

Overview

We compliment TRAI for a comprehensive, well researched consultation paper on 'National Broadband Plan' and appreciate the opportunity to provide suggestions/comments on the same.

UTStarcom believes that widespread deployment of broadband services can bring tremendous benefits to society and to enable it, we have to focus not just on the right policy environment but also put tremendous focus on promoting public benefit under various schemes and programs.

UTStarcom feels that a unified network solution with optical fibre based core and aggregation transport network along with access agnostic broadband last mile solution would provide future proof network for India. The multiple access option would include Copper OSP (ADSL2+, VDSL), Fiber (FTTX-GEPON/GPON), Carrier Ethernet-PTN, Coax- EoC/HPNA, Wireless-WiFi Mesh, WiMax etc. An Optical Fibre based Packet Transport network would be a cost effective, multi-service, resilient, scalable, Secure, with high availability and end-to-end QoS solution.

The broadband penetration will be driven by the Video based application, which are critical to rural India considering the literacy rate. The multimedia application will require high bandwidth connectivity to provide on-line services viz. e-education, e-medicine, e-choupal etc., which can be provided only by a optical fibre network upto the village level.

In order to create National optical fibre core network extending upto villages, public private partnership (PPP) can be considered including Village Panchayat, other ministeries e.g. Min. of Surface Transport, HRD Ministry. A franchise model under BOT can be considered with funding from USOF, NREGA. Once the project is completed the PPP firm shall maintain the Optical Fibre network under well defined framework. This bandwidth on this high capacity fibre network may be leased out to service providers on demand on predetermined rates prescribed by the government/regulator. Revenue earned by this leasing operation may be shared between USOF and private partner.

Please find attached our specific comments against various questions under "Chapter Five: Summary of Issues for Consultation".

We will be happy to provide any further information in taking some of these recommendations forward.

Thanking You

CHAPTER 2: Broadband – Demand & Supply

5.1 What should be done to increase broadband demand? (Reference Para 2.23)

In order to increase the broadband demand in the country, we recommend the following steps:

1. Change Billing from Usage Based to Rental based Billing. (even GSM growth has been mainly due to fixed/rental/prepaid billing pattern)
2. Develop local eco system for BB applications such as - Tele Eduaction, Tele Medicine and Video on Demand, Video Calling.
3. Encouraging Local Hosting of the India centric Content would help reduce the Cost of the International bandwidth on the ISP, thus they would be able to offer lower tariff to the end customers.
4. ISP should be forced to reduce the average user utilization factor from current 1:50 to around 1:20 or less, this would increase the throughput to each customer without impacting them on the cost.
5. With the cost of OFC now coming less than Cost of Copper, any expansion of the current network should be necessarily be on fiber only. There should be some incentive provided to the service providers to lay fiber instead of Copper. With additional fiber in the ground, the issues of theft related to copper would also come down. OFC should be the medium of reaching out to the customer in the semi-urban and rural areas. Copper wire have their limitations and must be seen as temporary short term solution, Where as FTTC or FTTH is the long term solution for providing Broadband.
6. The usage of NIXI, nodes originally designed for Inter-routing of the local traffic between various domestic ISPs, should in be increased, so the local traffic from one ISP to another can be easily routed locally. This would in turn help pushing for the Local content hosting and ultimately bringing down the cost of bandwidth for the customer. because of lack of peering between ISPs, sometimes even the local traffic is also routed via International ISP, and thus choking the already scarce International bandwidth.
7. The ISPs in India act as bandwidth reseller instead of Network Operators. There is no effort made by them to reach out to the content owners locally, and optimize their networks accordingly.
8. Unbundling of the Local Loop specially in the metros, will help increase the utilization of the existing assets and increase the competition.

5.2 What, according to you, will improve the perceived utility of broadband among the masses? (Reference Para 2.23)

Same as section 5.1

5.3 What measures should be taken to enhance the availability of useful applications for broadband? (Reference Para 2.23)

1. Ubiquitous Access devices like TVs be allowed to connect to the internet as TV is already available in homes of most target users of broadband.
2. Government funds entrepreneurs to create more education related applications. Education should not be limited to only K-12 but should include adult education, vocational training, self paced education, women education, distance learning, healthcare related - taking care of babies, taking care of women who are expecting, etc.

5.4 How can broadband be made more consumer friendly especially to those having limited knowledge of English and computer? (Reference Para 2.23)

1. Using the IPTV and other applications which are more GUI oriented rather than text heavy
2. Use of remote controller rather than keyboard and mouse to access information on the internet, so that TVs can be used as effective on-demand information medium.
3. Use of more video based material to bridge the digital divide and the language barrier.

5.5 Do you agree with projected broadband growth pattern and futuristic bandwidth requirements? (Reference Para 2.35)

Yes, we do agree with the projected broadband growth patterns and futuristic requirements in the document.

1. With the launch of 3G and BWA services, the broadband penetration will increase substantially.
2. HD Video per channel will require 4-8 Mbps, thus fuelling the broadband bandwidth requirements.
3. The contention ratio of 1:50 appears to be very high. With introduction of real time application, a more reasonable contention ratio would be 1:20

5.6 Do you agree that existing telecom infrastructure is inadequate to support broadband demand? If so what actions has to be taken to create an infrastructure capable to support futuristic broadband? (Reference Para 2.35)

Yes, the existing telecom infrastructure is inadequate to support the broadband demands of the country.

An Optical Fibre based **Packet Transport Network** would be a cost effective, multi-service, resilient, scalable, secure, high availability and end-to-end QoS solution.

CHAPTER 3: National Broadband Network

5.7 What network topology do you perceive to support high speed broadband using evolving wireless technologies? (Reference Para 3.22)

A unified network solution with fiber based core and aggregation transport network along with access agnostic broadband last mile solution would provide future proof network for India. The multiple access option would include

- a) Copper OSP (ADSL2+, VDSL)
- b) Fiber (FTTX-GEPON/GPON)
- c) Carrier Ethernet-PTN
- d) Coax- EoC/HPNA
- e) Wireless-WiFi Mesh
- f) WiMax etc.

5.8 What actions are required to ensure optimal utilization of existing copper network used to provide wireline telephone connections? (Reference Para 3.22)

State owned Telcos (MTNL + BSNL) have 31 Million fixed line subscribers as per TRAI report June 2010 while they have more than 40 Million underground copper loops.

The table 3.1 clearly shows even in metro cities where BB penetration is maximum, hardly 15-29% copper loops had been used to provide BB connection.

The reason for such poor take-ratio may be attributed to the following:

- A. A sizeable percentage of copper loops had been laid long time back and the copper loop has degraded due to multiple joints and poor line maintenance; due to which loop performance is not suitable for BB data service.
- B. A sizeable percentage of subscribers are beyond 4-5 km from DSLAM which are declared TNF (technically not feasible)

The recommended solutions for such problems are:

A. **Improved Technology:**

There is improved filtering circuit available today which can be mounted in MDF to balance out the unbalance signal in the copper loops increasing the maximum data *Attainable data rate and improving the S/N ratio*. This also shall help in increasing the reach beyond 4 KM

The longer the copper loop, more it is susceptible to non-stationary impulse noise. With the traditional ADSL2+ technology the protection against impulse noise has an adverse effect on the serviceable reach and data rate, thereby limiting the service coverage area.

There is **better ADSL2+ technology available today which improves the robustness of DSL connections in longer loop** which are prone to non-stationary or impulsive noise without sacrificing the bandwidth. It helps to reduce total support calls by significantly lowering the number of cyclic redundancy checks (CRCs) and errors.

B. Copper curing and regular maintenance of copper loops: Poor quality copper loops may be acceptable for voice application but it may not be suitable for data application. All copper loops have to be physically inspected, tested and if required the loops need to be **cured for the defects like: Loose joints, bridged taps, and improper MDF termination**. Mostly the last mile copper loop maintenance is done by linesman who need to be trained and made accountable for up-keeping the lines.

The other alternative through which the copper loops can get back the life in tight time frame is allow the 3rd party to maintain the loops and get the share of revenue arranging out of data services BSNL earns out of the cured lines.

C. There is sizeable percentage of copper loops which are still beyond 4 km and BB services may be provided to these customers by bringing DSLAM nearer to home. This can be done by installing an Out Door Cabinet (ODC) DSLAM near the last mile distribution box. The last mile distribution box and the ODC need to be co-located. The challenge of maintaining the ODC shall be best done if this is outsourced on revenue sharing basis. .

5.9 Do you see prominent role for fibre based technologies in access network in providing high speed broadband in next 5 years? What should be done to encourage such optical fibre to facilitate high speed broadband penetration? (Reference Para 3.22)

Yes, we see prominent role for fiber based technologies in access network in providing high speed broadband in the next 5 years. The advantages of using optical fiber systems are:

- Higher Bandwidth Capacity
- Resistance to Outside Interference
- Longer Reach
- Lower Maintenance Costs
- Longer Life
- Better Reliability
- It provides the only true solution for existing and future requirements.

Optical fiber technology provides a higher capacity data transfer at very high speeds, enabling the community or service provider to supply a wide range of services and applications, such as High Definition TV (HDTV), Video on Demand (VoD) and high-speed data while providing the basic fundamentals of voice connectivity.

- Until a few years back the CAPEX of Fiber based communication was much higher than the Copper based wire line DSLAM. With the improvement of technology and mass adoption of fiber based access system, the cost of fiber based system today has comedown to the level of copper based system. More over the OPEX of fiber system is much lower than copper based system.
- Hence for the new deployment areas it would be more apt to go for fiber based system.
- The ROW is the main gating issue in the fiber deployment—this need to be addressed. The importance of ROW for fiber deployment needs to be given due importance. It should be considered as important as the water pipeline, underground electric cabling.
- Instead of issuing ROW to multiple service operators in the same route, Govt agency like municipality / village Panchayat should build up pipe line and own the optical fibers up

to the building. The capacity has to meet demand of 10 years and there should be provision of pulling extra optical cables in case of demand grows beyond installed capacity. The optical fibers may be given to operators on lease.

- Local hosting of more and more video based applications has to leverage advantage (bandwidth and robustness) of fiber access technology.
- Low cost CPE shall have major impact in popularizing fiber based access in rural areas

5.10 What changes do you perceive in existing licensing and regulatory framework to encourage Cable TV operators to upgrade their networks to provide broadband? (Reference Para 3.22)

We believe that there need to be licensing and regulatory changes to encourage Cable TV operators to upgrade their networks to provide broadband:

1. Right of Way: Single Nodal agency within a city jurisdiction should be set up to provide the right of Way.
2. Cost associated with acquiring interactive content should be brought low. With the increased availability of the affordable interactive content, this would also incentivize the MSO to upgrade their networks to deliver broadband.
3. Cable TV providers should be allowed to offer broadband services with minimal additional license fee.

5.11 Is non-availability of optical fibre from districts/cities to villages one of the bottlenecks for effective backhaul connectivity and impacts roll out of broadband services in rural areas? (Reference Para 3.39)

Yes.

The Video based application will be critical to rural India, considering the literacy rate. The multimedia application will require high bandwidth connectivity to provide on-line services viz. e-education, e-medicine, e-choupal etc.

The high bandwidth services can be provided only by an optical fiber network upto the village level.

5.12 If so, is there a need to create national optical fibre network extending upto villages? (Reference Para 3.39)

Yes.

5.13 In order to create National optical fibre core network extending upto villages, do you think a specialized agency can leverage on various government schemes as discussed in para B? (Reference Para 3.39)

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5.14 Among the various options discussed in Para 3.35 to 3.37, what framework do you suggest for National Fibre Agency for creating optical fibre network extending upto village level and why? (Reference Para 3.39)

1. Option mentioned in Section 3.3.6 considering public private partnership including Village Panchayat, other ministries e.g. Min. of Surface Transport, HRD Min.
2. A franchise model under BOT can be considered with funding from USO, NREGA
3. Considering the massive size of the project, it would help to generate funds through both the govt. and private agencies. The funds from the govt. agency could come from existing allocations (USOF & NREGA). This would also help generate rural employment.

5.15 What precautions should be taken while planning and executing such optical fibre network extending upto villages so that such networks can be used as national resource in future? What is suitable time frame to rollout such project? (Reference Para 3.39)

1. Planning of nationwide optical fibre network extending up to villages need to be done judiciously, ensuring long term availability of broadband capacity for multiple services and operators from common infrastructure.
2. While executing the national optical fibre network, the existing optical fibre network deployed by various government and private agencies should be taken in to consideration
3. It would be useful to create a national database of available optical fibre network, including type of fibre, fibre characteristics & total capacity, current utilization and available capacity etc.; so that this precious national resource can be used by all agencies in future.
4. The deployment of optical fibre network should be done in a phased manner with initially building national and state level network and then expanding into cities/villages over 3 year period.

CHAPTER 4: Regulatory Challenges and Future Approach

5.16 Is there a need to define fixed and mobile broadband separately? If yes, what should be important considerations for finalizing new definitions? (Reference Para 4.18)

Yes. The important considerations would be –

1. The CPE device size and Bandwidth handling capability
2. Application and services specific to fixed and mobile broadband

5.17 Is present broadband definition too conservative to support bandwidth intensive applications? If so, what should be the minimum speed of broadband connection? (Reference Para 4.18)

Yes the present Broadband definition of 256 Kbps is too conservative and there is a need to define and distinguish broadband over wire and wireless medium.

On wired medium, the minimum speed should be 3-4 Mbps while on the wireless medium, speeds above 1 Mbps should be considered BB

5.18 What specific steps do you feel will ease grant of speedy ROW permission and ensure availability of ROW at affordable cost? (Reference Para 4.30)

1. Single agency to grant ROW on National & State highways, city & village road
2. Prevent repeated digging and ROW charges by maintaining a unified database of existing ducts
3. Sharing of optical fiber duct/cable by different operators

5.25 How can use of domestic and international internet bandwidth be segregated? Will it have direct impact on broadband affordability? If so, quantify the likely impact. (Reference Para 4.42)

1. As much as possible, domestic internet bandwidth should be used - there is need to encourage hosting of content and websites within the country.
2. These contents and websites could be mirrored in the operator networks - this way, we can reduce the usage of expensive international internet bandwidth and pass it on directly to the customers.

5.26 What steps should be taken to bring down the cost of international internet bandwidth in India? (Reference Para 4.48)

1. In-country hosting of international content.
2. Creation of a centralized content delivery network with multi points of presence.
3. Encouraging local content creation or encouraging international content owners to create content in the local language and host it locally.
4. Working with content owners on more revenue share as opposed to big upfront costs for content.

5.27 How can competition be enhanced in the International bandwidth sector? (Reference Para 4.48)

We can enhance competition in the international bandwidth sector by allowing international carriers to compete and offer services in India.

5.28 QoS of broadband, availability of bandwidth, adherence to given contention ratio, affordability, availability and spread are some intricately linked parameters.

In your opinion what should be done to ensure good quality broadband to subscribers? (Reference Para 4.59)

1. Use QoE parameters instead of QoS for Video communications.
2. Set a maximum limit to Contention ratio for the operators, say 1:20 for even the domestic consumption.
3. Use fiber to increase the spread of the broadband in rural India.

5.31 What measures do you propose to make Customer Premises Equipment affordable for common masses? Elaborate your reply giving various options. (Reference Para 4.64)

1. Agree on a integrated device for voice, video and data
2. Work on local manufacturing/ technology transfers.
3. Create supply to benefit from the economies of scale
4. Make broadband mandatory for all households - give it away for free and use the advertising model to recover the costs. (use of cross subsidization methods)
5. Provide economic benefits to cable operators to push broadband in a big way - use of HPNA, EoC, GEAPON etc.
6. Ensure proper planning and reducing the cost of right of way.
7. Create incentives to wireless operators to make investments in broadband