheets of operators and ISPs by lowering Internet traffic collection costs. An improvement in the economic model of ISPs on low speed is important at a time where players have to invest in the emerging high-speed market, and ADSL in particular.

Low-speed Internet access and universal service

Today Internet calls help finance universal telecommunications service through a charge paid by the collection operator for each Internet minute carried. However, with the drop in the price and collection costs of Internet traffic (in particular with the implementation of flat-rate Internet interconnection), this charge is becoming more and more difficult for ISPs and operators collecting Internet traffic to bear: €0.013 per minute in a market where an Internet minute is now sold for just ¤0.105, adding a 15% surcharge on the traffic collection costs.
In this context, ART favours a change to the law in order to bring the universal service contribution per minute of Internet calls to a more reasonable level

4.2.2 Competition on DSL: issues for 2002

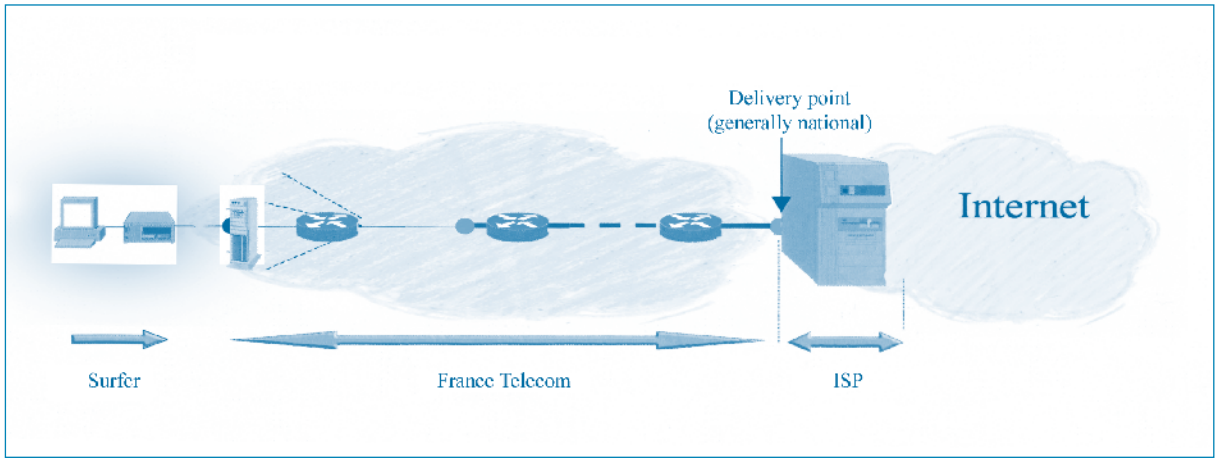
ADSL is a fast means of developing high speed because it is deployed on the classic telephone network, an existing infrastructure covering the entire territory. Still, ART is convinced that, in order to last, such a development requires effective competition to lower prices, and encourage innovation and offer diversification.

- *ADSL access options*

Three solutions can be used to allow ISPs to build ADSL Internet access offers:

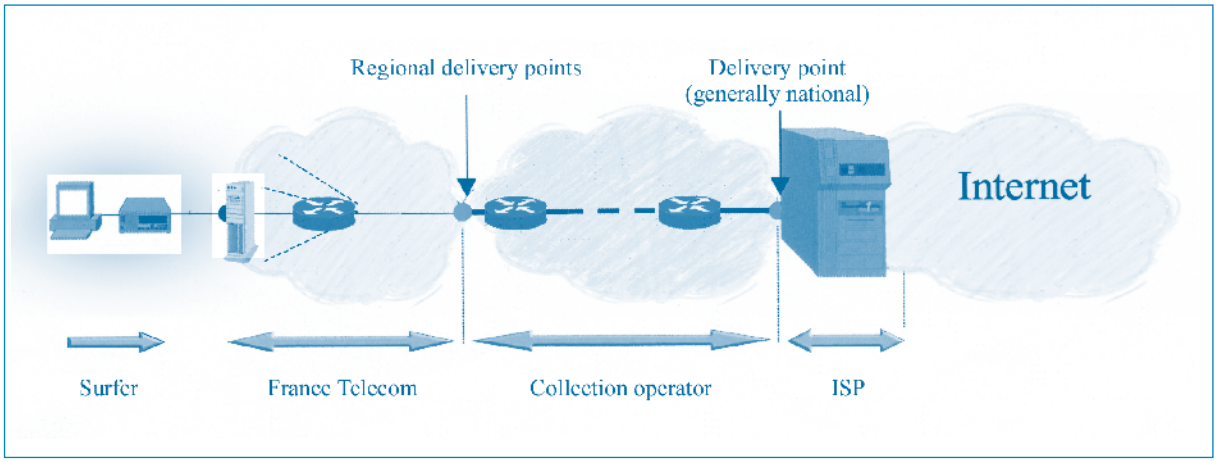
1) (Option 5) Traffic from the ADSL subscribers is delivered directly to ISPs' servers by France Telecom. The ISPs depends totally on France Telecom for access and all collection.

Access and DSL traffic collection by France Telecom *(option 5)*



2) (Option 3) Operators buy a DSL traffic collection service on France Telecom's local loop and resell a global ADSL access and collection service to ISPs. ADSL subscriber traffic is delivered by France Telecom to a carrier at the regional level (40 delivery points). This carrier then extends collection to the ISPs' servers. ISPs are independent of France Telecom for part of collection allowing them to better distinguish their prices and quality of service (bandwidth per subscriber).

DSL traffic carriage by a third-party operator *(option 3)*

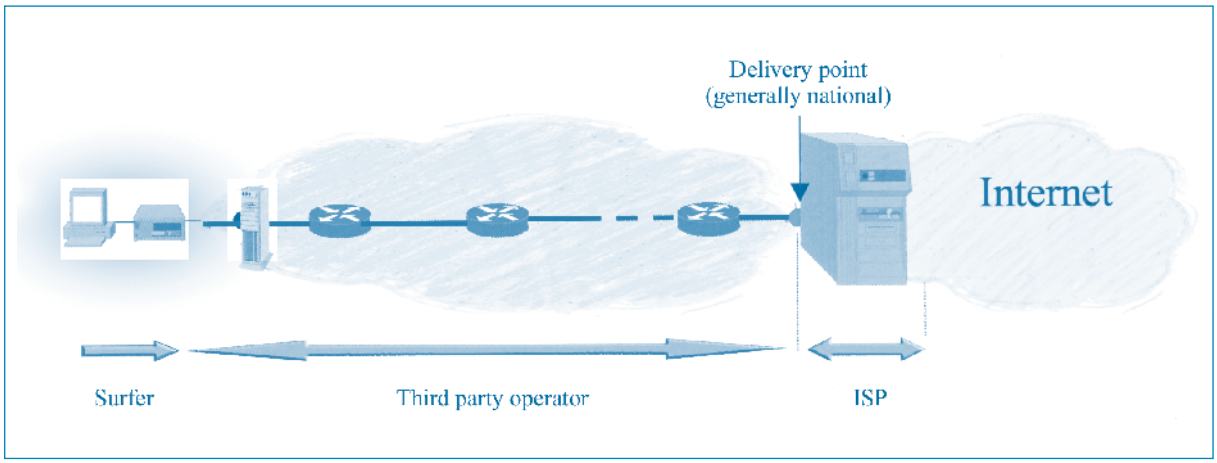


3) (Option 1) France Telecom provides operators with the local loop on its network, according to two modes: full unbundled access, involving the provision of the bare copper pair, which lets operators provide all types of services, and partial unbundled access, providing high frequencies on the copper pair, for the provision of Internet services.

Under unbundling, competing operators deploy their infrastructure and install their technical equipment on France Telecom cross connects. Given the number of sites required for national coverage (12 000 cross connects in all), unbundling will cover the most densely populated areas, at least in the short term, with the rest of the country covered using option 3.

The financial and operational conditions of unbundling in 2001 were not conducive to its launch. Moreover, modifications to the pricing offer imposed by an ART decision in April 2002 are too recent to have had an impact on the number of unbundled lines (756 in July 2002).

DSL access and traffic carriage by a third-party operator *(option 1 - local loop unbundling)*



• *April and July 2002: ART's most recent decisions on opening the consumer DSL market to competition*

Wanadoo currently controls a large majority share of the consumer ADSL market and France Telecom has almost 100% market share for the collection of ADSL traffic. This situation results primarily from the fact that, unlike Wanadoo and France Telecom, ISPs and competing operators cannot currently operate on the ADSL market—and the consumer market in particular—under economically viable conditions. Because of this, ART took three major decisions in April and July 2002 in order to implement effective competition on the ADSL market. These decisions affect the three schemes described above (options 1, 3 and 5).

For unbundling (option 1), ART's decisions modify France Telecom's reference offer in pricing and operational terms as of 2 May 2002. In particular:

• The rental fee for the copper pair and service charges have been lowered by close to 30%, and the rental fee for shared access (high frequencies on the copper pair) has been more than cut in half and now includes a traffic filtering service (separation of telephone traffic and Internet traffic).

• In terms of operational conditions, ART's decision makes major strides affecting both collocation conditions[7] for operators on France Telecom sites and on the order and delivery systems for unbundled pairs. As regards collocation, the decision requires that France Telecom allow operators to install their equipment in existing rooms containing France Telecom equipment in which there is available space, on all its sites where no firm order has yet been placed for a specific collocation room.

[7] Installation of operators' technical equipment inside France Telecom's buildings.

• Concerning the ordering and delivery of unbundled pairs, the decision clarifies the conditions for implementing the principle of non-discrimination between the incumbent operator and third-party operators, requiring France Telecom to measure and publish average order processing times, and preventing it from imposing on operators certain expenses in situations which cannot yet be properly anticipated or controlled at the initial stage of unbundling.

The aim of all these modifications is to give true impetus to the unbundling process in larger areas of the country, and to make possible its extension to residential customers. France Telecom published a new reference offer conforming with ART's decision in June 2002.

Unbundling reference offer	Prices as of july 2001	Prices as of june 2002	% change
Full unbundling access (monthly)	€14.5	10.5	-28%
Shared access (monthly)	€6.1 + filtre sur devis	2.86 y compris la prestation de filtrage	
Access charge	€107.9	€78.7	- 27%

In spring 2002, France Telecom publicly announced technical and pricing modifications to its ADSL access and collection offers (option 5) and submitted them for ART's opinion. ART examined France Telecom's proposals with an eye to creating an overall competitive balance among the players on the consumer ADSL market, in particular with respect to France Telecom. This balance must exist for both ISPs and operators:

• ISPs must be able to propose ADSL subscriptions which compete with Wanadoo under conditions of fair and economically viable competition.

• Under either option 1 (unbundling) or option 3 (DSL traffic collection service by France Telecom on its local loop) operators must be able to propose ISPs ADSL traffic collection offers which can compete with those proposed by France Telecom (option 5).

In April 2002, ART's goal of creating competition on the ADSL market led it to issue an unfavourable opinion of France Telecom's proposals, because they were not compatible with establishing competition between France Telecom and operators on ADSL access and carriage.

Following this opinion, France Telecom submitted new pricing proposals for its IP/ADSL offers to ISPs. ART approved these on 18 July 2002.

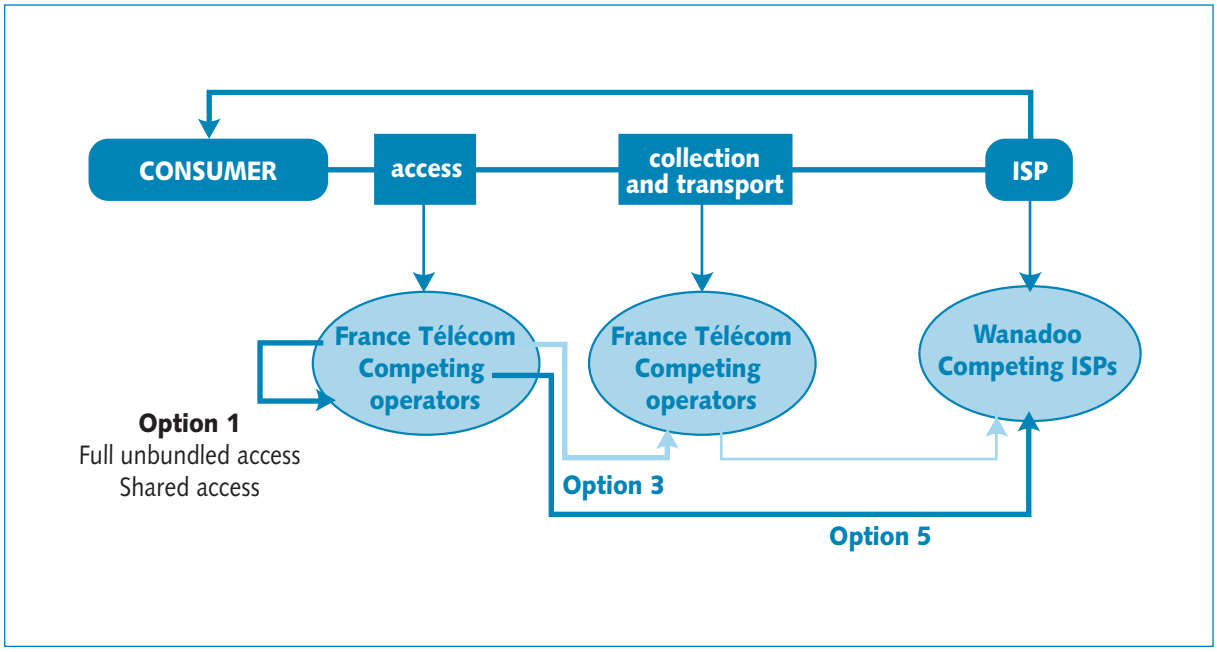
France Telecom has lowered the prices for its offers intended for ISPs (option 5) by an average 25%, and those for operators (option 3) by 40% on average.

These measures significantly improve the circumstances of ISPs on the ADSL market, as well as of operators wishing to operate concretely on this market by proposing alternative offers to France Telecom's.

Operators will be able to compete with France Telecom on ADSL traffic collection offers primarily by benefiting from an expanded range of speeds, in a comparable manner. A so-called "differentiated" option 3 offer adjusts the price according to the range of speeds offered by France Telecom to ISPs.
ART's decisions of July 2002 finalise the establishment of a complete and coherent system which significantly improves the circumstances of ISPs and, makes competition possible for operators wishing to take advantage of the complementary nature of option 3 and unbundling.

These decisions are based on a global approach to the ADSL value chain allowing ISPs to compete on each of the three segments: access, collection and carriage and service.

The diagram below shows that these three services are interdependent. ART's decisions allow a balanced sharing of value, so that ISPs can launch offers competing with France Telecom on each of these markets.



In order to prevent a delay which would make these changes inoperable, and to allow operators to launch their offers at the same time as France Telecom, ART set 15 October 2002 as the application date for the technical and financial conditions of these new offers.

ADSL offers to the end customer	Prices before july 2002 (VAT incl.)	Proposed price as of july 2002 (VAT incl.)	Change with respect to current prices
ADSL 128 line	N/A	€16	
ADSL 512 line	€30	€25	- 17%
ADSL 1024 line	N/A	€51	
ADSL pro 1024 line	€90	€67	- 26%

Option 5

IP/ADSL access offers	Prices before july 2002 (excl. VAT)	Proposed price as of july 2002 (excl. VAT)	Change with respect to current prices
IP/ ADSL 128	N/A	€11.6	
IP/ ADSL 512	€21.3	€15.5	- 27%
IP/ ADSL 1024	N/A	€37.1	
IP/ADSL pro 1024	€76.5	€58.2	- 24%

Service access charges remain unchanged at €53 per access for all offers, excluding VAT and installation on the subscriber's premises.

Option 3

Operator offer	Prices before july 2002 (excl. VAT)	Proposed price as of july 2002 (excl. VAT)	Change with respect to current prices
Standard option 3	€42.20	€23	- 40 %
differentiated Option 3	N/A	128 kits/s = €16.6 512 kbits/s = €21 1024 kbits/s = €44.5 1024 kbits/s pro = €65.6	

Impact on ISPs

These pricing decisions will significantly lower the costs borne by ISPs.

IP/ADSL	IP/ADSL access offers	IP/ADSL collection (access fee included)	Total (excl. VAT) per month per subscriber
IP/ ADSL 128	€13.10	€9.90	€23.00
IP/ ADSL 512	€17.00	€11.00	€28.00
IP/ ADSL 1024	€38.50	€16.20	€54.70
IP/ADSL pro 1024	€59.70	€16.20	€75.90

• *ADSL modems*

In addition to pricing and operational constraints for access to France Telecom's network, the development of competition and the ADSL market are also impeded by technical barriers. In December 2001, ART removed one of these when it adopted a decision allowing operators and ISPs to choose the ADSL modems they use to connect the subscriber to France Telecom's network.

One of the major components of the development of ADSL access resides in the ADSL modems that subscribers are required to use.
ADSL technology has not yet reached a stage of maturity equal to that of dial-up access where the interoperability of modems with the network no longer poses a problem. Because the interoperability of ADSL modems with the network is not as well established, France Telecom allowed ISPs to connect only a small number of types of ADSL modems, which it itself had tested and referenced. This situation held back competition on the ADSL modem market and prevented any price decreases.

In a complaint submitted by Tiscali at end 2001, ART requested that France Telecom allow ISPs to freely choose the modems they sold and prepare an open and transparent referencing procedure for modems in order to check their interoperability with its network.

France Telecom modified its framework contract with ISPs, adding the freedom to choose a modem. ART also asked that the referencing procedure for new modems be open not only to ISPs but also to manufacturers.

ART now awaits rapid implementation of the interoperability verification procedure between new ADSL modems and the France Telecom network. This is a positive point for competition between ADSL modems, and leads us to expect a price decrease for these devices, which will benefit end consumers.

A working group composed of modem manufacturers, DSLAM manufacturers, operators and ISPs has been formed to monitor the development of modem-DSLAM interoperability issues.

4.3 Creating the conditions for the development of Mobile Internet

The introduction of mobility in Internet access and the evolution of mobile networks towards third generation is another major area on which ART has been working.

In this area, ART's first aim was to create conditions which facilitated the deployment of third-generation mobile networks. This is why it lobbied right from the start in favour of a license application procedure rather than an auction. In 2001, it defended a revision of the conditions of license attribution (price, duration). In accordance with its proposals, ART finally examined the applications for UMTS based on the commitments of operators on various criteria, in particular on population coverage.

ART also supported the development of viable economic models for Mobile Internet. Throughout 2000, as WAP was launched, ART dealt with the issue of relations between mobile operators and third-party service providers[8]. After organising discussions, it published its recommendations allowing players on all the links of the value chain to operate within an open and competitive framework. As Mobile Internet (GPRS, UMTS) changes in the future, ART may need to intervene again to facilitate the creation of economic models and principles to guide the players (mobile operators, service providers, content publishes) on the value chain.

[8] In particular, the issue of Wap locking, where mobile operators lock the terminals to a preselected service package.