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To the Body of European Regulators
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AIIP comments on "*Draft BEREC Guidelines on Common Approaches to the Identification of the Network Termination Point in different Network Topologies*"

Associazione Italiana Internet Provider ("**AIIP**") is the first association of Italian internet operators to be established in Italy (1995) and is an association representing *circa* fifty operators (competitors to the incumbent) providing electronic communication services and networks as well as access to Internet on the Italian territory.

Since 2017, AIIP has been engaged in the "modem libero" (free modem) campaign, to oppose the abusive practices put in place by many major operators to (i) prevent the end-users from freely choosing their terminal equipment, and (ii) to use the mandatory device (modem/router) as an anticompetitive form of lock-in.

AIIP welcomes the opportunity to provide its own comments on the above Draft Guidelines (BoR (19) 181 consultation).

1. INTRODUCTION AND GENERAL ASPECTS (DRAFT GUIDELINES, PAR. 1-2)

As to the definition of Network Termination Point ("NTP") and its location are open to a certain degree of discretion under the new European Electronic Communications Code ("EECC"), AIIP shares BEREC view on the need to provide harmonised criteria with Guidelines to be kept into the utmost consideration by NRAs.

As to the "**Characteristics of the NTP**" (Guidelines, par. 2.4), AIIP stresses the that the obligation to publish detailed information as to interface specifications of the NTP (§§ 9-12) should be adequately supported by NRA's power to enforce such obligations.

2. GENERAL REMARKS AS TO LOCATION OF THE FIXED NTP (DRAFT GUIDELINES, PAR. 3)

As to "***Location of the fixed NTP***", AIIP shares BEREC view statement that "*The NTP location has an impact on whether an equipment is part of the public network or part of the TTE*" (par. 2.3 of the Draft Guidelines, §§7-8 and 16-17), provided that some devices on the market are '*hybrid*' devices that may include functionalities typical of the public network and functionalities typical of the customer premises.

For the above reasons, AIIP points out that in defining NTP Location among the different options (A, B or C), BEREC -and, by consequence, NRAs- should always bear in mind the following aims:

(i) **to ensure full competition in the market for TE as provided by Dir.2008/63/EC**, which repealed and substituted Dir. 88/301/EEC (to pursue a different aim would result in blurring thirty years of TE liberalization);

(ii) **to ensure full competition among network operators and service providers and to prevent the use of TE for anti-competitive purposes** (e.g. by locking the clients, leveraging bundles of services offered through not interoperable equipment, etc).

An economic analysis of the features of the markets for electronic communications services shows that the risks of anti-competitive practices through TE is very high for operators with a large customer base. As a matter of fact:

- ***network infrastructures and services are featured by high fixed costs and increasing scale, scope and density economies*** (so that operators will face increasing marginal returns for each additional client added to their customer basis);

- ***electronic communications and information society services (e.g. DRM and payment systems) are featured by exponentially growing direct network effects***: since "*the utility that a user derives from consumption of a good increases with the number of other agents consuming the good*"[1], clients are attracted by the provider maximizing the services available on/through its network. In such case, absent interoperability between different communications networks and services, consumers would choose the largest network in terms of number of users (the lack of interoperability will have foreclosure effects on the market towards smaller operators) and

- ***digital contents are featured by indirect network effects*****:** Internet is a "two sided" market where contents and services suppliers on one side interact –through ISPs- with final customers on the other. Content and service providers are interested in offering contents to the largest customer basis and, if networks are not fully interoperable, through the services of the

1 M. L. KATZ - C. SHAPIRO, *Network Externalities, Competition and Compatibility*, 75 Am. Econ. Rev. 1985, 424; S. J. LIEBOWITZ – S. E. MARGOLIS, *Network Externalities (Effects)*, The New Palgrave's Dictionary of Economics and Law, MacMillan, 1998 http://www.pub.utdallas.edu/~liebowit/palgrave/network.html; R. MASON, *Network Externalities and the Coase conjecture*, in 44 Eur. Econ. Rev., 2000, 1981, http://www.soton.ac.uk/~ram2/papers.html

operator with the largest number of clients for access services. This, in turn, will attract the largest number of final customers on the network of such operator.

In such circumstances, in a concentrated market, the largest operators will have a strong incentive to exploit the network effects at their own advantage to the detriment of competitors also by leveraging it with specific policies regarding TE (e.g., by refusing interoperability or access). This incentive is strengthened by the increasing marginal returns that additional clients would grant to such operators. Therefore, in such conditions, excluding or anticompetitive conducts would be a rationale behaviour.

(iii) **to protect consumers and to cope with the interfering obligations set forth by Regulation 2015/2120/EU to ensure network neutrality** and, namely, by the provisions of art. 3.1 thereof.

3. GENERAL REMARKS AS TO LOCATION OF THE FIXED NTP (DRAFT GUIDELINES, PAR. 3.1)

For the above reasons, especially in the case of internet access service as well as in general of IP services, according to the general rules of law any definition of NTE that would shift the boundaries thereof downwards towards the client and that would therefore prevent the end-users right to use TTE of their choice, should be construed narrowly.

AIIP stresses the need that BEREC clearly states such a principle by integrating it into its own statement at §25, as follows (suggested integration is underlined):

> *"25. Therefore, in case of an internet access service as well as in general of IP services, NRAs should consider, upon a duly reasoned request of any interested operator, whether there is an objective and absolute technological necessity for equipment which the end-users are not able to replace with own equipment to be considered as an exception to be assessed on a case by case basis as part of the public network when defining the fixed NTP location (see section 3.2)".*

Please note that, as detailed in AIIP comments to § 3.3 Draft Guidelines, such an exception to the general rules under Article 3(1) of Regulation (EU) 2015/2120 should necessarily be provided by NRAs after a "case by case" analysis with the participation of all market players (as also implied by *BEREC Guidelines on net neutrality rules,* § 27[2]).

Therefore, the following AIIP comments on the different suggested locations for Fixed NTP (Draft Guidelines, §§ 3.21-3.2.3 will be based on the above.

4. SPECIFIC COMMENTS ON THE DIFFERENT OPTIONS AS TO LOCATION OF THE FIXED NTP (DRAFT GUIDELINES, PAR. 3.2.1-3.2.3)

2 *"NRAs should consider whether there is an objective technological necessity for the obligatory equipment to be considered as part of the ISP network. If there is not, and if the choice of terminal equipment is limited, the practice would be in conflict with the Regulation'.*

According to AIIP, as far as fixed wired line is concerned, Option A should be the rule.

Any exception, as per options B and C, should be assessed on a case-by-case basis by each NRAs by strongly keeping into account BEREC Guidelines. Such a specific procedure should be carried out with the participation of all interested parties.

As a matter of facts:

Fixed NTP is located at point A (§3.2.1)

Due to market economics, in order to prevent possible foreclosure behaviours by largest operators, as well as in order to comply with the EC legislation on TE as well as on network neutrality, it is of vital importance that CPE (modem, router, media box) is left to end-user choice.

According to AIIP, this might reveal a very fair balance between the need to ensure:

(i) fair interoperability between the different CPEs (which will have necessarily be granted by producers, by publishing all necessary interfaces information, in a form of "coo-petition");

(ii) free access to the Internet as well as to CPEs and network neutrality, as provided for by Reg. 2015/2120/EU;

(iii) full competition in the markets in TTE, which is the aim of Directive 2008/63/EC (which repealed Directive 88/301/EC which had same aim);

(iv) competition between service providers which will have a limited leverage to pot into effect exclusionary or lock-in practices.

In this respect, the outlined advantages would exceed by far the possible disadvantage BEREC has outlined at § *72 of the Draft Guidelines ("The use of a variety of different types of TTE not owned by the network operator could make network operations more complex compared to a case where only a few different types of own TTE are used").*

According to AIIP the regulator may not sacrifice competition and freedom of choice on the market by claiming risks to Interoperability.

Interoperability of communications services and of TTE is the key for maintaining a competitive environment in the future and shall be ensured in a promptly and effective manner by NRAs.

Of course, the worries as to simplicity of the operation of the public network (Draft Guidelines, § 3.3.2) are almost irrelevant if compared with the aim of such regulations, and may be rebutted as circumstances to be considered when assessing whether there is an objective technological necessity of equipment to be part of the public network.

As a matter of fact it is interest of all the supplied (both of TTE as well as of services) that their products and services ae easy to be managed and operated.

Therefore, according to AIIP, Option A should be the rule, as far as fixed wired line is concerned.

As a matter of fact, it appears that "*there is no objective technological necessity for any equipment at the customer premises to be part of the public network*", as per §54).

Of course, in this case, appropriate measures need to be in place which allow the network operators to adequately protect their networks in case CPEs are connected to the public network which do not comply with the NTP characteristics, and to resolve disputes between network operators and end-users (Draft Guidelines, §68.b).

Fixed NTP is located at point B (§3.2.2)

According to AIIP, Option B, which for the above reasons should only be considered in exceptional cases, an analysis should be performed to assess *pro* and *contra* in balance between the disadvantages as to interoperability between CPEs upstream and downstream the NTP and the advantages of having on the public network some of the CPEs.

The same reasoning is true as far as wireless fixed access is concerned (which are considered at § 3.3.6 of the Draft), as control over CPEs may be necessary in order to provide transmitting transparent capacity between, e.g., BTS and the antenna at the location of the final customer. The option B perfectly fits the case of Fixed Wireless Access as the NTP terminates the electromagnetic signals originating from the network, so it must be compatible to the rest of the network, following specific process to keep the network elements up to the same level of software features

3.2.3 Fixed NTP is located at point C (§3.2.3)

Under exceptional circumstances, which will be examined hereunder, NRAs may consider this option.

An analysis should be performed to assess *pro* and *contra* in a balance between the disadvantages as to interoperability between CPEs and the advantages of having on the public network some of the CPEs and Option C might reveal to be the worst case.

Under some circumstances there is the need to distinguish between residential and business users, as for business users some tailored services, in certain cases (eg. videoconferencing), might imply a larger recourse to control over CPEs by network operators.

Under such circumstances, it might be reasonable to foresee an exception as far as business clients are concerned and should be allowed more control over CPEs by network operators.

The same reasoning is true as far as wireless fixed access is concerned (which are considered at § 3.3.6 of the Draft), as control over CPEs may be necessary in order to provide transmitting transparent capacity between, e.g., BTS and the antenna at the location of the final customer in case of specialized device which include both radio wan functionalities and integrated customer services.

As far as the installer (either technician or end user) of NTP in a FWA network, must possess critical information, following a radio and capacity planning process and therefore, it cannot be deployed by anyone possessing basic electrician skills, the NTP should be located lower at the point C, when router and modem are integrated, and used, in the same equipment, and there could be critical issues related to the use of equipment chosen by the end user with reference to the proper functioning of the network and the services offered, even in relation to any performance limitations and risk on safety.

5. SPECIFIC COMMENTS ON NETWORK SECURITY ISSUE AND DATA PROTECTION (DRAFT GUIDELINES, PAR. 3.3 AND 3.4)

The NRA assessment of whether there is an objective technological necessity for equipment to be part of the public network shall include the criterion 'data protection'.

As far as the option where Fixed NTP is located at point A, AIIP shares the point raised by BEREC at §§ 91 and 92, that

> "S*ecurity incidents caused by modem, router, media box etc. might impact the end-user's private network. However, since they are part of the TTE, the end-user is responsible for the prevention and effects of such incidents*" and that
>
> "*Security incidents caused by abuse of modem, router, media box etc. could also harm the public network. Since these devices are part of the TTE, network operators are not able to ensure the deployment of countermeasures against discovered vulnerabilities in these devices*".

However, AIIP points out that as of nowadays both users and network operators have faced and are everyday (successfully) facing this problem, which has never brought any specific noteworthy and general disruption.

Therefore, according to the above network security may not be properly invoked to choose a model different from Option A.

The same is true as far as data protection in concerned.

6. LOCATION OF THE MOBILE NTP

As far as mobile networks are concerned, since the term 'NTP' is defined in the EECC (Art. 2(9)) as: "the physical point at which an end-user is provided with access to a public communications network", according to AIIP their NTP would have to be considered to be the SIM (Subscriber Identity Module) or its eSIM variant.

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Therefore AIIP provides the following Statement on the draft "BEREC Guidelines on Common Approaches to the Identification of the Network Termination Point in different Network Topologies"

BoR (19) 181

We expressly welcome the fact that BEREC is concerned with determining the network termination point (NTP), the physical point at which an end-user is provided with access to a public communications network. The location of the NTP is decisive when it comes to whether end-users have a free choice of their terminal device, as well as for the competition in the TTE market.

A clear definition of the NTP at point A ensures the end-users' free choice of terminal equipment by preventing the network operators from arbitrarily determining the location of the NTP and thus extending their market power into the area of telecommunications terminal equipment. It furthermore fosters innovation and competition among the TTE manufacturers with regard to all categories of devices – from a single modem to a highly integrated terminal device with a modem, router, WiFi, VoIP etc. (IAD[3])

With regard to the draft of the BEREC Guidelines on Common Approaches to the Identification of the Network Termination Point in different Network Topologies, we have the following comments and/or suggestions:

1) **BEREC should clearly state in the guidelines that it is in favour of point A as the NTP or make it even clearer that point A should be the rule when determining the NTP.**

Various statements in the draft Guidelines indicate that, from BEREC's point of view, the NTP should normally be at point A. In this respect, we are in favour of BEREC expressly stating once again in the draft guidelines that the NTP at point A is the rule. This would counteract a potentially

3 An Integrated Access Device (IAD) simultaneously supports multiple communications services such as telephony, Voice over IP (VoIP) and data services. For example, an IAD integrates a modem and a router; a modem, a router and VoIP; a modem, a router and WiFi; a modem and VoIP; a modem and an IOT gateway, and so on).

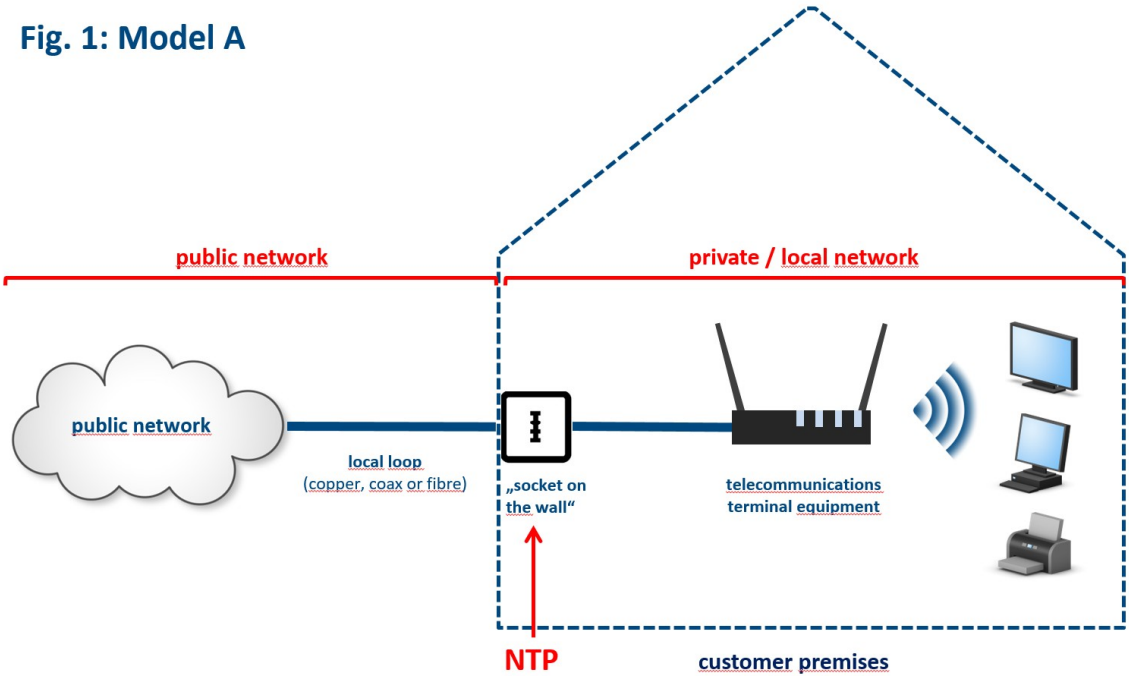
inconsistent interpretation of the guidelines and clearly contribute to their consistent application by the national regulatory authorities.

Any exceptions to the rule should be clearly defined as such. This could be the case, for instance, of fixed wireless access networks. In particular, in consideration of the existing technological and market conditions - and in conformity with Recital 5 of Regulation (EU) 2015/2120 - the NTP for fixed radio networks could be identified at point B (but not C). In these cases, the connectivity services should be provided through non-integrated devices. Thus, the terminal equipment compulsorily provided by the operator should be modem-only, converting the media types but non integrating any service.

So said, we would like to briefly outline the general advantages of a NTP at point A and the disadvantages of a NTP at point B or C.

An NTP located at point A would have the following advantages:

Fig. 1: Model A



- It gives the end-user complete freedom to choose and connect the terminal equipment in their home that best meets their needs and desires;
- It clearly separates the public telecommunications network from the end-user's private network;

- It allows the end-user to use an IAD as an all-in-one solution with low costs or separate terminal devices for separate services;
- It ensures the lowest possible power consumption for the end-user;
- It reduces the total cost of ownership as far as possible as there is no rent for an obligatory terminal device;
- End-users can keep their terminal devices even when they switch providers; this bypasses the potentially extensive setup effort for new devices (also in the local network);
- It creates a level playing field for European TTE vendors and promotes competition in the TTE market;
- Competition for the best terminal device encourages innovation at all technical levels. This in turn also has a positive impact on prices from which the end-user ultimately benefits;
- It makes possible the comprehensive participation of retailers in the value chain and adds value for system houses and consulting trade. This leads to more know how and support on all levels of the value-added chain;
- It allows unrestricted access to all services (e.g. VoIP) at the connection;
- Direct access to the physical layer is the only way to facilitate competition in wholesale scenarios;
- With a view to digital sovereignty, it safeguards the expertise and know-how of European terminal equipment manufacturers and vendors in Europe;
- It enhances global security, avoiding millions of identical hackable devices in case of security flaws.

2) **The draft Guidelines should clarify the impact of the definition of the NTP at point B (a.o. paragraph 3.3.1.2 and 3.3.2.2).**

From the draft BEREC guidelines there is no doubt that the modem must be a so-called **"standalone modem"**: Point 53. b. states that in model B, "[t]he NTP is the interface at the end-users' side of the modem". According to BEREC, the modem's properties represent the network termination, but it must **not have any other functionalities** such as switching, routing or WiFi. BEREC even gives examples of such a modem: a traditional DSL modem, fiber optic modem or cable modem. It follows from this that the modem in model B is necessarily a so-called "standalone modem" - i.e. explicitly **no integrated device with the component "modem"**.

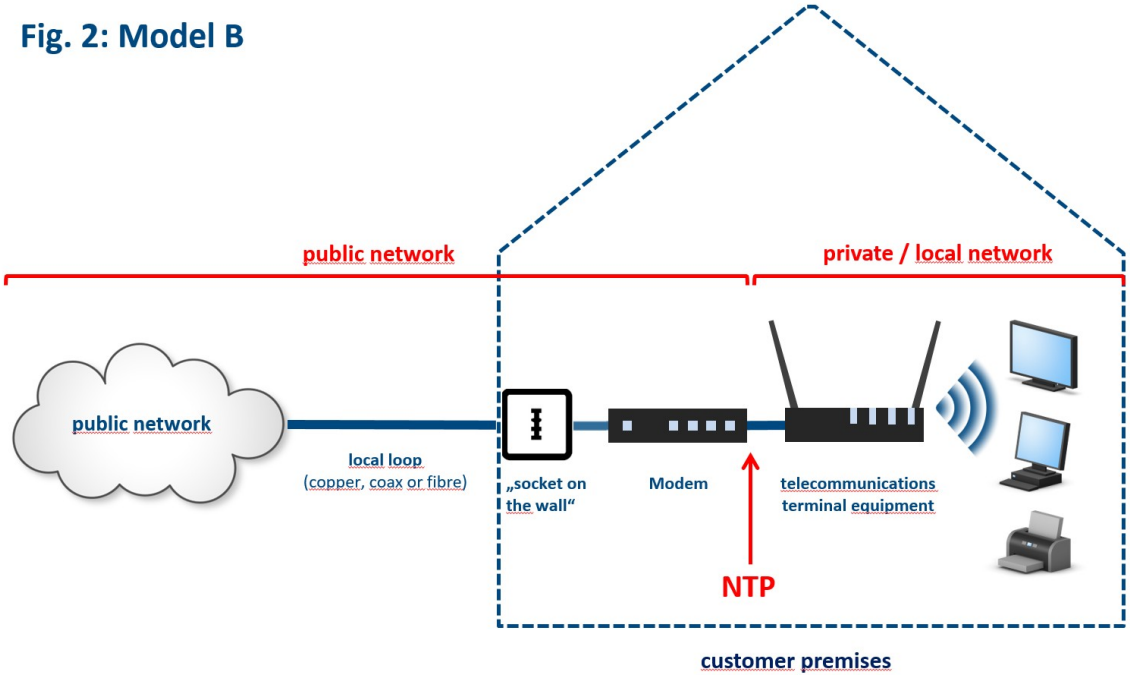
In the event that the NTP was defined at point B, this meant that the modem and router could not be integrated in one device (IAD). It is also not intended to "lead out" point B from an integrated device. This means that the "standalone modem" must NOT be replaced by an integrated device that is only switched to bridge mode.

This would then mean that in Model B the network operator would have to provide each of its customers with a "standalone modem" without further functionalities as the network termination, since the device would be part of its telecommunications network.

In our view, BEREC's comments so far do not make this sufficiently clear, especially as it would have devastating consequences for competition in the terminal equipment market; IADs could no longer be used and terminal equipment manufacturers would be deprived of their commercial basis.

An NTP located at point B provides some advantages to the ISP (among them, fault detection misfindings, technological independence) but it would also have the following disadvantages:

Fig. 2: Model B



- The end-user's free choice of terminal equipment is massively restricted;
- The public telecommunications network under the sovereignty of the provider no longer ends at the "socket on the wall", but expands into the premises of the end-user;
- An IAD can no longer be used. Instead, the end-user now has to use two separate devices – the standalone modem and another device for internet access, Firewall, WiFi, Smart Home or telephony; but:
    a. Two devices might be unsatisfactory for the end-user as there are numerous cables, two power supply units, a more complex installation process, the fault finding are considered unsatisfactory from the customer's point of view as there are too many

cables, two power supply units, a more complex installation, the fault finding is more complex etc.

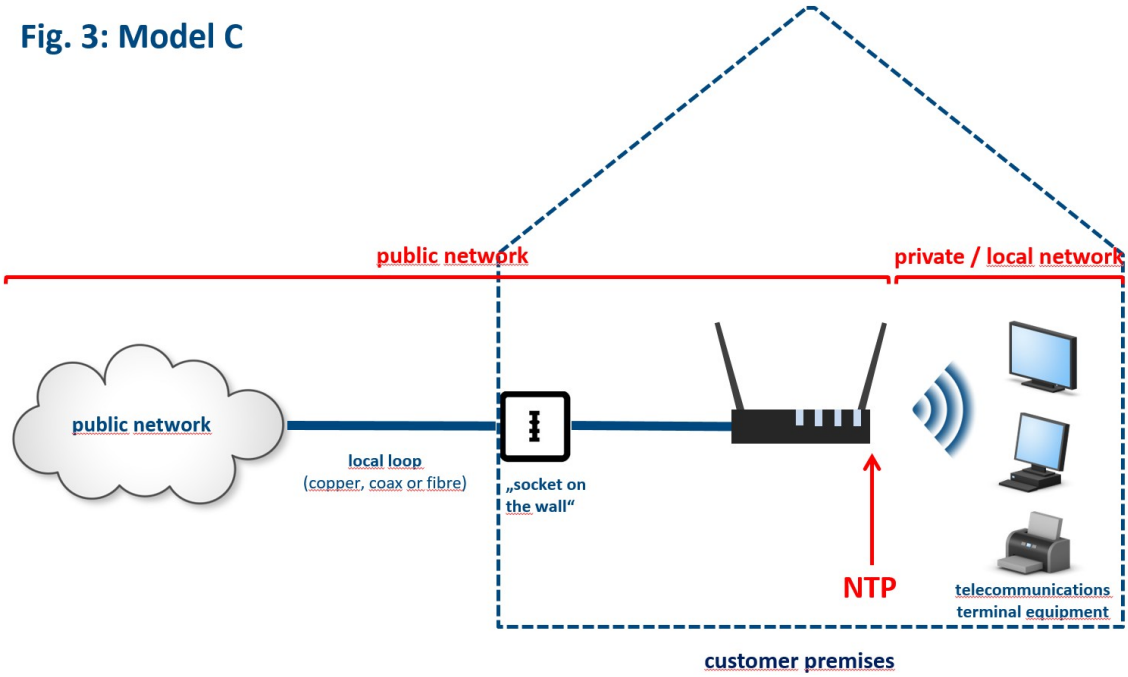
b. Two devices increase the risk of things going wrong.
c. And from the point of view of network management, two devices have to be supported, which leads to increased expenditure in the event of a fault, leading to greater customer dissatisfaction.

However, from a technical perspective, the standalone modem is in full retreat in practice. The chip maps of all leading semiconductor manufacturers show an integration of the modem function with the voice function, the router function, a powerful processor and partly WiFi, security and other functions for a gateway.

- Having to connect terminal device behind a standalone modem would result in an increase in power demand. The end-user would have to pay double for the electricity which in turn would also have an environmental impact. Moreover, problems can also arise from the fact that the end-user pays electricity for a device that is part of the public telecommunications network under the sovereignty of the provider and that they do not control;
- Terminal monocultures (here with regard to standalone modems) are attractive targets for hackers who want to exploit security gaps that may arise. In the event of a security incident, a large number of terminal devices are immediately affected;
- If the NTP is located at point B the market for TTE with an integrated modem (such as IADs) would de facto cease to exist because an integration of modem and other functionalities would be not allowed according to the draft BEREC Guidelines. The market for IAD is the most popular and most important part of the TTE market. Therefore for the terminal equipment market, this would mean a massive restriction of competition. IADs could neither be offered to end-users by the network operator nor by the manufacturers in the market. The clear trend towards integrated devices would be abruptly halted and innovation in this area brought to a standstill. This would also mean that the advantages of device integration ("everything in one device") - especially for the end-user - would be lost. In addition, the wholesale level, such as chip and component manufacturers as well as retailers and system houses would have significantly restricted markets;
- Increased investment costs for providers, as they would have to provide each of their customers with an obligatory modem and at the same time also offer a second, higher-quality integrated device (e.g. with firewall, WLAN or DECT) that meets customer needs.

Not only an NTP located at point B, but **also an NTP located at point C would have disadvantages for end-users, competition in the TTE market, security etc.:**

Fig. 3: Model C



- The end-user no longer has a choice about the terminal device on their connection;
- The terminal equipment in the end-user's premise is part of the public telecommunications network under the sovereignty of the provider;
- The end-user must supply the terminal equipment in their home with electricity even though they have no sovereignty over it and it is part of the public telecommunications network (and not their private network);
- In many cases, the end-user has to pay the purchase or rental costs for the compulsory terminal, but ultimately has no sovereignty over it as it is part of the provider's public network;
- Additional costs may also be incurred if the end-user has to pay an extra activation fee for WiFi or Smart Home functions; Switching from one provider to another is made significantly
- more difficult because it inevitably entails a change of the terminal equipment. As a result, both the new terminal device and all devices connected to it in the local network have to be reconfigured (e.g. WiFi, telephony, firewall settings, etc.);
- If the NTP is located at point C, the network operators unilaterally transfer the market power, volume and also revenue from the market for telecommunications terminal equipment to themselves, thus depriving the many terminal equipment manufacturers of their business basis;

- A very large number of merchants, system houses or electronics markets lose their market due to the terminal equipment forcibly marketed by the provider. The free terminal equipment market is thus ultimately wiped out, which has significant negative economic consequences. Providers would be able to control all functionalities of the device remotely. Business models in which individual functions would be offered for a monthly fee (e.g. WiFi on/off, WiFi at a low or higher speed, simple or high voice quality, limitation of the number of the connected devices etc.) could see a significant increase, since the only alternative for the end-user would be to switch provider, which is already considerably more difficult with an NTP at Point C anyway;
- If the subscriber-side interfaces (LAN interfaces) of the terminal device represented the NTPs, then private communication between two LAN interfaces would be routed over a public network. This raises considerable data protection issues. If the terminal device is under the network operator's control, the latter can theoretically access the end-user's private network (home network, company network). This means confidential information from the private network is no longer protected. Even if it can be assumed that network operators comply with all data protection regulations, there are still concerns, especially among end-users, against the background of past incidents (NSA, PRISM);
- The interfaces on the subscriber side of the terminal do not meet the regulatory requirements for the NTP (cf. EECC). For example, the LAN interface does not provide access to a telecommunications network, but to the private network of the end-user's own devices at home (LAN). There would also be hardly any device that could be connected with this LAN interface, because the network devices connected to the LAN, e.g. PC. printer or smart TV, are not telecommunications terminals;
- Internal house traffic may depend on a third party device (e.g. the connection between a personal computer and an ethernet printer is mediated by a telco operator IAD).

3) **BEREC should further highlight the consequences of the different locations of the NTP on the TTE market (a.o. paragraph 3.2, "Impact on the TTE Market")**

The market for TTE with an integrated modem (such as IADs) is the most popular and most important part of the TTE market in terms of customers, market volume and revenue and is therefore very important for many telecommunications terminal equipment manufacturers.

In the case of **model B**, the market for TTE with an integrated modem (such as IADs) could de facto cease to exist because the draft guidelines do not allow the integration of modems and other functionalities in this scenario.

For the terminal equipment market, this would mean a massive restriction of competition. TTE with an integrated modem (such as IADs) could neither be offered to end-users by the network operator nor by the manufacturers in the market. The clear trend towards integrated devices

would be abruptly halted and innovation brought to a standstill. This would also mean that the advantages of device integration ("everything in one device") - especially for the end-user - would be lost.

In addition, the upstream suppliers of telecommunications terminal equipment, such as chip and other component manufacturers as well as retailers and system houses, would have significantly more restricted markets.

For network operators, Model B would also entail a considerably higher economic cost: they would have to provide all their customers with a "standalone modem" as a network component and, in line with customer expectations, market a second, higher-quality integrated device (e.g. with WLAN or DECT) for connection to the forced modem.

If the NTP is set at point C, the public telecommunications network ends behind the router. This means that all devices connected to the router (such as printers, smart televisions or refrigerators, etc.) are terminal devices.

With regard to competition in the terminal equipment market, this would mean that only providers would be able to market integrated equipment to their customers. This would de facto put an end to competition in the terminal equipment market, with disastrous consequences for terminal equipment manufacturers.

Only in **model A** is a free, competitive market for IAD possible, in which the NTP is defined at point A, the public telecommunications network ends at the end of the "local loop", i.e. at the "socket on the wall". In this case, both routers and modems, which in the vast majority of cases are integrated into one device (IADs), are terminal devices. This should be the rule for any network, except radio networks, for which model B could be acceptable.

For the terminal equipment market this meant, as BEREC rightly points out, a high degree of competition. Both the terminal equipment manufacturers could market IADs in the retail market and the network operators could market IADs to the end-user. End-users would then ultimately be able to choose the product that best meets their needs and desires.

Point A also has the following advantages with regard to the economic advantages, also in terms of the free internal market of the European Union: These include the comprehensive participation of trade in the value chain, innovative competition for the best terminal equipment. For example, the lively competition created by liberalisation in the telecommunications terminal equipment market has led to a wide range of innovative and high-performance products for connection to telecommunications networks. Only with the clear demarcation of telecommunications networks and terminal equipment a point A lively competition could develop in the market for

telecommunications terminal equipment. This market is characterised by short innovation cycles, a pronounced product diversity and - based on this - unrestricted freedom of choice for users. Free and open competition for the best terminal device secures jobs, creates innovative strength and secures Europe as a tech location, especially in the medium-sized sector of terminal device manufacturers.

4) **In assessing the "network security" criterion, Berec and NRAs should consider the existing evidence about the risks of terminal equipments' monocultures (par. 3.3.3)**

In particular, we want to highlight to BEREC the case that happened in Italy during October 2017, which affected many end-users. From the 29th of september 2017, with the problem growing in the following days, many clients of a major Italian operator with fiber optic connections experienced serious malfunctioning, up to the total down of their internet connection. The failures quickly extended, involving practically all of the terminal equipments for fiber supplied by the operator in some geographical areas.

The source of the failures was probably a massive upgrade or a cyber attack, which clearly demonstrated that the claim of a greater security and resilience of the terminals supplied by an operator, rather than those freely purchasable on the market, is unfounded. It took weeks to restore the internet access of all the affected end-users and it became necessary for the operator to physically replace the modem-router at the user's premise. In the meantime, the end-users, being technically and contractually prevented from using an own terminal equipment, were effectively denied internet access and unable to engage a local technician

Had the users been allowed to use a different device, acquired on the retail market, they would have been able to access the internet without waiting a customer support which, in this case and as a consequence of the extreme extension of the failures, demonstrated its untimeliness and ineffectiveness.

We hereby provide some online sources about the case: (1), (2), (3), (4), (5), (6).

5) **BEREC should consider the models A, B and C not only with regard to "conformity of the definition of the fixed NTP location with the legal provisions" "impact on the TTE market" and "objective technological necessities" of the network operators, but should also consider the "necessities of the consumers" who are in the focus of the freedom of terminal equipment or whose main addressees are.**

In the present draft, BEREC refers mostly to "objective technological necessities", which refer to the "public network". Ultimately, only the technological necessities of the public network, i.e. the

network operators, are taken into account, the view or the necessities of the end-users are completely lacking.
We therefore argue that BEREC should also include " end-user necessities" as further evaluation criteria with regard to the models A, B and C.

In the objective technological necessities, BEREC fortunately already addresses end-user necessities such as security or data protection in individual areas.

However, we advocate that these existing criteria should be evaluated even more with regard to the end-user. In addition, we propose further evaluation criteria that are important for the end-user:

- **Digital sovereignty of the end-user (freedom of action and choice)**

The end-user's digital self-determination includes the possibility of action and choice. End-users throughout Europe already have the right to "use the devices of their choice".

In Model A, end-users have by far the greatest digital sovereignty. They can act independently and select and connect without restriction from a large number of innovative products on the market the terminal that best meets their wishes and needs, and can replace the device in case of emergency

The end-user has a clearly limited digital sovereignty with Model B. A modem is imposed on them over which they have no sovereignty. They only have the choice of a terminal connected to the modem, which, however, causes them additional electricity costs.

In model C, the digital sovereignty of the end-user is completely restricted. They cannot freely choose their terminal devices and no longer have sovereignty over them.

- **Change of network operator (switching)**

If the interfaces of a modem or router are the NTP(s) (model B or C), switching provider would force the end-user to also switch the obligatory modem or IAD, with greater difficulties in the "C" scenario

This turns out to be a significant barrier to switching providers as today's (WiFi) routers function as the central base station for home networks; they connect a range of WiFi devices (smartphones, computers, printers, speakers, TV sets, ...), telephones and a range of smart home devices.

The requirement to replace the router when switching provider forces the end-user to reconfigure not only the router but, more importantly, all devices in the home network connected to it. This can be extremely complex, even for technically experienced end-users. End-users with less

experience may be daunted by the technical effort and therefore avoid switching provider in the first place.

With model A, the end-user could continue to use his terminal device even if he changes providers.

- **Eco aspects / costs for the end-user**

connecting two devices in series (e.g. routers behind modems) would mean a significant increase in power requirements. With electricity prices also rising, this would have both environmental and economic disadvantages for the end-user due to the significantly higher costs involved.
With model A, using a highly efficient integrated device would be possible without any problems, considerably reducing power requirements. In addition, one of the selection criteria for the end-user could also be electricity consumption, which could also lead to more energy-efficient terminal equipment in the competition for the favor of the end-user.
For models B and C, the end-user has to pay the electricity cost of an additional device that they have not purchased.

In addition, the use of two terminals, especially at point B, results in an increased amount of electrical waste and electronic equipment. If the end-user switches network operator, one provider's fully functional mandatory terminal may have to be replaced with the new provider's mandatory terminal, which would ultimately be completely unnecessary and would have a significant impact on waste electric and electronic equipments (WEEE).

The amount of electrical waste could be significantly reduced by a more conscious use of electronic devices. The best solution in this respect would be to define the NTP at point A and thus the possibility of using a single, integrated terminal device.

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Should BEREC need any further clarification, please contact AIIP Chairman, Mr. Giuliano Claudio Peritore (presidenza@aiip.it - attn.: AIIP Chairman)

Rome, November 21st, 2019

Associazione italiana Internet Provider

The Chairman

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[*personal data removed*]