Bitstream Access

ERG Common Position – Adopted on 2nd April 2004

ERG Common positions shall not be binding on its members, but members shall take the utmost account of such positions or opinions. Where national circumstances prevent individual members from applying one of those positions or opinions, their reasoning for not following that position or opinion shall be published. Otherwise, parties to a collective position or opinion would be expected to take all appropriate steps to abide by that position or opinion, except in circumstances which could not be foreseen at the time when the position or opinion was agreed.

NOTE: This document was checked with the final version of the ERG Common Position on remedies in the regulatory framework as adopted by ERG on 1 April 2004. In case the Remedies Document will be changed following a review, the ERG Common Position on Bitstream Access will also be looked at again. For now, no changes on the substance were made except including a reference to the offer of VoIP services to end users (p. 3), the table containing the BSA regulations in place in Europe (see below p. 7-9) was updated.

This document focuses exclusively on bitstream access and the regulatory approach. The Bitstream access document published on 14 July 2003 for consultation has been revised in the light of the comments received in the consultation and the subsequent discussion in the IRG and ERG at the meeting on 20/21 November 2003. It does not cover other forms of wholesale broadband access such as unbundled and shared access. It outlines the regulators' understanding of bitstream access and the regulatory approach. NRAs should try to adhere to its conclusions as much as possible when taking decisions, but nonetheless the ultimate responsibility remains with the individual NRA. At the end of the document, some conclusions are drawn.

The document responds to the mandate given to the Fixed Network WG by ERG at its 3rd meeting on March 28th 2003 in Brussels. The Conclusions of the meeting state the following with regard to Bitstream Access "As bitstream access is important for the rollout of broadband services and applications, ERG agreed to investigate whether a harmonised approach is needed and possible. The issue will therefore be added to the ERG Work Programme 2003 and be discussed in the ERG September meeting (*25 September 2003*)"[1]. The paper is structured as follows:

I. Definition of bitstream access and delineation to resale
II. Regulatory issues
III. Conclusion

It is based on the first part of the IRG-document Plen(02)51rev2 (Local and broadband access, as updated on 22 March 2003 for the IRG High level Broadband Workshop) and incorporates the various documents, in which the Commission addresses the subject, namely:

[1] Cf. ERG(03)15 "Conclusions" (http://www.erg.eu.int/activities/meetings/index_en.htm).

- ONPCOM01-18 (June 22nd 2001; Rev1 on Sept. 26th 2001) High speed bitstream access;
- C(2003)497 Recommendation On Relevant Product and Service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC (Febr. 11th 2003);
- COCOM03-04 (Febr. 11th 2003; Rev1 on April 4th 2003; Rev2 on June 15th 2003) Bitstream access: current regulatory situation in Member States;
- ERG(03)12 (March 18th 2003) Bitstream access[2].

Since the 2nd half of 2002, the focus shifted away from unbundled and shared access as mandated by Regulation 2887/2000 to bitstream access. The reason behind this shift of focus to other types of wholesale products for competitors (operators and service providers) seems to be that the main objective of the Regulation – namely to foster competition in order to promote fast internet access offers to consumers – is being reached only in an unexpectedly slow way. As a result, there is concern that the incumbent is profiting from a first mover advantage possibly pre-empting the xDSL retail services market (e.g. ADSL, SDSL, VDSL services). In order to speed up the process of promoting a competitive broadband market under the new European regulatory framework for electronic communication networks and services, ERG is taking a closer view on how to enforce the provision of bitstream access, which in many instances may be seen as the more appropriate wholesale product to open the retail DSL services market for competitors.

The analysis focuses on the 3rd stage of applying proportionate and appropriate remedies to solve a competition problem identified, i.e. it assumes that the market review has been carried out, which means that the relevant market is defined (stage 1) and an SMP operator is determined (stage 2).

I. Definition of bitstream access and delineation to resale

In document ONPCOM01-18Rev1 high bitstream access is defined in the following way: “High speed bit stream access (provision of DSL services by the incumbent operator) refers to the situation where the incumbent installs a high speed access link to the customer premises (e.g. by installing its preferred ADSL equipment and configuration in its local access network) and then makes this access link available to third parties, to enable them to provide high speed services to customers. The incumbent may also provide transmission services to its competitors, to carry traffic to a ‘higher’ level in the network hierarchy where new entrants may already have a point of presence (e.g., transit switch location). The bit-stream service may be

[2] Besides the documents mentioned, the Commission collects data on the availability of bitstream access in the MS. Cf. the following documents:

- ONPCOM02-03 (Febr. 6th 2002) Local broadband access – developments regarding unbundling, bitstream access and leased lines;
- ONPCOM02-18 (March 26th 2002; Rev1 on June 5th 2002; Rev2 on July 10th 2002) Tables for collection of data on local broadband access;
- 8th Implementation Report (SEC(2002)1329, Dec. 3rd 2002)
- COCOM03-03 (Febr. 11th 2003; Rev1 on April 4th 2003; Rev2 on June 15th 2003) Tables for collection of data on local broadband access;
- COCOM03-40 + annex (Sept. 10th 2003) Broadband access in the EU;
- COCOM04-20 (March 3rd 2004) Broadband data.

The Fixed Network WG also collects data, which is not yet ready for publication.

defined as the provision of transmission capacity (upward/downward channels may be asymmetric) between an end-user connected to a telephone connection and the point of interconnection available to the new entrant."

COCOM03-04Rev1 adds the following: "Bitstream depends in part on the PSTN and may include other networks such as the ATM network, and bitstream access is a wholesale product that consists of the provision of transmission capacity in such a way as to allow new entrants to offer their own, value-added services to their clients. Resale offers are not a substitute for bitstream access because they do not allow new entrants to differentiate their services from those of the incumbent." In order to be able to differentiate their services (including such services as VoIP) from those of the incumbent, new entrants must have access at a point where they can control[3] certain technical characteristics[4] of the service to the end-user and/or make full use of their own network (or alternative network offerings[5]) thus being in a position of altering the quality (e.g. the data rate or other features) supplied to the customer.

The main elements defining bitstream access are the following:

- high speed access link to the customer premises (end user part) provided by the incumbent;
- transmission capacity for broadband data in both direction enabling new entrants to offer their own, value-added services to end users;
- new entrants have the possibility to differentiate their services by altering (directly or indirectly) technical characteristics and/or the use of their own network;
- bitstream access is a wholesale product consisting of the DSL part (access link) and "backhaul" services of the (data) backbone network (ATM, IP backbone).

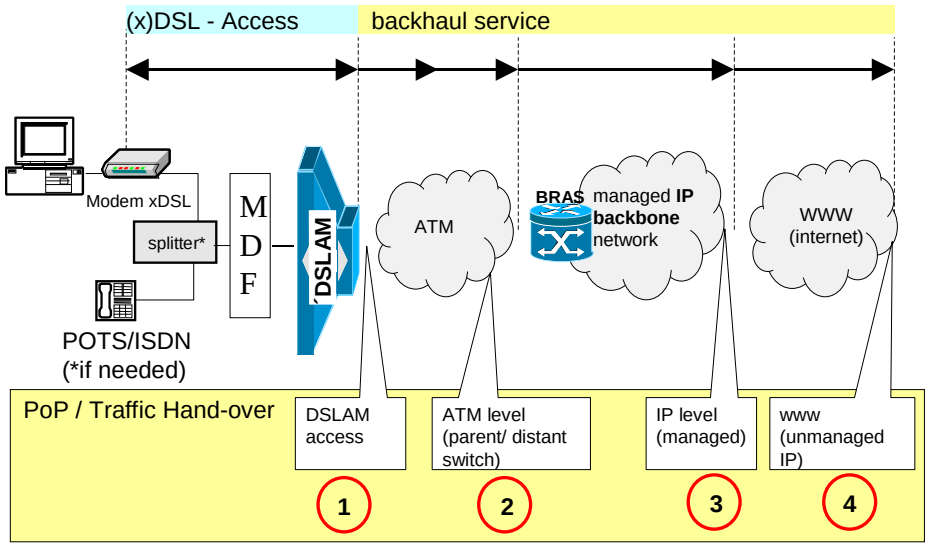
Bitstream access is thus defined as the corresponding wholesale product for DSL services (high speed services). However, this definition leaves open at which point the traffic is handed-over as there are various hand-over points for DSL traffic between the incumbent and the OLO/ISP (OLO = other licensed operator, ISP = internet service provider).

According to document ONPCOM02-03 high speed services offered to new entrants on the basis of unbundling, shared access and resale are explicitly mentioned as not being counted as bitstream access.

The point of access (point of handover of traffic) determines both the possibility to control the technical parameters with which the xDSL service[6] is provided to the end

[3] This includes indirect control, i.e. the incumbent alters the technical parameters as requested by the new entrant (see below for the details).
[4] See below for the details regarding technical parameters.
[5] the market for backbone facilities, where alternative operators offer backhaul services should not be left aside when considering bitstream access.
[6] to be exact it is not the xDSL access link as such that is altered, but the service offered to the end user (the high speed internet access product). The incumbent does not control the end user equipment (RTTE Directive).

user and the possibility to use the own network instead of the incumbent's. The following main options can be distinguished[7]:



The main difference between shared access[8] and bitstream access is the provisioning of the DSLAM. In the case of shared access the DSLAM is always operated by the new entrant (even in the case of virtual collocation the incumbent only maintains the DSLAM), whereas in the case of bitstream access, the DSLAM is operated by the incumbent. As the incumbent operates the DSLAM, there is no possibility for the new entrant to technically alter the xDSL access link (towards the customer) as such.

The possibility to differentiate the service offered to the end user (and thus the extent to which value can be added by the new entrant) declines from Option 1 to 4, in other words: the further to the right the access point is, the less possibilities the new entrant has to differentiate the service. It is important that the beneficiary's request defines the service.

Option 1: The incumbent provides the DSL access link and hands over the bitstream to the new entrant directly after the DSLAM.

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A DSLAM can handle only a limited number of profiles (e.g. 64/512, 512/256, 256/256) respectively it makes no sense to offer e.g. 10/600. The new entrant can only request the incumbent to get the product (the access part) technically altered so that he can use one or more of the implemented profiles or ask the incumbent to implement a further profile according to the beneficiary's choice if technically possible[9].

[7] The list is not exhaustive; also, the situation might change over time due to technological development.
[8] Or fully unbundled lines used to provide xDSL access.
[9] It makes no sense to draw the distinction between "Bitstream Access" and reselling according to whether the incumbent offers all or only a limited number of the available profiles at the DSLAM to its

But as with this option the new entrant is present physically at the DSLAM, he is supplying the backhaul product (ATM, IP backbone) himself and can make full use of his own network. This enables him to determine the Quality of Service through backbone networks (ATM and/or IP) and to offer a better quality of the **backhaul product** (lower overbooking factor) thus offering an end user DSL service with different technical characteristics.

This option requires a large upfront investment from the new entrant to be present at the **DSLAM level** (very cost intensive option).

Option 2: The incumbent provides the DSL access link plus a backhaul service and hands over the bitstream to the new entrant at an ATM-PoP or other technologies used[10] (at **ATM/corresponding technology level**). Different overbooking factors in the ATM backbone (reserved capacity for the PVC [tunnelling]) can be employed for different types of traffic (up-/downstream, ISP 1/ISP 2). The new entrant has the possibility to subdivide the virtual path further into virtual circuits[11]. The new entrant runs the BRAS (broadband remote access server) and has thus the possibility to alter parameters of the BRAS (depending on the BRAS type).

The new entrant is able to offer an end user product with different technical characteristics as he can alter the Quality of Service parameters (QoS) such as different overbooking factors provided by the incumbent.[12]

Option 3: The incumbent provides the DSL access link plus a backhaul service and hands over the bitstream to the new entrant at an IP-PoI (at **IP level**).

As the traffic is tunnelled in a managed IP network (it is a private IP network, not the public IP network of the www!), the quality of service can be guaranteed. A differentiation is possible to the degree that the new entrant can negotiate different overbooking factors with the incumbent (if offered) or the new entrant has other possibilities to influence the connection to the end user as he completes the downstream link[13]. In this option, the internet traffic of the new entrant goes over the incumbent's BRAS. As in this option the incumbent runs the BRAS, he has the possibility to monitor the end user and controls the virtual private channel (VPC).

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own end customers. The important point is that the product is defined by the beneficiary and the burden of proof that the requested profile is technically impossible to implement lies with the incumbent operator.

[10] Principle of technological neutrality.

[11] By actually subdividing the virtual path into virtual circuits the new entrant defines the minimum throughput in hours of high traffic demand.

[12] However, in order to be able to define such parameters per customer, i.e. to be able to define the QoS of the Virtual Circuits (VC) over the Virtual Path (VP), the incumbent has to configure this on the DSLAM as the VCs have to be defined at both the end of the new entrant and the end of the incumbent. The configuration is performed by the incumbent as requested by the new entrant.

[13] The level of control that the new entrant has over the entire access service (by having control of the tunnel) is limited in terms of QoS and lacks the flexibility to customize QoS parameters to the end user. It is less than in Option 2.

Option 4: The incumbent provides the DSL access link plus a backhaul service and also provides the **connectivity** to the public IP network of the World Wide Web.

At this level, the product the incumbent sells to the new entrant is technically the same, which the incumbent sells to his own customers. The new entrant does not need to run his own infastructure, the only thing he has to do is to market (brand), distribute and bill the product. As the new entrant cannot offer a differentiated product (end user product with different technical characteristics), this product is to be classified as "**Simple Resale**" (and not bitstream access). The new entrant provides in general the portal.

With Option 4, the delineation between bitstream access on the one and simple resale[14] on the other side and how to draw the borderline between the two is addressed. This is rather difficult as bitstream is a technical term whereas resale is an economic term, but the following distinction can be made.

With bitstream access the new entrant has the possibility to differentiate the xDSL product bought from the incumbent, which means he is legally allowed (by contract) or technically capable of changing the technical parameters (features/profile) in such a way as to create his own end user service which differs from the incumbent's xDSL retail product. This generally goes together with the use of his own network in order to complete the service, in other words the new entrant manages the access service. "In contrast to bitstream access, simple resale occurs where the new entrant receives and sells on to end users – with no possibility of value added features to the DSL part of the service – a product that is commercially similar to the DSL product provided by the incumbent to its own retail customers, irrespective of the ISP service that may be packaged with it"[15]. In this case the incumbent is in control of the technical parameters of the service thus defining the features/profile of the end user product. It was suggested to take as a criterion for a resale product the provision of the IP address by the incumbent, as this directs the routing via the incumbent's network with no possibility for the ISP to intervene at any point. The ISP buys the end-to-end link provided by the incumbent and markets the product to the end user without being able (neither contractually allowed nor technically capable) to change the product, whereas the access service is managed by the incumbent.

From the distinction made above it follows, that bitstream access points in the direction of infrastructure competition as the beneficiary controls the characteristics of the product and the use of the beneficiaries' own infrastructure is involved, whereas resale, which has none of these two aspects, is an indication for competition on the service level.

To sum up this part, it became clear that different points of access (points of handover of traffic) exist and that the different points of access entail different

[14] "… **Resale** is defined in such a manner, that a product is not acquired by a final user for the purpose of the use, but that it is acquired by another supplier for the purpose of sale to customers or final users. These suppliers are called retailers or service providers. The retailer therefore does not produce the product. Its achievement is *in nuce* a selling achievement. He sells a product in his own name and with his own billing, which he does not produce." (Neumann (2002), WIK Paper, Nr. 230, Economical Importance of Resale, p. 1) [own translation].

[15] cf. footnote 9 of doc. ONPCOM02-18rev2

degrees of differentiating the product offered to the end user for the new entrant and thus the degree of adding value to the final service (value chain concept). The following part deals with the regulatory implications of this finding.

II. Regulatory issues

In the ONP framework, within EU commitment for the promotion of broadband services deployment, bitstream access services have been already identified as a regulatory issue; it is worth to recall the Communication on unbundled access to the local loop, where the Commission formally considered bitstream access (together with full unbundling and shared access) as a complementary means of access to incumbent's local loop, since "…the availability of only some of these means of access is not enough…"[16].

From a legal point of view, the main difference between bitstream access and unbundled (both full and shared) access is that whereas full unbundled and shared access are both mandated by the Regulation, bitstream access has mostly been regulated using European legislation or the provisions of one/several directives. Under Community law, the legal basis for the provision of bitstream access is the principle of non-discrimination according to Art. 82 of the Treaty of Rome; as far as sector regulation is concerned, Art 16(7) of the Voice Telephony Directive (98/10/EC)[17], as well as Art.4 (2) of the Interconnection Directive (97/33 EC), following on general provisions of ONP-Directive (90/387/EEC), require that SMP operators must meet all reasonable requests for access to their network including access at points other than the usual network termination points.

This had two implications: a) in some cases it may have been very difficult to oblige (or to enforce an obligation based on the non-discrimination principle) the incumbent operator to make a bitstream access offer in the requested form and b) bitstream access has been classified across IRG/Europe in a great variety of ways and thus regulated as different types of services and under different regulatory regimes (in the RUO, in the RIO, as special network access, leased lines, in application of the non-discrimination principle, with various forms of price regulation). It is important to bear in mind these two critical factor, since they are going to be overcome by the new regulatory regime, which came into effect on 25 July 2003.

The following table reflecting the current regulatory status of bitstream access is taken from the new document of the Commission on bitstream access (COCOM03-04Rev2, June 2003) and updated by IRG/ERG member information:

Country	Regulation applied to bitstream access by law or through NRA intervention	Points of access / handover
AUSTRIA	Commercial negotiation	Regional PoPs, distant ATM switch (Broadband Remote Access

[16] Communication from the Commission 2000/C 272/10
[17] The latter being questioned by one NRA.

		Server = BRAS)
BELGIUM	Transparent fair and non-discriminatory conditions; in practice there is a mandatory reference offer, but limited NRA powers on retail tariffs resulting in allegations of price squeeze	DSLAM or parent/distant ATM switch, minimum one in each of the 8 access areas in Belgium
CZECH REPUBLIC	Not available	
CYPRUS		
DENMARK	Objective, transparent and non-discriminatory terms; cost-orientation	Parent ATM switch
ESTONIA	Bitstream access can be considered as Special access. Price should be calculated on the reasonable and non-discriminating basis	All access points after DSLAM
FINLAND	No price regulation, subject to competition law review	Distant ATM switch
FRANCE	"Special access"; NRA sets prices at level sustainable for efficient new entrants; non-discrimination in access conditions Price control	Parent and distant ATM switch National IP PoPs
GERMANY	Not available	
GREECE	Bitstream regarded as Special access. Price to be reasonable, non-discrimination, transparency.	IP handover to OLO, OLOs are directly connected to the BRAS
HUNGARY	Commercial negotiation	Distant ATM switch
IRELAND	Bitstream regarded as Special Network Access, hence subject to requirements of cost-orientation and retail pricing obligations	IP handover prod. Regional PoPs, distant ATM switch
ICELAND	Not available	
ITALY	Retail minus (50% margin); according to the non-discrimination principle	Parent ATM switch
LATVIA		
LIECHTENSTEIN		

LITHUANIA	Objective, transparent and non-discriminatory terms; cost-orientation, accounting separation	DSLAM-level
LUXEMBOURG	Not available	
MALTA		
NETHERLANDS	Non-discrimination; Defined as (wholesale) leased line. Reasonable pricing	14 (regional) ATM switches
NORWAY	Objective, transparent and non-discriminatory terms	DSLAM and ATM
POLAND		
PORTUGAL	In order to ensure non-discrimination, ANACOM has determined that: (i) discounts should be incorporated on the wholesale monthly fees, representing a reduction of 20%; (ii) for the 512kbps/128kbps offer, the wholesale monthly fee for the access line should not be higher than the retail monthly fee, applied by incumbent ISPs, deducted of 40%.	2 IP handover national PoI at BRAS level (a draft decision on ATM interconnection was published)
SLOVAKIA		
SLOVENIA	Defined as ATM leased lines for all ISP operators	28 (regional) ATM switches
SPAIN	Mandatory offer; Monthly charges per user connection: retail minus (40 – 42% margin), Other charges: cost-oriented.	109 Regional ATM PoPs
SWEDEN	**Proposal** (Feb 5 2004) to require SMP operators to offer bit stream under conditions of non-discrimination, cost orientation (LRIC), accounting separation and publication of reference offer.	DSLAM-level and handover at transmission network level
SWITZERLAND	Mandated by law since April 1st 2003. Commercial negotiation and then decision by ComCom (Federal Communications Commission) if no agreement is reached	Not determined yet (will be done in the contract or by ComCom)
UK	Non-discrimination; retail minus	Parent and distant ATM switch

Source: Annex of document COCOM03-04Rev2 / NRA information

Up to now in most countries only one access product – LLU or bitstream access – has been mainly used by OLOs/ISPs – generally the one made available first – suggesting the two forms of access being substitutes rather than complements. However, in the course of time they could more properly complement each other (e.g. bitstream access may be used to complete coverage), according to EC predictions. Already in the 2000 Communication on ULL (2000/C 272/10), the Commission concluded that "these three means of access to the local loop [that is: full unbundling, shared access and bitstream access] identified in point 2 **complement** each other". Also, Martin Cave[18] describes this feature with his picture of the ladder, the steps of which stand for the different forms of access. Thus new entrants can climb up the ladder by migrating from one form of access to the next higher step, continually adding more own value when going deeper into the value chain by investing more and more in own infrastructure. Thus bitstream access is as full and shared access to the unbundled local loop a means to promote infrastructure competition.

Therefore, it is important that legislation provides for the possibility to enforce both offers at the same time. Also NRAs must examine in detail the effect of the technical restrictions of incumbents' access offers on new entrants, particularly as regards the point of access. The assessment regarding the appropriate point of access should be made from the perspective of the beneficiaries, who should be able to define the product.

With the new developments, the economic differences between the two forms of access may turn out more clearly, i.e. they may fit different as input products for different business models or for different phases of market entry. Bitstream access may be called a "low-cost option" as less investment is required, but new entrants can nevertheless use their networks (without having to roll-out to the MDFs as is the case for unbundled access). With bitstream access, new entrants participate in the economies of scale (e.g. they use the DSLAM installed by the incumbent) thus levelling off the economies of scale of the incumbent. This has to be kept in mind as bitstream access might be the more appropriate access product in times of dry capital markets. The change of the financial market climate makes funding for new operators much more difficult.

In order for the "ladder model" to work, i.e. to allow the "climbing of the ladder of infrastructure competition" it is crucial that the prices of the different access products are consistently regulated (if price-control measures are in place), thus consistency of relative prices of access products must be ensured by the regulator if he imposes price controls. Of course all regulatory measures aim at promoting consumer benefits by making available a greater choice of services through competition. Therefore regulatory measures should ensure the right balance between infrastructure and service competition. Also, regulatory measures should not preclude competition on the backhaul market.

In different countries, the demand of new entrants for a particular bitstream access product (a specific handover point) may therefore vary according to the business model chosen as well as over time (depending on the market stage). Also, the offer

[18] Cave, M. "The Economics of Wholesale Broadband Access",
Proceedings of the RegTP Workshop on Bitstream Access – Bonn – 30 June 2003
publ. in MMR-Beilage 10/2003 (MultiMedia und Recht Vol. 6, 16 Oct. 2003), pp. 15

of different bitstream access products (points of access as well as number of points) depends on the network architecture, which may differ across countries. Therefore, national circumstances may lead to the need for different bitstream products. When intervening "NRAs must take account of these varying technical and operational conditions, resulting from differing network architectures, as well as the level of competition in the market"[19].

The new regulatory framework now in place, taking advantage from recent developments in the broadband access market and following on the complementary approach, explicitly favours a strong regulatory approach.

First of all, the Recommendation on Relevant Product and Service Markets (C(2003)497, published on Febr. 11th 2003) explicitly identifies bitstream access as part of the wholesale broadband access market (market no. 12) to be analysed for possible ex-ante regulation[20]. Further steps will be then national market analyses in order to designate eventual SMP operators and subsequently define an appropriate set of remedies (e.g. based on the nature of the problem, proportionate and justified in the light of NRAs basic objectives laid down in Art. 8 of Framework Directive[21]); nonetheless, the first assessment whether ex ante regulation would be justified in the light of recital 7-15 of the Recommendation has to be considered already dealt with by the Commission for all relevant market defined in the Recommendation. All of the 18 relevant markets already identified by the Commission cannot be considered as "new emerging markets", in the light of recital 15 of the Recommendation.

Document COCOM03-04Rev1 the Commission elaborated on how bitstream access is to be treated under the new framework. Bitstream access can be mandated under Art. 8 - 13 of the Access Directive (2002/19/EC) as "NRAs will be empowered to mandate access and impose obligations in accordance with Directive 2002/19/EC (the Access Directive), in cases where, as a result of market analysis, an operator is found to have significant market power on the market for wholesale broadband access"[22]. This also includes access to ancillary services such as collocation.

Such regulatory architecture overcomes the first crucial issue in the former ONP framework; the new framework foresees ex ante regulation, providing both clear procedures and specific remedies, which go well beyond the mere application of non discrimination principle. Thus bitstream access can be mandated according to national requirements according to Art. 12 AD and if considered necessary price controls can be imposed according to Art. 13 AD.

As far as the need for harmonization (which emerged as the other critical issue in the ONP framework), the application of such new framework itself, specifically tailored to promote a common approach to regulation, seems to guarantee a harmonized

[19] COCOM03-04rev1

[20] Cf. Explanatory Memorandum, p. 24. Furthermore (still on p. 24) according to the principle of technology neutrality, the Commission also considers possible alternative solutions for broadband access provision – cable, satellite, WLL, digital broadcast systems and powerline networks – concluding that, at the present situation, those access solutions are not yet sufficiently developed and/or reliable, thus emphasizing the crucial role of bitstream access services for the promotion of competition within market no.12.

[21] Cf. Explanatory Memorandum, par. 3.4., p. 13.

[22] COCOM03-04rev1, until the new framework is implemented, obligations regarding bitstream access imposed under the current framework must be maintained and enforced.

approach across Europe; it is just worth recalling, out of many other harmonization provisions, since it is specifically focused on remedies, Art.7 (2) of the Framework Directive, specifically asking NRAs to agree on the types of instruments and remedies best suited for particular types of situations in the market place.

Putting together the above statements and drawing the conclusion it follows that "there is a clear role for direct intervention by national authorities concerning bitstream access"[23], but NRAs have to take account of varying national circumstances resulting from different network architectures as well as the different market situations across Europe. As the provision of bitstream access is essential to the development of competition in the wholesale broadband access market as well as in the retail services market, NRAs should mandate a bitstream access product[24] according to national needs. As stated in the Explanatory Memorandum of the Recommendation "the point in the network at which the wholesale broadband access market will need to be supplied will depend on the market analysis and in particular on the network topology and the state of network competition"[25]. Given the differences in network architectures and market conditions requiring different bitstream access products, a "one-size-fits-all" regulatory approach would not be appropriate. In order to guarantee a coordinated approach as much as possible as NRAs should apply similar remedies in similar situations, an effort should be made to follow the same principles as regards e.g. SLAs or migration rules (e.g. effective migration schemes for beneficiaries from resale to bitstream products) and others (such as how to ensure the non-discriminatory use of the incumbent's economies of scale for new entrants). Regarding price regulation, it is important that the NRA ensures a consistent price structure of all regulated access products as competition along the entire value chain should be enhanced and the choice between the different forms of access might otherwise be distorted.

III. Conclusion

Where the provision of bitstream access is essential to the development of competition in the wholesale broadband access market, NRAs should mandate a bitstream access product according to national needs. The point in the network at which the wholesale broadband access will need to be supplied will depend on the market analysis and in particular on the network topology and the state of broadband competition. When defining the appropriate point of access, NRAs should take the perspective of market parties.

[23] COCOM03-04rev1
[24] preferably as a generic obligation on the basis of a reasonable request.
[25] Explanatory Memorandum, p. 25