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**Public Consultation on the Common Characteristics of Layer 2 Wholesale Access Products in the EU**

Dear Sir or Madam,

1&1 Telecom GmbH ("1&1") thanks you for the possibility to present the firm's position with regard to the form of a substitute for the Unbundled Local Loop (ULL), particularly the aspect concerning self-determination of product design, for Germany.

**I. Introduction**

Telekom Deutschland GmbH ("Telekom") has presented a standard offer for Layer 2 Bitstream Access (L2-BSA). From the point of view of the Telekom, the L2-BSA product at issue is suitable as a substitute for the access to the physically unbundled Local Loop (LL) for very high bit rate connections (VDSL2/Vectoring connections) that are being dropped in association with the Vectoring expansion (both at the remote Service Area Interface (SAI) and the SAI in the local Main Distribution Frame (MDF) area).

1&1 finds here that the L2-BSA product is not suitable for satisfying the demand of the competitors (on the German market). Because what the competitors likewise require as a substitute for the physically unbundled LL is **local access** and not, as envisaged, only a **regional handover** to 899 Points of Interconnection (POI) of so-called BNG points. Furthermore, the L2-BSA product at issue lacks a number of fundamental characteristics with regard to self-determination of product design which are essentially necessary for a substitute for the physically unbundled LL.

1&1 considers it to be compellingly necessary that, in addition to the L2-BSA product at the regional level, the Telekom additionally provides a VULA product at the local level. Such a local wholesale product is indispensable for the complex competition in Germany because a VULA product comes closest to the physically unbundled LL with regard to self-determination of product design. The VULA product and L2-BSA are not a substitute; instead they are two complementary products that will equally be of crucial significance for the competition in Germany. While L2-BSA (899 regional Poles) is used for **Germany-wide development**, a VULA wholesale product (around 100k local Poles from around 320k Poles) is, due to the high number of possible Poles, used for the local development of individual regions. The high number of Poles possible with VULA is expected to lead to a locally limited demand, or consequently only there where parallel SAI development is economically workable.



However this side-by-side existence of the two wholesale products is not permitted to lead to the regulation of L2-BSA being changed from ex-ante regulation to ex-post control. Instead this complementarity necessitates an L2-BSA that is oriented on a VULA product with regard to the service and product quality. Consequently, with the presented L2-BSA product there is still a considerable need for improvement by Telekom, particularly for several central technical and commercial aspects regarding self-determination of product design. An L2-BSA product adapted with respect to self-determination of product design must be provided promptly, because on the one hand, L2-BSA will apply as a compulsory substitute for the LL as of the record date 01.01.2016, and on the other hand, due to the problems with regard to subsidy laws in the funding of Vectoring expansion projects, the competitors will demand a bitstream product at Layer 2 that is suitable for the market.

In light of the Vectoring 1 decision and the Telekom application to have the exclusive right to expand Vectoring in the local MDF area, the acceptance of a local wholesale bitstream product is to be equated with an SAI expansion. Commercially, the prices for an L2-BSA must be oriented on the MDF LL and hence for a VULA product on the SAI LL.

## **II. Parameters for self-determination of product design**

From the 1&1 point of view, the following parameters in particular determine self-determination of product design and are consequently indispensable with regard to the form of an adequate substitute for the unbundled access to the local loop.

### **Technology and availability**

Where possible, a local substitution product should be available at the same point as the access to the MDF or SAI LL, with the option of routing to a higher level location. This means that where necessary and as is also the case in other European countries, in addition to the local access product the provision of a regional access product, for example, to the (already mentioned above) 899 BNG of the Telekom.

On the one hand, the product must be available for all NGA architectures (FTTC, FTTB, FTTH) and on the other it must also be suitable both for private customer connections and business customer connections.

Technically, the handover for the local access must be handled at the MSAN because the MSAN represents the universal connection of the subscriber lines (no matter what the technology) and converts to packet technology. At this point, 1&1 would like to express its doubt that the Telekom network concept is technically suitable for "producing" an appropriate local LL substitute.

The handover takes place at Layer 2 (e.g., 1 GE or 10 GE) in accordance with international standards.

### **Bandwidth limitation and overbooking**

The bandwidth that can be achieved on a physical loop is limited by the loss and the technology that is used. A substitute should therefore deliver the maximum possible bandwidth in order to allow the same product design freedom as with the unbundled LL. This means that it must be ensured that a consumer has maximum flexibility (design freedom) with regard to the usable bandwidth profiles (Mbit/s downstream, Mbit/s upstream) for designing its own end customer products. Here a too narrow limitation is fundamentally not permitted with regard to all NGA architectures (FTTC, FTTB, FTTH).

Furthermore, the availability of symmetric bandwidth profiles must be ensured. The competitors must be able to freely structure and define the bandwidth profiles for end customers. This means that at the wholesale level, the competitors must be able to design the bandwidth corridors freely, and the Telekom is not permitted to stipulate these corridors. All xDSL versions and successor technologies must be included. In this way, new end customer profiles can also be developed with their own bandwidth patterns.

A physical loop does not recognize any overbooking. Therefore non-overbooked access is also fundamentally necessary for an LL substitute.



## QoS/Traffic classes/Traffic prioritization

A physical loop does not contain any active elements. Traffic classes and traffic prioritization are therefore not necessary. Ideally, a substitute should transparently transfer all data and the traffic should consequently not be prioritized before reaching the consumer or competitor. If the handover takes place not at the DSLAM/MSAN level but instead at a higher network level (for example, at the BNG), prioritization as a part of the wholesale product can be useful. Here the costs that arise must also be considered. Implementation of the traffic prioritization as a part of the wholesale product should only be done if this is more economical than implementation at the service provider.

If the abovementioned approach cannot be implemented, the determination of QoS traffic classes that may then be necessary must be oriented on the requirements of the NGA Forum of the Bundesnetzagentur (The Federal Network Agency for Electricity, Gas, Telecommunications, Post and Railway), because an extensive discussion was already held in this regard in 2011 and the recommendations have already been formulated. These are as follows:

*"In order to be able to cover all essential services of the service provider, four downstream quality classes and two upstream quality classes are specified in the private customer area. In the area of category 1 and 2 business customer products, four or ideally six downstream quality classes and the same number of upstream quality classes are specified. The specified quality parameters for the defined traffic classes are to be met."*

Service class		QoS parameters depending on access network technology used (typ. ranges)		
		Latency	Jitter	Packet loss
1	Real-time (interactive)	<10 ms ... < 30 ms	< 2 ms ... < 10 ms	< 0.1 %
2	Streaming (multimedia)	< 10 ms ... < 100 ms	< 5 ms ... < 20 ms	< 0.0001% ... < 0.1%
3	Critical applications (low loss)	<15 ms ... < 100 ms	< 10 ms...<20 ms	<0.01%...<0.05%
4	Best effort	<100 ms	Best Effort	Best Effort

The quality parameters for the individual traffic classes should be defined and bindingly specified. For Frame Delay (one way VDSL handover connections) these are <40 ms for best effort, <10 ms for conversational and <20 ms for critical applications. For the parameter Frame Delay Variation (jitter) the values should be <20 ms for best effort, <3 ms for conversational and <10 ms for critical application. With respect to Frame Loss, the values should be <0.5% for best effort, <0.1% for conversational and <0.05% for critical applications. The traffic classes are only permitted to be limited at the respective network input. For critical applications 40% should be specified for this; if this figure is exceeded the traffic is not permitted to be discarded and must be continued in a best effort. For conversational, 20% should be specified and the traffic should be discarded if this level is exceeded. This ensures that the competitors are not impaired by the bandwidth limitations in the respective QoS classes on the individual lines and at the same time that they can design competitive end customer products.

## VLAN issues

A VLAN is a logical sub-network; it allows separate management of different data streams and services. A number of services can be transferred on the physical LL. In order to replicate this with a corresponding substitute on a bitstream basis, it must be possible to distinguish between the data streams in Layer 2.



VLAN in accordance with IEEE 802.1q is used for this. The number of virtual connections per customer (Customer VLAN) must correspond to the different services that are possible.

Here it must be the case that each dial-up access does not necessitate reallocating the VLANs. Instead, it must be made possible for the consumers to make all settings in the end customer profiles one time during the setup. Otherwise, each dial-up access would necessitate again identifying the end customer and the corresponding settings. However this can be accomplished only by means of a corresponding additional protocol that is added as a header before the data packets. However this also means that the useful packet size is reduced. In addition, such protocols are not compatible with Ethernet and would additionally restrict self-determination of product design. This would mean that it would no longer be a bitstream access product on Layer 2, and it would instead be one on Layer 3.

#### **CPE and modem configuration**

The alternative network carrier can use a modem/CPE of its choice on the unbundled LL. A substitute should accordingly only be provided with a passive connection point ("wires-only").

A further requirement is that network carriers who use a substitute can carry out a remote configuration of the modem/CPE. The substitute must therefore allow the transfer of the TR-069 protocol (dominant international standard).

#### **Technologies in MSAN/DSLAM management**

In order to allow product design possibilities similar to those with ULL, the consumer should be able to have direct access to the DSLAM/MSAN. This access is used both for configuration and for data retrieval during fault localization.

#### **Multicast replication**

Multicast replication is not required if ULL is used because the LL has a dedicated allocation to a user. If the consumer of the substitute accesses MSAN/DSLAM directly, multicast replication is likewise not necessary.

When accessing the BNG, the expenditure to implement multicast replication as a part of the wholesale product must be weighed against the savings in the bandwidth.

#### **Security measures**

An LL is physically isolated. In the case of a substitute, it must be ensured that no unauthorized data access is possible. Therefore all equipment that transports the data of various providers must be correspondingly protected.

#### **Commercial framework**

In terms of prices, the "local" substitute for the physically unbundled LL must be oriented on the SAI LL and is not permitted to be more expensive than the SAI LL. In light of the Vectoring 1 decision and the Telekom application to have the exclusive right to expand Vectoring in the local MDF area, the acceptance of a local wholesale bitstream product is to be equated with SAI expansion. Seen commercially, the price for such a product must consequently be oriented on the SAI LL.

At the same time, the "regional" substitute necessary for the competition must be oriented on the MDF LL and it is not permitted to be more expensive than the MDF LL.

### **III. Summary**

In conclusion, it needs to be noted that the Telekom, in the framework of its present network migration to an NGN (IP network), is not offering an adequate wholesale bitstream product that can function as a substitute for the ULL. The offer of Layer 2-Bitstream Access (L2-BSA), which is currently the object of a regulatory process before the Bundesnetzagentur consequently does not constitute a remedy because it does not provide for sufficient self-determination of product design for alternative telecommunication companies.





1&1 therefore joins BEREC, which in the draft of its document BoR (15) 64 determined that a wholesale bitstream product must as much as possible provide competitors (or alternative telecommunication companies) with the flexibility of a physically unbundled loop so that these parties can provide different products and innovations on this basis.

Please feel free to contact us if you have any questions for us.

Yours faithfully

A handwritten signature in blue ink, appearing to read "Marko Iaconisi".

Marko Iaconisi  
Expert Telecom Account

A handwritten signature in blue ink, appearing to read "M. Ulmen".

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