

Our Ref: VNOAI/REG/TRAI-Cp/

Date: 28.01.2020

The Advisor

Networks, Spectrum and Licensing (NSL)

Telecom Authority of India

Doorsanchar Bhawan,

Old Minto Road,

New Delhi-110001

Sub: Submission of reply to the Pre consultation paper "Enabling Unbundling of Different Layers Through Differential Licensing" dated 09.12.2019.

Dear Sir,

Please find herewith our suitable reply in response to above subject on the Pre-Consultation paper on "Enabling unbundling of Different layers through Differential licensing" for consideration.

Best Regards

For Virtual Network Operators Association

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VNOAI's Response to the Pre-Consultation Paper on
Enabling Unbundling of Different Layers Through Differential Licensing

Introduction

1. The aim of every Telecom Network technology post 2G has been to enable development, deployment and availability of services that are delivered by utilizing the network, i.e. over the network. **However, the existing regulatory regime is based on the voice based networks and needs to be aligned to the modern day data predominant networks.**
2. QoS apart, each progressive generation of telecom network service also enabled an entire eco-system of services. The technological enhancements also lead to the requirement of reducing time for tweaking the existing services as per newer requirements. Even the launching of a new and innovative service too has got telescoped thus leading to evolution of computing enhancements such as Network Function Virtualization (NFV) and Software Defined Networks (SDN). **Each network technological advancement viz, 3G, 4G, 5G, NFV, SDN have been directed towards enhancing the QoS experience for the digital services being provided over the network.**
3. M2M / IoT services are a solution-oriented service that is provisioned by amalgamating together the eco-system of the services that evolved due to the technological enhancements in the telecom networks. This evolution of individual services implies that the IoT service has to be viewed as a layered service. Though, each layer has its own independent nuances however, for forming a holistic service these layers have interdependencies on each other. The earlier regulatory regime was based on voice centric networks wherein the services were integral to the network whereas **with 5G there is a need to effect a paradigm shift of regulatory thought process from being network centric to services centric.** Accordingly, there is a teething need for revisiting the existing licensing and regulatory regimes of the voice centric networks and splitting them into multiple layers to create the environment conducive for enabling innovative digital services. **The suggested layers for services either by light touch licensing or simple Registration are as follows,**
 - a. **Network Infrastructure Services layer.** This layer would comprise of the physical infrastructure, active and passive elements and cloud based instances of the network elements that are required to be deployed in a telecom network.

- b. **Network Services Layer.** This layer would be associated with selling only the basic native network services viz, Voice, Messaging and Data connectivity.
 - c. **Digital Services layer.** This layer would entail a substantial value addition to the basic native network services viz, Voice, Messaging and Data connectivity, before selling these network native services as a bundled service, e.g. IoT Services, OSP services, etc.
4. Implementation of this layered concept would require a major shift in the thought process of sale of the native services of the network viz, **voice, messaging and data wherein these services would be considered as the product of the Network Infrastructure layer.** Just as a product manufacturer sells its products through dealers / retailers, similarly the **products of this layer would be sold (Not re-sold), on a non-discriminatory basis, only through DoT registered dealers / retailers. i.e. Network Services Providers (NSPs) and Digital Services Providers (DSPs).** The NSPs and DSPs would source these services from the NISPs in bulk for sale to their customers.

Q1. In your view, what could be the possible benefits and anticipated problems in having an unbundled licensing regime? Kindly suggest the measures that can be taken to overcome the anticipated problems (if any).

Our Answer

1. The **envisaged advantages** of the layered / unbundled approach to licensing / registration as described in the introduction above are as given below,
 - a. Simplification of accounting and taxation process as it involves only selling and no re-selling of services.
 - b. Simplifies the auditing process and prevents chances of under reporting as the sale of services would be accounted for and corroborated at multiple layers.
 - c. Lends itself to light touch regulations for the entire multi-layered services eco-system.
 - d. Can facilitate investment into the network infrastructure by multiple (Upper Layer) service providers instead of only the network Infrastructure services providers.
 - e. Enhances competition for retail of services as larger number of players can be accommodated.
 - f. Lends itself to maximizing the capacity utilization of the infrastructure leading to better ROI for the capex infused into infrastructure building.
 - g. Lends itself towards provisioning of services without any discrimination / biases.

- h. Creates a homogeneous environment conducive for innovation in the entire digital services eco-system.
- i. Creates an environment for better and focused security control through mandated implementation of security by design principle.
- j. Lends itself for faster and better evolution of innovative technology services and their adoption.
- k. Would facilitate faster and better implementation of the government's Smart City and other Digital programs.

2. Envisaged Challenges

- a. **Change in mindset from the existing concept of sale and resale of services to just sale of services as a product of the respective layers.**
- b. **Permitting services tariff definition by the NSPs and DSPs.** The service utilization measurement metric for the consumption of network and digital services would be based on consumption of voice calls, number of messages and data volume, i.e. the product of the Network Infrastructure layer. Consequently, definition of the tariff by the NSPs and DSPs is required to be permitted as an independent activity without looking it through the prism of re-sale of services.

Measures that can be taken to overcome this challenge:

Elimination of the concept of re-sale of services will lend itself to levying of only GST as the tax on the services of each layer. Consequently, NSPs and DSPs can define their respective tariffs and pay the GST without any apprehension of evasion of taxes by any layer of the digital services eco-system.

- c. **Requirement of closer interdepartmental co-ordination for digital services policy formulation.** Development and deployment of services over the network would necessitate close coordination between the policies formulated for each layer lest restrictions imposed in one layer inhibit innovation in the other layers. E.g. MoRTH came out with its Gazette Notification for safe public transportation viz, Automotive India Standard 140 (AIS 140), on 28 Nov 2016, wherein provisioning of dual subscription eSIM was mandated for public transport vehicles. But the supporting guidelines for eSIM from DoT were issued only in May 2018. Consequently, the TSPs i.e. the licensees of DoT,

were reluctant to support the dual subscription SIMs fearing penalization by the licensor later.

Measures that can be taken to overcome this challenge:

- i. DoT and TRAI to be compulsorily informed and kept in loop during the deliberations for any digital service being envisaged by different ministries / government agencies.
 - ii. DoT & TRAI to start a parallel the consultation process with the relevant stake holders.
- d. **Super-imposition of Existing Policy Guidelines on Newer Concepts / other services layers.** TRAI, DoT and the industry stakeholders did sustained deliberations over a substantial time and the VNO guidelines were issued but on ground VNO's have failed to takeoff. From the policy perspective, it is felt VNO's found it challenging to work out a tangible business case due to the following policy guidelines that were replicated, thus imposed, from the existing licensing guidelines.
- i. Non-permission of Multi-Parenting.
 - ii. Dual taxation due to non-availability of pass through on account of payments of LF by NSO and VNO on the same component of revenue, DOT amended the VNO license lately to make it at least viable.
 - iii. Still the high cost of Bank Guarantees prescribed in the VNO licenses are making the VNO business unsustainable.
 - iv. Prescribing the presumptive 10% of entry fee as License Fee for VNOs in spite of the fact that till date no revenues are generated and thus drained all the resources of VNOs for paying License Fee on AGR. In this hyper competitive Indian market such provisions by governmental for maximization of revenues are a show stopper for existing VNOs and prevented new business entity(s) to opt for becoming a VNO.

Moreover there are policy paralyses for VNO Licensees that the UL-VNO Licenses were issued without giving thought on enabling the policies which can enable a business entity having invested on the UL-VNO license can start the services to earn revenues. DOT had to go through the lengthy processes to amend the UL-VNO Licenses two times. But still there is lacuna in the policy which is due to no Mandate to the NSOs the VNOs are not able to start the services.

- v. Moreover technologies and TRAI regulations are changing rapidly as recent 7th Amendment of MNP Regulation implementation was also a challenge thus DOT had to amend the UL-VNO License again to issue the LRN .
- vi. Thus it is imperative that for any policy to succeed it has to be futuristic and aligned with the technologies which are prevalent globally.

Formulation of policies for newer concepts cannot and should not be based on the template of existing services.

- i. A more liberal and open environment needs to be created for mushrooming of innovative services by the young fertile minds.
- e. **Indulgence in anti-competitive practices by the Network Infrastructure Services Providers (NISPs).** Voice, Messaging and Data services are the blood line for the digital services. In case NISPs' refuse or even cause selective delay in provisioning / configuring their services, the enablement of the services over the network get affected accordingly. Such anti-competitive practices of the NISPs would inhibit proliferation of Digital services in the country.

Measures that can be taken to overcome this challenge: Declaring Network Infrastructure Services as 'Bottleneck Services' and hence mandating time bound provisioning and configuring of Network Infrastructure Services that are requisitioned for developing and delivering the services over the network by the NSPs and DSPs.

Our Recommendations

1. There is a immediate need for revisiting the existing licensing and regulatory regimes of the voice centric networks and splitting them into multiple layers to create the environment conducive for enabling innovative digital services.
2. Suggested layers of licensing are
 - a) Network Infrastructure Services Layer,
 - (b) Network Services Layer
 - (c) Digital Services Layer.
3. Voice, Messaging and Data services should be considered as the product of the Network Infrastructure layer which would be sold (Not Re-Sold), on a non-discriminatory basis, only

through DoT registered dealers / retailers. i.e. Network Services Providers (NSPs) and Digital Services Providers (DSPs).

Q2. In case it is decided to unbundle the different layers of licensing,

(a) what should be the different layers and their scope? What changes would be required in licensing regime to enable such a framework?

(b) Should there be a new regime of licensing on which the existing licensees should migrate within a specified time frame or there should be a parallel incentivized licensing regime for unbundled layers of license?

Our Answer

1. The very fact that modern telecom technologies, especially 4G onwards, are totally oriented towards providing enhanced and faster service experience of the digital services that are provided over the network.
2. It thus warrants a change in the erstwhile licensing regime which is based on voice centric networks. Other aspects necessitating a change to layered / unbundled licensing regime for Globally prevalent modern day digital technologies duly explained in detail in our response to Q1 above.

As proposed in the response to Q1 above, the licensing regime should be split into the 3 layers :

- Network Infrastructure Services layer
- Network Services layer
- Digital Services layer.

The scope of these layers has been described in detail in the paragraphs later in response to Question-1 above.

3. Such a layered approach would require the following major changes in the existing licensing regime :-
 - a. Complete separation of the telecom infrastructure from telecom services thereby aligning with modern day technological requirements.
 - b. The network's native services viz, voice, messaging and data to be considered as a product of the Network Infrastructure Services layer.

- c. Doing away with the concept of re-selling of telecom services. Services layers above the network viz, Network Services Layer and Digital Services Layer, would be selling (and not re-selling) the product of the Network Infrastructure Services Layer either as it is or with due value add as part of a bundled service.
 - d. Only the infrastructure layer would be provided under a license from DoT. The services would be provided by service providers who are registered with DoT not like UL-VNOs which are heavily loaded with legacy prescribed licensing and License Fee requirements so that they are able to sustain in a highly competitive telecomm market.
 - e. Levying of an administrative fee of 1% of the annual audited revenues of the Network Infrastructure Services Provider (NISP) instead of LF or SUC.
 - f. Only GST to be levied on the services provided by the NSPs or the DSPs.
4. **Network Infrastructure Service Provider.** This layer would comprise of the physical infrastructure, active and passive elements and cloud based instances of the network elements that are required to deploy a telecom network.
- a. **Scope:** It is proposed that the scope of this layer should be as follows:
 - i. Physical towers.
 - ii. RAN.
 - iii. OFC / Copper based terrestrial network.
 - iv. Submarine Cable Network and the Cable Landing Stations.
 - v. Satellite Uplink and Downlink stations.
 - vi. Gateway elements.
 - vii. Associated spectrum.
 - viii. Subscription Management.
 - ix. Bulk Tariff definition of services.
5. **Network Services Provider.** The Network Services Providers (NSPs) would be associated with selling only the basic network services viz, Voice, Messaging and Data connectivity. They would be permitted to sell these services to retail as well as the corporate (Bulk Usage) customers who requisition the services for their own end usage only.

- a. **Scope:** It is proposed that the scope of this layer should be as follows:
 - i. Infrastructure Deployment: NSPs should be permitted to augment the complete network infrastructure of the NISPs, as listed at para 2 above, except the gateway elements for interfacing with other NISPs.
 - ii. Sale of Services: The NSPs would have a B2B contractual arrangement with the NISPs and should be at liberty to sell these services to retail / corporate customers. Selling of these services shall not be construed as resale of the Network Infrastructure Services, albeit it should be viewed as a separate layer that is selling the product of the Network Infrastructure Layer.
 - iii. Tariff Definition: NSPs should be mandated to define the tariff of its services as per TRAI's tariff regulations issued from time to time for NSPs.
 - iv. Subscription Management. NSPs too can be entrusted with subscription management in terms of hosting the SMDP – SMSR infrastructure.
6. **Digital Services Provider.** The classification of Digital Services Providers (DSPs) would be that they do a substantial value add to the basic network services viz, Voice, Messaging and Data connectivity, of NISP before selling it as a bundled service to the DSPs customers.
 - a. **Scope:** It is proposed that the scope of this layer should include the M2M / IoT Service Providers and Other Service Providers (OSP).
 - i. Infrastructure Deployment: DSPs may be permitted to augment the network infrastructure of the NISPs only within a limited campus area / within a building.
 - ii. Sale of Services: The NSPs would have a B2B contractual arrangement with the NISPs and these services would be sold as a component of the bundled services of the DSP.
 - iii. Tariff Definition: DSPs should be mandated to define the tariff of its bundled services.
 - iv. Subscription Management. DSPs can be entrusted with subscription management in terms of hosting the SMDP – SMSR infrastructure.

Our Recommendations

There should be a revamp of current legacy licensing regime to new regime of light touch licensing and registration on which the existing licensees should migrate within a specified time frame.

Q3. In case you are of the opinion that there is no need of unbundling of different layers of the license, what changes should be made in the existing licensing regime to (i) promote sharing to increase utilization of the existing resources, and (ii) catalyse investments and innovation in Digital Communications sector?

Our Response and Recommendations

There is a need of unbundling of different layers of the license, for which due changes should be made in the existing legacy licensing regime.

Unbundling of the licensing shall promote sharing to increase utilization of the existing resources as well as it shall catalyse investments and innovation for the rapid growth of Digital Communications sector.

Q4. What other reforms / changes are required in the existing licensing regime?

Our Answer

1. **Bottleneck Service.** Network Infrastructure services viz, voice, messaging and data volumes are required to be classified as 'Bottleneck Services' and bulk provisioning and configuring of the same under a B2B agreement, for provisioning digital services, should be mandated with reasonable base commercial terms. To realize the aim of Digital India, this is important for the development of innovative applications for digital services, especially for M2M / IoT / Smart City kind of applications.

Our Recommendation

1. *Network Infrastructure services viz, voice, messaging and data volumes are required to be classified as 'Bottleneck Services' and bulk provisioning and configuring of the same under a B2B agreement, for provisioning digital services, should be mandated with reasonable base commercial terms.*

Benefits of unbundling 5G Licenses

India is a vast country with enormous population. Physical proximity has always been a challenge to the people. Be it some personal crisis or a business need, to reach the different corners of the country had taken days and months. But things have changed with the help of telecommunication.

The Telecom Policy 1994 which marked the clear intention of the government to liberalize the sector and its objective of providing world class telecom facility to its citizen. The policy tried to curb the setback of the licensing process and other

issues. The policies mentioned high objectives and it was realized that to achieve them the resources required would be insufficient without the private sector.

So to bridge the resource gap, the basic services of telecom sector were also opened to the private sector (TRAI, Telecom Sector in India:A Decadal Profile, 2012). However, the major telecom revolution of India came with New Telecom Policy, 1999 (NTP).

This opened up all segments of the telecom sector to the private players from selective privatization. In addition to this it also mentioned the strengthening of regulatory regime and restructuring of departmental telecom services. As the private sector was allowed to operate in the industry it became essential to have an independent regulatory authority. Thus, the Telecom Regulatory Authority of India

(TRAI) was set up in 1997. This body is responsible for the regulation of telecom services that include fixing or revising tariffs. (TRAI, 2012)

The growth and penetration of telecommunication have not only improved the general communication but also have improved different sectors of the economy. The communication sector is now so important that it is considered to be the part of the basic infrastructure for individual and business requirements. This is because of the network externalities due to which the value of the services increases with more number of users .

Indian Telecom Industry has provided spectacular economic benefits. Directly it has increased the GDP of the country, earnings of the government and employment to the Indian citizens. Apart from these there are benefits which

have been obtained indirectly. Dissemination of information is the most important input of the improved telecommunication in Indian economy. As the information collection became less

expensive in terms of time and money, cost of business eventually came down. There has been drastic reduction in transaction costs. Advancement of telecommunication has fostered developments in the banking, financial services, digital commerce, education and health services.

5G Launch in India is Gated

With the evolution of radio technology and cellular system in the 1980s, the evolution of digital wireless communication took place. From the development of 1G (FIRST GENERATION) in the 1980s, 2G (SECOND GENERATION) in 1990s, 3G (THIRD GENERATION) in 2000s, 4G (FOURTH GENERATION) in 2010s and now 5G the advancement towards smarter technology is taking place. 5G or 5th generation is the upcoming advancement made in the field of mobile communication. It aims at a higher capacity than the existing 4G network. The operating range of 5G network lies in the millimetre wave bands of 28,38 and at a frequency of 60GHz. With reduced latency compared to LTE, data rates of 100 megabits and downloading speed of 1 GB per second 5G focuses on revolutionizing the field of communication with improved signalling efficiency and improved coverage speed. Apart from providing faster speeds, high downloading speed 5G will also be used in other fields like the Internet of Things (IoT), broadcast services and in communication for a natural disaster. With the implementation of 5G, the new area research has been introduced to the researchers all around the world.

The model of 5G is an IP based model for all the wireless networks. The model consists of the user terminal which is the main part of the 5G architecture. The user terminal consists of autonomous radio technologies. The function of the radio technology is to act as an IP link for the internet. The purpose of IP design is to ensure control data for routing of IP packets related to application connections i.e. interfacing between user and applications and servers on the internet. The key technology behind the working of 5G architecture is the Master Core Technology.

Master Core Technology is the converging point for other technologies in the wireless network. The architecture of Master Core technology allows it to operate in the parallel multimode including all IP network and 5G mode. The main features of 5G and network mode are it controls

all the network of.RAN (Radio access networks) and Different access networks. The compatibility feature of this technology makes it more efficient and more powerful.

Current issues being faced for the Launch of 5G are funds scarcity and low fibre backhaul for the deployment of the next gen technology in India. There are not sufficient number of towers than are connected to fibre backhaul.

Proposed solution

The network capabilities added through network slicing in the 5G environment is expected to allow telcos to offer 'made to order' solutions for their customers. Complemented by Software Defined Networking (SDN) and Network Functional Virtualization (NFV), telcos could be able to deliver the network customized to customer needs and deploy such networks in quick time with reduced capex and opex requirements. This is expected to enable telcos to try various service offerings at low cost with faster time to market, fostering innovation. Telcos are seen forging partnerships across the value chain to explore opportunities for new services leading to new business models and intermediaries.

Intermediaries for connectivity:

Prerequisite for 5G is network densification of existing 4G/ LTE networks. Further, through use of various technologies such as small cells, IBS, DAS, Wi-Fi telcos are seen building heterogeneous networks, which can provide the required network coverage. This need has given rise to opportunity for OEMs to offer 'small-cell-as-a-service', 'hetnet-as-a-service', which are networks deployed and managed by OEMs utilized by telecom service providers to densify their network there by enabling 4G expansion and prepare for impending launch of 5G.

Intermediaries for network infrastructure: Cloud companies and tech start-ups have emerged providing network infrastructure resources for computing, storage and processing as well as network functions such as security, firewall, load balancing, software-defined WAN, big data analytics etc. to customers. 'Network-as-a-service' offered by these set of intermediaries is finding takers in small and medium scale enterprises with no or minimal investments in their IT network.

Intermediaries based on differentiated services: With the range of 5G use cases across industry verticals requiring different characteristics for example, low latency and high reliability application for robotics in manufacturing and automotive sectors; high data

throughput requirements for augmented reality use cases; the traditional offerings based on connection speed and volume of usage could see a shift. Basis the service provider's ability to make this shift to have offerings for relevant niche industry verticals as well as tariffs customised to offering type, there is an opportunity for intermediaries. Downstream to telecom service providers, these intermediaries could acquire bandwidth from the telecom service providers based on defined SLAs for throughput, latency, reliability etc. and create differentiated services/ applications based on niche industry vertical they want to cater to with suitable tariffs to meet the customer needs.

The Japan 5G Model

NTT Docomo chief technology architect Seizo Onoe said given the significant investment required to build the networks, 5G will need something new and its priority is on creating new business models.

He called for 5G to be a platform for cross-industry collaboration, which he insists is the key to making the next-generation technology a success. More than 2,600 companies signed up to Docomo's 5G open partner programme.

Summary

1.The Indian government's ambitious plan to deploy commercial fifth-generation (5G) technology starting 2020 appears to be under serious threat

2.5G Auction is delayed due to ongoing industry stress including but not limited to the Adjusted Gross Revenue fiasco. The Indian Telco's are under massive financial stress.

3.There is a need for Non Telco Private players in 5G deployment.

eg E-commerce group Rakuten, Japan's newest wireless carrier, partnered with information technology group NEC to install roughly 16,000 low-cost fifth-generation base stations across the country over five years.

4. Recognizing the need, International standardization body, ETSI, has taken the initiative for Standardization of Private LTE

5. DoT has initiated, TRAI has recommended and Digital Communication Commission has endorsed TRAI's recommendation for the registration of M2M Service Providers

6. Unbundling 5G Licenses can provide the perfect and fertile ground for new business model and service innovation in key areas exemplified below, which are necessary to give Indian innovation and economy a chance to flourish the same way as the ICT / BPO industry flourished and grew in the '90s.

- neighborhood based 5G services such as in housing societies

- Industrial IoT Solutions for Campuses such as Airports, Manufacturing facilities

- Health Services is hot spots

- 5G LPWAN services for Mining, Forested and Remote Areas