

French Consultation Document

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Public consultation

Providing telecommunications services over frequencies not specifically assigned to their user in the 2.4 GHz and 5 GHz bands (WLAN)

How the public consultation works

Overview

Wireless local area networks (WLAN) use frequencies that are not specifically assigned to their user, with no guarantee of protection or non-interference. These WLANs potentially offer point-to-point or point-to-multipoint access services and allow high-speed wireless communications between users. Their use is largely restricted to private networks within the European Union.

The possibility of using these frequencies to provide telecommunications services to the public is currently being examined and has already been planned in other European countries. ART has already received a number of requests for information on this subject from the industry, consultants and operators in recent months.

International standards

There are three categories of WLAN application:

- ?? Low-powered, short-range radio installations defined in decision CEPT/ERC/DEC/(01)05 of the Conference on European Post and Telecommunications (CEPT), regarding the use of low-powered, short_range non-specific devices operating in the 2400-2483.5 MHz band. This decision refers to standard EN 300-440 of the European Telecommunications Standardisation Institute (ETSI) or to the harmonised standard replacing it or to any other recognised equivalent standard.
- ?? Wireless local area networks (WLAN) defined in CEPT decision CEPT/ERC/DEC/(01)07 regarding the use low-powered, short range devices for wireless local area networks operating in the 2400 –2483.5 MHz frequency band. This decision refers to ETSI harmonised standard EN 300 328-2 or to any other recognised equivalent standard.
- ?? High performance LANs (hiperLANs) defined in decisions ERC/DEC/(96)03 and ERC/DEC/(99)23 regarding harmonised frequency bands to be designated for the introduction of high-performance wireless LANs. These decisions refer to the ETSI standard ETS 300 836 or to the harmonised standard replacing it or to any other recognised equivalent standard.

Abovementioned decisions ERC/DEC/(96)03 and ERC/DEC/(99)23 cover two types of networks: one including frequency selection and power control measures and the other without such measures, for which only the 5150-5250 MHz band is allocated.

The French regulatory framework

At the national level, frequency attributions and conditions of use of WLANs are defined by several ART decisions (included in the annex):

- low-powered, short range radio installations;
ART decisions nos. 2001-442 and 2001-443 dated 2 May 2001
- wireless local area networks in the 2.4 GHz band;
ART decisions nos. 2001-479 and 2001-480 dated 23 May 2001
- high performance wireless local area networks in the 5 GHz band;
ART decisions nos. 2001-441 and 2001-440 dated 2 May 2001

Purpose of the consultation

In its concern to take into account the interests of players on this subject, the long-term stakes for the telecommunications sector and the many concerns raised by the development of WLAN networks, ART began discussions on this question and on its regulatory consequences.

ART invites all sector players and users to contribute by sharing their views on:

- the evolution of demand and the scope of this evolution
- technical problems
- measures which could be taken by public authorities on this subject

The different perceptions of medium- and long-term considerations justify an extensive debate in order to collect the opinions and analysis of all players in the telecommunications, information technology, services and multimedia sectors concerned by this question as well as users.

Organisation of the document and submission of contributions

In order to facilitate the processing of contributions, each of the major topics discussed is followed by a numbered list of questions, which is neither exhaustive nor limiting. Contributions may deal with one or more topics and players wishing to comment on points which have not been identified are invited to do so.

Respondents must stipulate whether all or part of the documents sent are confidential. Any commercial secrets should be referenced in confidential annexes.

Practical information

Contributions must be sent by 15 February 2002 by mail, fax or e-mail:

- mail:

Autorité de régulation des télécommunications
Service Opérateurs et Ressources
7, square Max Hymans
75730 Paris Cedex 15

- fax:

Autorité de régulation des télécommunications
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Fax: 01 40 47 71 97

- e-mail:

with the subject: "*Réponse à la consultation publique RLAN*"
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Information

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This document is available for downloading from ART's Web site: www.art-telecom.fr

1 The problem regarding the use of WLANs in France

1.1 WLANs in France today

1.1.1 Current regulatory framework

The public consultation covers the frequency bands in the table below.

- Applicable framework for the use of frequencies -

Allocated frequency band	Conditions indoors	Conditions outdoors
2400 – 2483,5 MHz	effective isotropic radiated power < 10 mW	effective isotropic radiated power < 2.5 mW
2446,5 – 2483,5 MHz	effective isotropic radiated power < 100 mW	On private property, with prior authorisation, effective isotropic radiated power < 100mW
5150-5250 MHz	effective isotropic radiated power < 200 mW	Not allowed
5250-5350 MHz	effective isotropic radiated power < 200 mW Frequency selection mechanism depends on channel availability Mean power attenuation transmitted > 3dB	Not allowed
5470 – 5725 MHz	Under examination	Under examination

As regards ART decisions, only those texts published in the hard copy of the *Journal Officiel* are valid

The details of the conditions of use appear in the ART decisions in the annex.

The agreement between the Ministry of Defence—which is the past and current user of the band—and ART states that the 2400-2483.5 MHz frequency band will be made available for equipment with an effective isotropic radiated power of 100 mW inside buildings and 10 mW outside the buildings beginning 1 January 2004.

The current regulatory framework restricts the use of these frequency bands to private networks: private networks of legal entities (companies, associations, universities), residential indoor networks, etc.

1.1.2 - Networks and services available within this framework

The authorisation and usage conditions of WLAN technologies are not identical in all countries. In particular, French regulations are more restrictive than most other European countries. Therefore, some equipment may not be suitable within the French regulatory framework and therefore will determine the uses and services that can be provided.

Q1.1 Can the equipment available on the market be used in accordance with applicable French legislation?

Q1.2 Which of the equipment currently available conforms with the French regulatory framework?

1.1.3 - Prospects in the framework of private wireless networks

Created on the initiative of a number of people in June 2000 in Seattle, the Seattle Wireless network now has several hundred relay antennae around that city, and provides a high-speed wireless network at no cost, freely accessible to anyone with a computer. This MAN (Metropolitan Area Network) operates under standard IEEE 802.11b (WI-FI) in the 2.4 GHz frequency band, which is free in the United States. While not necessarily connected to Internet, this network allows users in its coverage area to play games, share pictures and videos with family and friends. A number of similar networks are in the project stage in several European countries.

Q2.1 To what degree could the non-commercial sector use WLAN technologies: so-called co-operative or community networks (non-commercial use open to the public) in particular with respect to private corporate networks uses?

Q2.2 To what degree could the development of these so-called co-operative or community networks (non-commercial use open to the public) co-exist without hampering the operation of independent commercial and public networks (businesses, municipalities, university, school, etc.)?

1.2 Development of services to the public

1.2.1 Potential use of WLANs

Several European countries, including Germany, Luxembourg, Italy, the UK, the Netherlands and Austria, have considered this subject. Ireland closed a consultation on this subject in September 2001.

The French framework (*cf. above*) has a number of specific requirements regarding the conditions of use.

Q3. To what degree can projects based on providing telecommunications services to the public fit into current restrictions with regard to both power and location of use?

ART has also received several requests for information from industry, consultants and public network operators in recent months. Planned applications most often cover Internet access services in high-traffic and dense zones: airports, conference rooms, hotels, restaurants, etc.

Q4.1 What services could be provided to the public using WLAN technologies? Within what timeframe?

Q4.2 (Operators) Would you be interested in providing telecommunications services to the public in these frequency bands? If yes:

- for what types of services in particular?
- using what technology?
- applying what prices?
- with what cost structure?

Q4.3 (Users) Would you be interested in service offers developed using these WLAN technologies? If yes,:

- using what technology?
- within what timeframe?
- at what scale (local vs. national services)?
- with what service quality?
- at what price?

Depending on the services offered and the targeted clientele, we can foresee a number of directions of development of WLANs, both from the point of view of geographic deployment and in coordination with other networks.

Q5. What coverage strategies could be considered in deploying WLAN technologies?

1.2.2 Experience with WLANs in other countries

The experiences in the United States with WLAN technologies used to provide fixed Internet access services to the general public have shown their limits. A number of ISPs having chosen this technological solution have been forced out of the market because of a lack of profits.

Q6. What would be a viable economic model, given the experiences in other countries in using WLAN technologies to provide telecommunications services to the public?

Several companies in the United States and Sweden have developed services focussing on airport and train station uses, based on flat-rate billing on a yearly basis.

Q7. How could invoicing and authentication be done in order to provide telecommunications services to the public using WLAN technologies?

1.3 Impact of developing services on other networks

1.3.1 Impact on private networks

Because these are frequencies not specifically assigned to their user, which have no protection or non-interference guarantee, it is possible that congestion and saturation may be experienced to varying degrees, in some geographic areas.

Q8.1 To what degree would the massive development of a service offer to the public using WLAN technologies significantly affect the proper operation of currently authorised applications (L.33-3) (e.g. private networks or private corporate networks)?

Q8.2 What consequences can be foreseen for the markets of equipment, networks and services of internal and private networks if WLANs were used to provide public telecommunications services?

1.3.2 Impact on non-mobile networks

Many technologies are currently both competing and complementary in order to provide the end consumer with access to high-speed telecommunications services: such as the powerline technologies used on the low-voltage electric networks, still in its infancy in France, the wireless local loop (WLL) currently in the development phase, unbundling of France Telecom's local loop (xDSL services) which is being put in place and more traditional technologies, such as cable networks, and satellite dishes.

Q9.1 If WLAN technologies were to be used to provide telecommunications services to the public, to what degree could WLAN networks and associated services complement or compete with other available and expected technologies on the fixed local loop (fibre, cable, xDSL, powerline technologies, WLL, satellite, etc.) and associated services?

Q9.2 What impact could the development of WLAN technologies for public access have on the development of current and future technologies on the fixed local loop?

1.3.3 Impact on mobile services

Once WLAN deployment is sufficiently broad and covers a large enough number of strategic zones with high traffic potential such as airports, train stations and business centres, it represents a partial alternative to 3G networks to route the traffic of mobile clients in these zones. Thus, it is important to determine to what degree this alternative is an opportunity for the mobile service market, or a threat to the long-term development of this market.

Q10.1 To what degree could networks using WLAN technologies and associated services complement or compete with GSM/GPRS and UMTS networks and mobile services?

Q10.2 What impact could the development of WLANs have on the development of third-generation mobile networks?

Q10.3 What are the potential risks of WLAN destabilising the 3G market?

1.3.4 The timing of a change to the authorised use of WLAN technologies

Given current concerns and growing interest in the sector for WLAN technologies, it may be appropriate to examine a change to the current applicable framework, at least as regards the types of uses. It is important to remember that, under the national frequency allocation table, the use of these frequency bands is already restricted to mobile services (as defined by radiocommunications regulations), which excludes the use, for example, of radio relay links in these bands.

Q11. In your opinion, is it time to limit the use of these frequency bands to certain uses? If yes, to which ones?

For further consideration:

Q12.1 In your opinion, is it time to allow the use of wireless local area network technologies using frequencies not specifically assigned to their user to provide telecommunications services to the public?

Q12.2 In your opinion, could we limit the public provision of these telecommunications services to applications strictly restricted to inside buildings?

Q12.3 If WLAN technologies were to be used to provide telecommunications services to the public, should the licences L.33-1 delivered to operators providing services to the public on these frequency bands include service restrictions (dedicated to fixed or mobile) or allow operators to decide (in the framework of the restrictions of the national frequency allocation table)?

2 Difficulties related to the technology

2.1 Interoperability with existing networks

In early October 2001, a research and development laboratory announced that it had developed software which allows 3G products to communicate with each other, regardless of the technology they use: CDMA2000, UMTS (Universal Mobile Telecommunications Services), high-speed WLAN technologies, or standard IEEE 802.11.

Q13.1 To what degree is it foreseeable to interconnect WLAN networks with fixed switched networks (switched telephone network, wireless local loop, cable networks, etc.) and, under what interoperability conditions? What then would the probable timeframe be, concretely, (first services marketed)? Is such interoperability foreseeable?

Q13.2 To what degree is it foreseeable to interconnect WLAN networks with 2nd generation (GSM) or 3rd generation mobile networks (e.g. UMTS.) and, under what interoperability conditions? What would then be the probable timeframe be for equipments allowing this interoperability to be available and for the first services based on them to be marketed ?

Q13.3 Within what timeframe would it be possible to have GSM/GPRS/UMTS terminals allowing radio access to a WLAN?

2.2 WLAN security

WLAN technologies do not seem secure at this time. The encryption tools used to secure networks used in WLAN technologies seem easy to break. Many publications and specialised magazines have shown in the past several months how easy it is to bypass and could even describe the encrypting keys.

Q14 To what degree can the evolution of the encryption technologies and protocols used on the WLAN anticipate real security of data? If such an evolution is foreseeable, what would the probable timeframe be, technically then concretely (generalised use)?

Moreover, certain WLAN access points have structural faults and could be used by third parties to easily retrieve an IP address and gain access to all or part of the network. These faults have also been identified by several specialised magazines which explain how to break them.

Q15. Is it possible to foresee increased security for WLANs against intrusions? If yes, within what probable timeframe, technically, then concretely (generalised use)?

Under the obligations in the specifications included in the licence under article L. 33-1 of the Post and Telecommunications Code, operators of a public telecommunications network are required to take necessary measures to guarantee the protection, integrity and confidentiality of the data they hold and process (article D. 98-1 of the Post and Telecommunications Code).

Q16. Beyond this obligation which is imposed when an operator provides telecommunications services to the public, how could users be informed of the potential risks inherent to this type of network?

2.3 Quality of service

Depending on the configurations and the standards used, the quality of service provided and perceived by users can vary significantly.

Q17.1 What are the guarantees and/or the limits of WLAN technologies in terms of service quality?

Q17.2. How reliable are telecommunication services supported by WLAN technologies, depending on the standards used (Bluetooth, HomeRF, HipeWLAN1 and 2, etc.) with regard to the following factors, in particular:

- permanence of service
- availability rate
- end-to-end error rate
- speed experienced by the user, etc.

Under the obligations in the specifications included in their licence, operators of public telecommunications networks are required to take necessary measures to:

- guarantee permanent and continuous operation of the network
- remedy any effects of system defects which degrade the quality of service for all or part of clients as quickly as possible

Q18.1 To what degree is it possible to guarantee service permanence and continuous service quality for telecommunications services provided to the public with no protection or non-interference guarantee?

Q18.2 How could users be informed of the characteristics of service quality of this type of network?

The development of services and uses by WLAN could quickly lead to bottlenecks for access to these bands, in certain areas and during certain time periods.

Q19. Do current and future standards offer the hope of channel access techniques that are efficient enough to limit or avoid congestion?

If WLAN technologies were to be used to offer mobile services to consumers, service quality would depend to a large extent on the possibility of switching a call on a 2G or 3G network to a WLAN network, with no break.

Q20. Would it be possible to switch a call on a GSM/GPRS/UMTS network to a WLAN network with no break? If yes, when could such a mechanism be operational?

3 If the use of WLAN technologies were to be extended to public networks operators...

Given the current use of frequency bands covered by this consultation and service quality requirements, certain limits might be necessary to provide telecommunications services to the public. Depending on the applications, the restrictive character of these limits might be minor or, on the other hand, crippling.

Q21 Is the quantity of spectrum available currently and in the future for WLAN technologies (cf. regulatory framework above and the decisions in the annex) sufficient to meet current use (private corporate and residential networks), and future needs for access to these frequency bands of public networks? If so, on what geographic zones might there be problems?

For systems using the frequency bands covered by this public consultation, it is not technically necessary to determine the number of operators since all available bands can be shared by all operators.

public authorities might consider limiting the number of players in order to maintain the quality of service offered, when operation is for providing telecommunications services to the public, in the framework of a L. 33-1 licence which imposes certain service quality obligations. However, this option is not automatic.

Q22.1 If WLAN technologies were to be used to provide telecommunications services to the public, to what degree would it be appropriate to restrict the number of companies having a public network licence on these frequency bands?

Q22.2 If numbers were to be limited, how many operators could reasonably be allowed on the same geographic area, while still providing:

- guaranteed minimum service quality and connection availability
- continued use of these bands without limit by private networks

Modified decree dated 3 February 1993 sets the fees applicable to the frequencies used by operators authorised under article L. 33-1 of the Post and Telecommunications Code, for the use, management and monitoring of these radio frequencies. On the other hand, to date, the frequency bands in France affected by WLAN technologies are not subject to any fees.

Q23.1 If WLAN technologies were to be used to provide telecommunications services to the public, with no guarantee of protection, and on the basis of non-interference, do you feel it would be necessary to charge a fee to any operator using these frequencies to provide telecommunications services on unassigned frequencies in the 2.4 and 5 GHz bands?

Q23.2 If so, what do you propose the fees be for these frequency bands?