



Verizon Response to BEREC's Public Consultation on Common Characteristics of Layer 2 Wholesale Access Products (BoR (15) 64)

I. General comments

We welcome BEREC's effort to identify the common characteristics of layer 2 wholesale access products in the EU and the consultation on this subject. As different technical solutions are being adopted in the Member States, harmonization is essential to ensure a Single Digital EU market and further economic growth.

Layer 2 wholesale access products are relevant for the provision of services to business users. They are relevant not only for Markets 3a and 3b, but also for Market 4 of the revised Commission Recommendation on Relevant markets. Business users are increasingly demanding services based on this kind of products, particularly to serve secondary locations. As a consequence, operators focused on the provision of services to business users are increasingly making use of layer 2 wholesale access products.

As a matter of fact, harmonization of layer 2 wholesale access products is particularly necessary for the provision of services to business users. Business users often contract single solutions across borders. Operators providing services to business users acquire wholesale access products at a national level, integrate them, and then provide their retail cross-border services. Traditionally, access was provided through leased lines, which were standardized products as opposed to layer 2 wholesale access products that are not standardized. As the report demonstrates, different technical solutions are emerging in the different Member States. It is increasingly difficult for business operators to integrate national access into a seamless cross border retail solution for their end-users. As a consequence, harmonization of layer 2 access products is particularly relevant for the business market.

The European Commission acknowledged this fact and included a business grade access product among the compulsory harmonized access products in the Draft Connected Continents Regulation laying down measures concerning the European single market for electronic communications.

As a minimum the following elements should be harmonization:

- (i) Technical conditions: jitter, delay, MTU, etc.;
- (ii) Service Level Agreements: particular in relation with repair terms, as to ensure similar availability rates;



- (iii) Access points: Business operators require access points adapted to their specific characteristics. Regional and even national access points are necessary. It is not enough to regulate access at a local level in order to provide an alternative for the traditional local loop unbundling; and
- (iv) Underlying technologies: Layer 2 wholesale access products for business operators have to be available for all access technologies, not only FFTH/FTTC, but also traditional copper loops. This is already the case in some national regulated offers. It seems necessary to ensure this in the case in all the Member States.

We strongly recommend that BEREC continues its work in this area. The publication of a BEREC common position on best practices for Layer 2 Wholesale Access Products in the EU would be a welcome next step.

II. Specific comments on technical characteristics

As regards the specific technical conditions in Chapter 4 of BEREC's draft Report on Common Characteristics of Layer 2 wholesale access Products in the European Union, we have the following comments.

Introductory information

- Uncontended bandwidth and QoS: the link between the DSLAM and the aggregation node can be dimensioned in order to support a mix of contended and uncontended services. This is normal BAU capacity planning.
- VLAN concept should be harmonized. A good model has been developed in Belgium, Germany and Italy, whereby the alternative network operator (ANO) can choose between a dedicated or a shared VLAN scenario.

Technology

- We have no comments.

Availability

- Obviously a broader availability will lead to a more attractive business cases for ANO's. At a minimum, L2WAP needs to be available in areas where physical unbundling is no longer technical possible.

CPE/Modem

- Standardization/harmonization throughout Europe is required.



- In order to create a future proof solution it should be clear that the handover interface at the ANO end user should be plain Ethernet delivered over a modem or "wire only". Under no circumstance the CPE should be a router. In case of "wire only" ANO should be allowed to use its own modem without having to go through an expensive certification process. As an example the vendor restriction imposed in Spain does sound unjustified.
- However, it is acknowledged that the NGN operator should be able to disconnect such modem in case it poses as risk to the integrity of the NGN. Clear rules around this are required.

Bandwidth

- Standardization/harmonization throughout Europe is required.
- Both asymmetric and symmetric bandwidth profiles need to be available.
- As with most current bitstream offers, a mix of pre-defined bandwidths and ANO own defined bandwidths need to be available.
- The type and number of bandwidth profiles need to reflect the incumbent retail offering as a minimum.

QoS and traffic prioritization

- Standardization/harmonization throughout Europe is a must. In the current offerings some use DSCP for QoS whilst others utilize L2 mechanisms. The most flexible solution is where L2 P-bits are used so QoS can be applied to both L3 and L2 layers.
- Both contended and uncontended access options need to be offered.

Number of VLANs per subscriber access line

- Standardization/harmonization throughout Europe is required.
- Several VLANs per end user is a requirement: 4 as a minimum.

Multicast

- Standardization/harmonization throughout Europe is required.



- Multicast replication functionality is not applicable if a dedicated 1:1 VLAN concept is used. In such a case, there should be no restrictions on the transmission of multicast traffic. Therefore offloading the multicast traffic to a separate IPTV platform should not be done by the incumbent if 1:1 VLAN concepts are used.
- In case of shared VLAN a guaranteed level of multicast should be offered though it is acknowledged that this level does not need to be equal to the full bandwidth.

Customer identification

- Standardization/harmonization throughout Europe is a must.
- The best solution is to provide plain active Ethernet with no requirement of PPPoE or IPoE.
- If customers are identified by the s-vlan at the PoH, the ANO should be free to use whatever c-vlan he requires, without having to agree on the c-vlan tags with the NGN operator. Using a c-vlan should not even be mandatory in this case.
- In a dedicated (1:1) VLAN concept, the customer is identified by the s-Vlan, so there is no requirement to use additional authentication methods, like DHCP Option 82 or PPPoE credentials.
- If the NGN operator uses a dynamic (session based) design, the end customer should be identified by the port he is connected to, and Ethernet session setup (i.e. establishing the path between the port and the s-vlan) should be transparent.
- To support services in sparsely populated regions, regional or national PoH should be supported. An ANO will otherwise have no means to provide commercially attractive services in those regions.
- The aggregation needed for regional and national PoH should be transparent to the ANO, meaning that neither the VLAN concept should change, nor any additional capacity specification (i.e. inter-regional bandwidth) should be necessary.

Security

- Direct communication between the VLANs needs to be dropped.
- Mechanisms against flooding or DoS should be implemented (MAC anti-spoofing, rate limit L2 broadcast.).
- Duplicated MACs should be detected.



- ARP inspection and DHCP snooping should be supported if the service is IPoE based.

Fault Management and Configuration of the DSLAM

- This section should also be seen in relation to future developments. With SDN developments in mind, ANO's should be able to configure their own modems and DSLAM parameters, both for provisioning and fault management.

Future Technological Developments

- It is critical that the L2WAP offering follows the latest technological developments. Especially if those are also being offered by in the incumbent retail offers. SDN and NFV developments have to be considered today in defining a future proof offering.

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