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Ericsson's Response to ANACOM Public Consultation on the Regulatory Approach to Next Generation Access Networks (NGA)

01 August 2008

- all responses to be treated as confidential -

Ericsson welcomes the opportunity to respond to this consultation and focuses more on its technical aspects and less on regulatory matters.

***Question 1**: What do you anticipate to be the potential needs of greater bandwidth on the part of final consumers, especially in terms of (new) services offered and downstream and upstream speeds?*

A1: It is Ericsson's belief that a continued demand, from both consumers and enterprises, of very high bandwidths for all types of data communication. Although some of the demand can be correlated to specific services, e.g. video on demand, the general trend is that all applications benefit from higher capacity in terms of lower latency, better quality and in general shorter response times. Hence, we have seen developments in advanced markets such as Japan and South Korea where very high access speeds (1 Gbit/s full duplex) originally adopted by a limited number of "power users" gradually are spreading to a much wider user community applying the high capacity access speed to ordinary Internet activities, such as web (video) browsing, e-mailing, chatting and gaming.

Also it's foreseen that demand for "better quality" in already existing Internet based services (including broadband TV, file sharing and communication) rather than any particular service will drive the demand for bandwidth in the access network. Thus, the competitive situation between operators and technologies in a country, rather than any specific service, typically determines the capacities deployed in the access networks. This implies that in some regions where competition is low, access speed will remain in the xDSL range (2 – 50 Mbit/s, asymmetrical) for a long time, while in other regions speeds of 100 Mbit/s – 1 Gbit/s full duplex will be widespread.

On our opinion a clear trend is for a general shift to symmetrical, full duplex, access technologies over the next decade, due to the increased consumer interest in media sharing and from the needs of enterprise business data exchange.

***Question 2**: To what degree might the expected development in the data compression algorithms offset the need to increase bandwidth without compromising the necessary increase in data transmission capacity?*

A2: There will undoubtedly be more advanced compression algorithms available over time. However developments of data source volumes (HDTV, high definition digital SLR cameras, audio files with 5.1 channels etc.) have so far outpaced the development of compression techniques. Hence, we do not think that data compression will reduce the bandwidth demand to any major extent.

***Question 3**: Do you see, at the level of the NGA, any aspects related to security and emergency issues which merit particular attention?*

A3: Fixed NGA networks will increasingly be dependent on active equipment at the end user location. The notebook computer used may be battery powered, but the CPE (modem, optical-electrical converter, etc.) is typically still mains powered. Hence, a shift to NGA fixed networks requires that attention is taken to powering of end user equipment and fall back procedures for emergency situations.

***Question 4**: How do you see, in general terms, the competitive situation in terms of the access network in Portugal?*

A4: As indicated on the data provided by ANACOM in the consultancy report on the broadband offering in Portugal, Ericsson also understands that all major technologies for access networks are implemented and available in the Portuguese market.

***Question 5**: How do you see the evolution of other access networks, including the coaxial cable network? Do you foresee this network (also) evolving to NGA, supported in fibre optic?*

A5: It can be assumed that all broadband access networks will evolve to significantly higher data rates and thereby be classified as “NGA” networks:

- Mobile broadband will evolve to data rates in the range of 50 – 100 Mbit/s with HSPA and later LTE over the air interface, being served by fibre optical or high speed microwave backhaul links.
- CATV networks will evolve to 100 – 400 Mbit/s data rates with DOCSIS 3 and include fibre optical backhaul
- Copper networks will be augmented with new modulation schemes and fibre backhaul to reach speeds of 100 Mbit/s or more.
- Fibre networks (GPON and Point to point) will evolve towards Gbit Ethernet speeds.

Essentially all NGA evolution is dependant on deeper fibre. Presently we see fibre to the mobile radio site / fibre to the cabinet (VDSL2 / DOCSIS3) being the next step deploying fibre to home.

***Question 6**: Do you consider the current degree of coverage to be sufficient, in geographical terms, as well as in terms of diversity of OLL supported retail offers? Do you see any constraints on their increase?*

A6: No comments from Ericsson on this matter.

***Question 7**: How do you envisage, the current reference wholesale offers in terms of the promotion of effective competition, of network development and of their coverage?*

A7: No comments from Ericsson on this matter.

***Question 8**: How do you foresee the evolution in retail demand for services (new services or similar services with greater bandwidth)? Do you see relevant limitations in terms of increasing bandwidth that enables the provision of these services to final consumers?*

A8: As per what was stated on the answer to the first question there are major trends in the provided services that will largely increase the bandwidth usage on access networks.

***Question 9**: What type of technical solutions (e.g. point to point or point to multipoint) and what type of development in terms of extension of the fibre optic network (FTTx) do you consider to be more viable in function of evolution of retail offers, density and location of area served, as well as the topology of existing network?*

A9: A serious recommendation on what fixed broadband access technology to use can only be done with detailed data on topology, available ducts, installation costs etc. at hand. In general, installation cost dominate the cost of fibre access build out, which gives CAPEX advantages to “Fibre to the cabinet” architectures, while “Fibre to the home” architectures tend to be simpler to maintain, hence often having OPEX advantages.

Both FTTC and FTTH architecture can be fed by point to point and multipoint (PON) fibre structures, and once again the choice of topology has to be based on a detailed study of the availability of ducts, vendor offerings etc.

As solution provider for both architectures Ericsson envisages business case for both and can state the following key advantages:

For point-to-multipoint solutions:

- Lower power consumption as *n* users share a single Laser at the exchange, so there are fewer active lasers and network processors at the exchange.
- Floor space savings due less central office equipment.

- Simplified upgrade with minimal disruption, insertion of optical coupler at exchange connected to new OLT allows for non disruptive upgrades i.e. current system runs on 1 Lambda and new system would run in parallel on a different Lambda. CPE can then be swapped gradually over time. For P2P the logistics of parallel Lambdas is complicated by volume of equipment so upgrades are expected to be disruptive.

For point-to-point solutions:

- Cost effectiveness for sparse uptake
- Allowing fibre to be decoupled i.e. wholesale access of fibre can be done

***Question 10**: As a network operator and provider of advanced services, do you expect to advance with the implementation of these solutions based on NGA? If so, with what solution(s), in what timeframe and with what geographical extension?*

A10: No comments from Ericsson on this matter.

***Question 11**: What technical restraints do you see in respect of coverage configuration choice and architecture for the various scenarios and solutions?*

A11: The answer to Question 9 states the main ideas that may constrain the deployment. A wide variety of points can be considered on the business case and there are technological approaches for all scenarios.

***Question 12**: Do you consider that there is sufficient information available on the access network (including PAs and hybrid or fibre optic loops) and on their short term evolution (in terms of network structure technologies and number of access points, etc.)? And what impacts do you see that this evolution will have on current offers?*

A12: No comments from Ericsson on this matter.

***Question 13**: Do you agree with the rule proposed, especially with the different periods of advance notice of structural alterations to the access network of the incumbent operator? Do you consider other measures to be necessary? Which measures?*

A13: No comments from Ericsson on this matter.

***Question 14**: From an economic standpoint and in view of foreseeable costs (e.g. fibre optic connection and adaptation or installation of street cabinets), do you consider an FTTCab solution to be viable just in larger capacity street cabinets and/or cabinets in large urban centre or, possibly, at a more general level?*

A14: The viability of a wider FTTC or FTTH deployment is dependent on the business case and competitive situation perceived by the operator.

***Question 15**: From a technical economic standpoint, do you favour a solution in which the street cabinets are individual (per operator) or a shared solution? Under what terms?*

A15: As a solution vendor Ericsson develops it's products to accommodate the wider range of deployment scenarios, therefore is our concern to cover in terms of solution both shared and stand-alone implementations, the concrete implementation is of course dependent on the operator's perceived business case.

***Question 16**: From an economic standpoint and depending on the expected costs (e.g. fibre optic connection to the home and possible adaptation of buildings to receive fibre optic), do you consider the development of fibre optic to be viable outside densely populated zones or new construction?*

A16: The viability of a wider FTTC or FTTH deployment is dependent on the business case and competitive situation perceived by the operator. Such business cases can be influenced by a wide range of factors and for technical ones Ericsson develops solutions to grant benefits to most deployment scenarios.

***Question 17**: What technical, administrative or legal challenges might hinder or limit the development of FTTCab or FTTH/B solutions? Identify any measure that might mitigate these problems?*

A17: Access to relevant locations and "right of way" issues may hinder deployment of new fibre access infrastructure. Hence legislation that facilitates for operators to locate active equipment at desired sites and to connect all apartments etc. to the infrastructure in one installation wave may stimulate fibre build out.

***Question 18**: What type of regulatory intervention do you consider necessary and appropriate to enable such solutions, while also being compatible with the objectives of regulation pursuant to national and community regulation?*

A18: No comments from Ericsson on this matter

***Question 19**: In what circumstances do you consider there are grounds for the imposition of obligations of fibre optic unbundling, in its various modalities (e.g. the entire fibre, wave length, etc.)?*

A19: No comments from Ericsson on this matter

***Question 20**: Do you consider it necessary, from a technical and functional point of view, to operate the current PSTN/ADSL (as of the exchange) and FTTx solutions (VDSL or fibre optic) in a given geographical zone in parallel? If so, for how long and under what conditions?*

A20: It is Ericsson belief that the time and conditions should be based on service take rate and commercial considerations. From our experience it is also important if the ILEC has a service obligation to meet.

***Question 21**: Do you consider that in Portugal there are conditions for the development of competing NGAs? With what degree of geographical coverage?*

A21: No comments from Ericsson on this matter

***Question 22**: Do you consider it suitable, in view of the state of the development of the markets and the characteristics of the access network, for there to be a single network supporting the products of all operators? What impact in terms of incentive for investment might be envisaged?*

A22: No comments from Ericsson on this matter

***Question 23**: What considerations are raised by a possible imposition of functional separation on the network of the incumbent operator?*

A23: No comment from Ericsson on this matter.

***Question 24**: What considerations are raised by the stated positions – although preliminary – taken by the NGAs, which appear to give priority, with respect to NGAs and in view of the alternative of applying immediate impositions of access to fibre optic loops, to the need to guarantee*
(a) greater transparency of information on the evolution of the network of the incumbent operator
(b) access already conceded for a reasonable period of time;
(c) the maintenance of access to the local loop only in the cases of loops in copper pair (possibly to the level of street cabinets); and
(d) access to conduits and backhaul for connection between street cabinets and the infrastructure of alternative operators?

A24: No comment from Ericsson on this matter.

***Question 25**: Do you consider that the current ORAC is sufficient for the development of NGAs by alternative operators? In which ways can improvement be made?*

A25: No comment from Ericsson on this matter.

***Question 26**: How do you see the inclusion of fibre optic loops in the (new) relevant market 4? Do you consider that, in the development of fibre optic loops, the same of type of constraints are identified as in the copper network? What regulatory implications result, in terms of obligations (currently imposed with respect to copper loops), particularly unbundling (complete or shared)?*

A26: No comment from Ericsson on this matter.

***Question 27**: Is it appropriate to consider, with respect to NGAs, a definition of markets segmented geographically within the Country or any geographical differentiation of regulatory obligations? How?*

A27: No comments from Ericsson on this matter

***Question 28**: What implications do you foresee for the regulatory measures proposed by the ERG in each one of the FTTCab and FTTH scenarios? What concrete measures do you propose for their implementation?*

A28: No comments from Ericsson on this matter.

***Question 29**: What alternative measures should be considered?*

A29: No comments from Ericsson on this matter

***Question 30**: Do you consider the current initiatives to provide network investment to be sufficient? What other regulatory initiatives or initiatives of the State do you consider could create a greater incentive to the development of the NGAs, promoting greater territorial coverage and info-inclusion?*

A30: No comments from Ericsson on this matter

***Question 31**: Are you of the position that networks promoted with recourse to public funds should function as open networks and exclusively for the provision of electronic communication services by third parties or, to the contrary, should be operated without restriction, as a way of promoting additional competition?*

A31 No comments from Ericsson on this matter.

***Question 32**: In this respect, how can a suitable incentive for investment and innovation be guaranteed, which, at the same time promotes competition without distortion and without endangering the sustainability of the operators which have invested in the development of the networks and in the OLL?*

A32: No comments from Ericsson on this matter

***Question 33**: Do you see constraints in the access to basic support infrastructure, including that of entities which are not operators of communication networks? What are they? What measures could be conceived to surmount them?*

A33: No comments from Ericsson on this matter.

***Question 34**: Do you consider it opportune to set out an alteration to the scheme for municipal fees for rights of way, and if so in what form?*

A34: No comments from Ericsson on this matter.

***Question 35**: Do you see particular problems in the implementation of HGA in the Autonomous Regions of the Azores and Madeira? If so, what, and what is the best way of resolving them?*

A35: As indicated before one of the main drivers for the build-out of an NGA network should be the operator's business case, for the Autonomous Regions the business case must contemplate an extra item that is the availability of connection to the mainland.

***Question 36**: What type of solutions for the development of fibre optic do you consider most appropriate? Do you consider that the current ORAC will allow operators to extend fibre optic in a widespread manner, for FTTCab solutions and, possibly, for FTTH/B solutions? What changes or improvements do you consider necessary with respect to the ORAC in order to accomplish this goal?*

A36: No comments from Ericsson on this matter.

***Question 37**: In view of the existence of a conduit access offer, do you consider the creation of a dark fibre offer by the incumbent operator to be necessary and justifiable? If so, in what situations?*

A37: No comments from Ericsson on this matter.

***Question 38**: In the event that another operator is the first to occupy the remaining capacity of the conduits in a determined geographical areas with installation of fibre network, does it make sense to oblige that operator to give access to the fibre in that geographical area? If so, under what conditions?*

A38: No comments from Ericsson on this matter.

***Question 39**: In a scenario in which due to a lack of conduit capacity in a determined geographical area, the obligation of access to fibre is imposed (in one of the technically viable alternatives) does it make sense to impose a point to point topology due to the greater facility and diversity of modalities of access?*

A39: No comments from Ericsson on this matter.

***Question 40**: Do you consider the legal and regulatory rules on access (e.g. in fibre optic) to buildings and the homes of customers by operators to be sufficient, particularly with respect to the incentives to share support infrastructure? If not, what alternative solutions do you propose, taking account of the restrictions imposed by the legal property regime governing apartments/condominiums?*

A40: No comments from Ericsson on this matter.

***Question 41**: What technical adaptation do you consider should be made with respect to the ITED, keeping in mind the existence of older buildings?*

A41: No comments from Ericsson on this matter

***Question 42**: Do you believe that the problems identified and resolved with respect to the ORALL have analogy with those regarding access to a fibre optic network?*

A42: No comments from Ericsson on this matter.

***Question 43**: Do you consider that specific measures are needed in order to protect the investment made with basis in the ORALL? If so why and what?*

A43: No comments from Ericsson on this matter.

***Question 44**: What alterations do you consider necessary in the broadband wholesale offer, in order to ensure a high level of coverage and capacity for differentiation? Do you consider access at the level of the DSLAM and/or Ethernet interface to be appropriate?*

A44: No comments from Ericsson on this matter.

***Question 45**: Do you think that the retail offer supported in the (future) RAPT will be able to compete, in terms of characteristics and coverage, with the offers supported in unbundled loops? For example, should the RAPT support the offer of IP-TV services by operators?*

A45: No comments from Ericsson on this matter.

***Question 46**: In the context of an FTTCab, what specifications do you think should be specifically considered in a possible VDSL bitstream offer?*

A46: No comments from Ericsson on this matter.