

Consultation Paper No. 7/2020



**Telecom Regulatory Authority of
India**



Consultation Paper

on

Enabling Unbundling of Different Layers Through
Differential Licensing

20th August 2020

Mahanagar Doorsanchar Bhawan

Jawahar Lal Nehru Marg,

New Delhi- 110002

Written Comments on the Consultation Paper are invited from the stakeholders by 17th September 2020, and counter-comments by 1st October 2020. Comments and counter-comments will be posted on TRAI's website: www.trai.gov.in. The comments and counter-comments may be sent, preferably in electronic form, to Shri Syed Tausif Abbas, Advisor (Networks, Spectrum and Licensing), TRAI, on the email ID advmn@traigov.in. For any clarification/ information, he may be contacted at Telephone No. +91-11-23210481.

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CHAPTER 1

INTRODUCTION

A. DoT Reference

1.1 The Department of Telecommunications (DoT) through its letter No. 20-281/2010-AS-I Vol.XII (pt) dated 8th May 2019 (**Annexure I**), inter alia, informed that the National Digital Communications Policy (NDCP) 2018, under its 'Propel India' mission, envisages one of the strategies as 'Reforming the licensing and regulatory regime to catalyse Investments and Innovation and promote Ease of Doing Business'. Enabling unbundling of different layers (e.g., infrastructure, network, services, and application layer) through differential licensing is one of the action plans for fulfilling the aforementioned strategy. Through the said letter dated 8th May 2019, DoT, inter alia, requested TRAI to furnish recommendations on enabling unbundling of different layers through differential licensing, under the terms of the clause (a) of sub-section (1) of Section 11 of the Telecom Regulatory Authority of India Act, 1997, (as amended) by TRAI Amendment Act, 2000.

B. Indian Telegraph Act, 1885

1.2 The grant of telecom licenses in India is primarily governed by the Indian Telegraph Act, 1885, and the Indian Wireless Telegraph Act, 1933. These Acts provide an exclusive authority to the Central Government for establishing, maintaining, and working telegraphs, and wireless telegraphy equipment, and to grant licenses for such activities.

1.3 The Indian Telegraph Act, 1885, defines "Telegraph" as under:

"Telegraph" means any appliance, instrument, material or apparatus used or capable of use for transmission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, visual or other electro-magnetic emissions, Radio waves or Hertzian waves, galvanic, electric or magnetic means.

1.4 Section 4 of the Indian Telegraph Act, 1885, provides exclusive privilege to the Central Government in respect of telegraphs, and power to grant licenses. The relevant portion of the section 4 is reproduced below:

“4. Exclusive privilege in respect of telegraphs, and power to grant licenses.

(1) Within [India], the Central Government shall have exclusive privilege of establishing, maintaining and working telegraphs:

Provided that the Central Government may grant a license, on such conditions and in consideration of such payments as it thinks fit, to any person to establish, maintain or work a telegraph within any part of [India]:

Provided further that the Central Government may, by rules made under this Act and published in the Official Gazette, permit, subject to such restrictions and conditions as it thinks fit, the establishment, maintenance and working–

(a) of wireless telegraphs on ships within Indian territorial waters [and on aircraft within or above [India], or Indian territorial waters], and

(b) of telegraphs other than wireless telegraphs within any part of [India].

...

(2) The Central Government may, by notification in the Official Gazette, delegate to the telegraph authority all or any of its powers under the first proviso to sub-section (1). The exercise by the telegraph authority of any power so delegated shall be subject to such restrictions and conditions as the Central Government may, by the notification, think fit to impose.

....”

C. Evolution of Telecom Licensing Framework in India

1.5 Licensing framework has been an integral part of India’s telecommunication law. Under the Indian Telegraph Act, 1885, section 4 gives Government the power to grant licence to any person for

establishing, maintaining or using a telegraph. Initially, telecom services were provided by the Indian Post & Telecommunication Department (IP&TD). In 1985, DoT was separated from Indian Post & Telecommunication Department. DoT was responsible for telecom services in the entire country until 1986 when Mahanagar Telephone Nigam Limited (MTNL) was established to run the telecom services of metro cities (Delhi and Mumbai)., The erstwhile Overseas Communication Services (OCS) was converted into Videsh Sanchar Nigam Limited (VSNL) in 1986 for international long-distance operations. However, in the telecom sector, the Government had complete monopoly only until the early 1990s.

- 1.6 In 1994, the Government announced the National Telecom Policy (NTP), which defined certain important objectives, including availability of telephone on demand, provision of world-class services at reasonable prices, ensuring India's emergence as a major manufacturing/export base of telecom equipment, and universal availability of basic telecom services to all villages. In order to implement NTP 1994, suitable arrangements were made to protect and promote the interests of the consumers and ensure fair competition, and the Indian Telecom Sector was liberalised in 1994. NTP 1994 was the first step towards deregulation, liberalization and private sector participation in the telecom service sector.
- 1.7 The Government invited private sector participation in a phased manner, initially for value added services and Cellular Mobile Telephone Services (CMTS), and, thereafter, for Fixed Telephone Services (FTS). In the first phase of liberalization, mobile telephone service started with the issue of 8 licences for CMTS in four metro cities: Delhi, Mumbai, Calcutta, and Chennai, to 8 private companies in November 1994 (through a bidding process to get the highest License Fee bidder). Subsequently, 34 licences for 18 Territorial Telecom Circles were issued to 14 private companies during 1995 to 1998. In the year 1997-98, six Licenses were granted by way of bidding through tender for providing

basic telecom services. (Fixed License Fee). In November 1998, the Internet sector was opened to Private Operators for providing Internet services.

- 1.8 In 1999, New Telecom Policy was released, which aimed at rapid expansion of tele-density. It focussed on the provision of universal service to all uncovered areas, including the rural areas, and the provision of high-level services capable of meeting the needs of the country's economy. It also set the objective for creation of a modern, and efficient telecommunications infrastructure taking into account the convergence of IT, media, telecom, and consumer electronics, and thereby propelling India into becoming an IT superpower. It also allowed for the migration of the licensees from a Fixed Licence Fee Regime to a Revenue Share Arrangement Scheme (w.e.f. 1st August 1999). Under the new scheme the licence fee is collected as a percentage of the service provider's revenue. Previously, there were two operators in each circle, and the 1999 Policy allowed the Government's PSUs as the third operator in the circle.
- 1.9 Third and Fourth CMTS licence: The Government granted MTNL a licence in 1997 for Delhi and Mumbai service areas, and BSNL was licensed as the third cellular mobile operator in the year 2000 for all service areas except Delhi and Mumbai. A fourth Cellular Mobile Service provider was introduced in 2001, through a multi-stage bidding process. 17 new CMTS Licenses were issued for a period of 20 years in the four Metro cities and 13 Telecom Circles. NLD and ILD services were opened up for private operators in 2000 and 2002, respectively.
- 1.10 In November 2003, the Government introduced the Unified Access Service License (UASL) regime. The UASL permitted an access service provider to offer both fixed and/or mobile services under the same licence, using any technology. Licenses under UASL were given in the years 2003, 2004, 2006, 2007, and 2008 following the principle of First Come First Served (FCFS).

- 1.11 In the year 2010, the 3G and BWA spectrum was auctioned. Subsequently, through National Telecom Policy 2012, Government announced delinking of spectrum from license.
- 1.12 National Telecom Policy, 2012, was issued by the Government in June 2012. One of the objectives of the NTP, 2012, was to simplify the licensing framework, and to strive for the creation of One Nation – One License across services and service areas. That is, to move towards Unified Licence regime in order to exploit the attendant benefits of convergence, spectrum liberalisation, and facilitate delinking of the licensing of Networks from the delivery of services to the end users in order to enable the operators to optimally and efficiently utilise their networks and spectrum by sharing active and passive infrastructure.
- 1.13 The Government decided to implement this regime in two phases, in the first phase, UL regime was introduced in 2013, and in the second phase, towards the delinking of licensing for networks from the delivery of services, a new category of Unified License (Virtual Network Operator) was introduced in 2016.
- 1.14 Unified Licence regime came into being in 2013. The allocation of spectrum was delinked from the licence and it has to be obtained separately as per the prescribed procedure, i.e., bidding process. Only one Unified License is required for all telecom services in the entire country. The service provider may choose the services to be offered, which is called Service Authorizations. Authorization for various services, as contained in UL, are mentioned below:
- a) Unified Licence (All Services)
 - b) Access Service (Service Area-wise)
 - c) Internet Service (Category – A with All India jurisdiction)
 - d) Internet Service (Category – B with jurisdiction in a Service Area)

- e) Internet Service (Category – C with jurisdiction in a Secondary Switching Area)
- f) National Long Distance (NLD) Service
- g) International Long Distance (ILD) Service
- h) Global Mobile Personal Communication by Satellite (GMPCS) Service
- i) Public Mobile Radio Trunking Service (PMRTS)
- j) Very Small Aperture Terminal (VSAT) Closed User Group (CUG) Service
- k) INSAT Mobile Satellite System-Reporting (MSS-R) Service
- l) Resale of International private Leased Circuit (IPLC) Service

Authorization for Unified License (All Services) covers all services listed at para (b) in all the service areas, (c), (f) to (l) above.

1.15 Virtual Network Operators (VNOs) were permitted in India in 2016. VNOs are Service Delivery Operators (SDOs) treated as an extension of network service operators (NSOs), who do not own the underlying core network(s), i.e., VNOs are not allowed to install equipment interconnecting with the network of other NSOs. No spectrum is assigned to VNOs. Parenting with only one NSO is permitted for access services. VNOs can provide any or all telecom services, which are being provided by the existing telecom service providers. UL (VNO) is a regime parallel to UL. It offers all authorisations as available in the UL. In addition, it offers an authorisation for the 'Access Services Category B' wherein the service area is a District of a State/Union Territory.

1.16 As can be inferred from the above, considering the market and technological developments, the licensing regime has evolved with the passage of time.

D. Consultation process

- 1.17 Prior to issuing this comprehensive Consultation Paper, TRAI sought inputs from stakeholders on the broad framework for unbundling of license through a pre-consultation paper on "Enabling Unbundling of Different Layers Through Differential Licensing" dated 9th December 2019. Last date for submission of the written comments was 27th January 2020. Comments were received from 18 stakeholders. The details of the issues raised in the pre-consultation paper and comments received are discussed in Chapter 2. Based on the inputs received from the stakeholders, international practices and internal analysis, this consultation paper has been prepared seeking the inputs of the stakeholders on the specific issues raised in the consultation paper.
- 1.18 This consultation paper consists of five chapters. Chapter 1 provides the background information, Chapter-2 provides the details about the pre-consultation paper and the comments received from the stakeholders, Chapter 3, in brief, discusses the international practices about the telecom licensing followed in different countries, Chapter 4 provides the examination and raises the issues, and Chapter 5 provides the issues for consultation.

CHAPTER 2

PRE-CONSULTATION PROCESS

- 2.1 The NDCP 2018 under the mission 'Propel India', inter alia, mentions that 'the recent past has witnessed an unprecedented transformation in the Digital Communications Infrastructure and Services sector with the emergence of new technologies, services, business models, and players. There is, hence, an imperative need to review the existing licensing, regulatory, and resource allocation frameworks to incentivize investments and innovation to optimize new technology deployments and harness their benefits.' It envisages 'Enabling unbundling of different layers (e.g., infrastructure, network, services, and applications layer) through differential licensing' as one of the strategies for catalyzing investments for Digital Communications sector. In view of the NDCP 2018, DoT requested TRAI to provide its recommendations on enabling unbundling of different layers through differential licensing.
- 2.2 As per the current licensing regime, under Unified License, infrastructure, network, and service layers are not segregated and are part of the Unified License. However, the Infrastructure layer is unbundled in the form of Infrastructure Provider Category-I (IP-I), though with a limited scope. If the scope of IP-I provider is enhanced and it includes active infrastructure elements also, it will rightly serve the purpose of an independent infrastructure layer. Subsequently, TRAI has given its recommendations on 13th March 2020 on 'Enhancement of Scope of Infrastructure Providers Category-I (IP-I), which are available at:
https://traai.gov.in/sites/default/files/Recommendations_13032020.pdf
- 2.3 Unified License further offers service-wise authorizations, for establishing service-specific network and to provide the authorized service(s). For instance, in the case of Access Service authorization, both creation of network and delivery of service are embedded in the

license. Along with the network operations, such UL licensees are also providing the services to the customers under the same authorization. There is no separation of network layer from the service layer. The licensees of UL establish the network, maintain it, provide the service to the subscribers, manage the tariff, billing, QoS, customer care, etc.

2.4 UL (VNO) attempts to segregate the Service Layer from Network Layer. For service layer, the current regime of UL (VNO) may aptly fit into unbundling plan. At present, the UL (VNO) license for service delivery is quite successful in some of the telecom services, such as the Internet and Long-Distance Services. However, for mobile services, the VNOs are not picking up as the existing network operators, that is, Unified Licensees are providing the services to the subscribers themselves on retail basis; and they could not find any commercial interest in providing the network services (bulk services) on a wholesale basis to VNO, who then can retail it to the subscribers. It is, however, noted that one of the PSU Service Provider has offered the network services for few VNOs.

2.5 In unbundling of the network layer and service layer, there is a concept of independent network service provider/operator, who will establish the network and sell the services on a wholesale basis to the service delivery operator for retailing purpose. As the current licensees of the UL have their own networks as well as are providing the services to the consumers, it may be difficult for them to split their functions into two layers, and act as the network service provider and service delivery operator separately. However, it is possible to enable a parallel regime where the license itself can be granted for establishing only a network, maintaining it, and selling the services on a wholesale basis to the service delivery operators for retailing purpose. In order to promote such a regime, some incentive could be built-in for such standalone network operators, who will provide only network layer services on a non-discriminatory basis.

- 2.6 The application layer consists of those application providers who are providing various application services to different verticals using telecom resources. With technologies such as Machine-to-Machine (M2M) communications, IoT, Cloud services, data centres, e-commerce, etc., different application providers are in the field, and they are using the telecom resources. TRAI has already given its recommendations on M2M, Cloud services, Other Service Providers (OSPs), etc., with very light-touch regulation for such entities.
- 2.7 With the increasing digitalization, telecommunication sector has become even more important. Telecommunication facilities serve as the backbone for almost all the sectors. Further, the next-generation mobile technology, i.e., 5G would support many more use cases not only in the telecom sector but also across the sectors. 5G supports techniques such as network slicing, which makes it capable of offering Network as a Service (NaaS). At the same time, 5G would require establishment of small cells for densification of the network, which would require a lot of capital investment. To serve the entire nation in a cost-effective manner, it is essential that telecom resource sharing happens at a greater level. Therefore, it is essential that the licensing and regulatory regime are reformed in a manner to provide in-built resource sharing (including network), and to enable all the sectors, including non-telecom sectors, to be benefitted by the technological advancements. There would be many applications catering to different non-telecom sectors; however, they will use telecom resources for provision of services. The application market is bound to be huge, and everything cannot be provided and managed by the TSPs, which will require innovation and field-specific knowledge.
- 2.8 Unbundling of different layers will offer opportunities for sharing of telecom resources, and thereby, optimum utilization of it, which will contribute in achieving the objectives defined in NDCP 2018. It will also generate additional source of revenue for the infrastructure owners/service providers. This will further help in catalyzing

investment and innovation, cost-cutting, and effective utilization of infrastructure.

2.9 With convergence in Information Communication Technologies and Broadcasting markets, various countries have been modifying their telecommunication regulations to support the development of convergent services, and the expansion of markets and competition, with the objective of promoting the provision of new and innovative services, reduction of prices and increase of efficiency in the provision of services, and increasing the variety of offerings for subscribers.

2.10 With this background, a pre-consultation paper was released on 9th December 2019 requesting the stakeholders to elicit the issues, which are required to be considered for the unbundling of different layers of telecom services, and the changes required in licensing conditions for facilitating such licensing regime. In response to the pre-consultation, the Authority (TRAI) received comments from 18 stakeholders that are available on TRAI's website: www.trai.gov.in. Questions raised in the pre-consultation paper and summary of the comments received from the stakeholders are given below.

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).

2.11 While some stakeholders were in favour of unbundling of different layers of the license, many of the stakeholders were not in favour of any change in the licensing regime.

2.12 Some of the stakeholders supported unbundled licensing regime and opined that different layers (Infrastructure, Network, Services, and Application) should be allowed to work independently under their respective licensing/registration, which will be conducive of innovation, development of industry-specific products, will enable faster roll-out of the new technologies such as 5G, and achieve digital India mission of

the Government. Other benefits of having unbundled licensing regime listed by these stakeholders were:

- a) It will further allow respective licensees to focus exclusively on developing and deploying new and innovative services.
- b) It can facilitate efficient utilization of the network infrastructure and spectrum.
- c) The existing regulatory regime is based on voice-based networks, and needs to be aligned to the modern-day data-predominant networks by splitting them into multiple layers for creating a conducive environment for enabling innovative digital services.
- d) It will enable different rules and compliance requirements, and the prioritization or incentivizing of specific layers based on specific policy decision can be extended. For example, new unbundling rules could reduce regulatory levies for specific layers, less complicated compliance structures for enabling enhanced competition, thereby, expanding consumer choice and making the prices competitive, and will allow better harnessing of emerging technologies like 5G and AI.

2.13 Many stakeholders submitted that the current licensing regime supports the layered approach (i.e., infra, service and applications) and is well balanced; therefore, there is no need for any change in the licensing regime. Other points mentioned by these stakeholders are:

- a) Unbundling of license amounts to moving away from the principles of unified licensing and convergence. Further, any change in the current licensing regime may lead to an increase in the burden for existing players, and may increase the complexities and compliance requirements.
- b) Unbundling of licenses has been proposed to (i) promote innovation, (ii) attract investments, and (iii) promote sharing; until now, there has been no dearth of investments by existing TSPs, and the country

has benefitted immensely; the existing ecosystem has also enabled innovative services, OTT applications, M2M applications, etc., over the telecom infrastructure. Further, most of the TSPs have now hived off their fiber infrastructure to separate IP-Is to promote sharing. The sector has also witnessed sharing of spectrum and active infrastructure amongst licensed TSPs. Therefore, there is no need for introduction of a new licensing framework.

- c) Rather than changing the entire regulatory regime yet again, the Authority may consider seeking the list of issues being faced by the various stakeholders and guide and support the stakeholders in addressing such crucial issues, so as to ensure that the objective behind the introduction of unified licensing regime is effectively achieved.
- d) If all application providers are required to have a license, then all innovation that involves telecom would cease. Perhaps, instead of creating a plethora of licenses through layering, a more effective system would be to have a single telecom license (or even registration) and letting the license/registration holders decide what aspects of the telecom industry they want to address.
- e) IP-Is are already covered under registration, hence, it should not be brought under the licensing regime.

2.14 In Question 1 of the pre-consultation paper, the stakeholders were also requested to suggest the measures that can be taken to overcome the anticipated problems (if any). In response, one of the stakeholders mentioned that since Digital services generate a lot of data, the data security, protection, and privacy regulations have a direct bearing on their provisioning. Newer technologies, i.e., 4G or 5G, cloud computing, etc., empower controlling abilities from the services plane. Imposing restrictions/controls only in the telco domain, for securing/controlling digital services, potentially either stifles innovation or results in cost escalation for the service leading to adoption issues. Another

stakeholder mentioned that to discourage incumbent operators' resistance for unbundling, monetary compensation, mandatory network sharing, penalization for non-compliance, surge charges for non-sharing are suggested. It was also proposed that all operators should declare their utilized and available resources to the licensor on an annual basis in order to ensure constructive sharing. Commercial terms for sharing of the in-building telecom infrastructure system may be decided by the provider TSP in a transparent, fair, and non-discriminatory manner.

2.15 In reference to the anticipated problems, w.r.t., identification of subscribers, traceability, and accountability, mandating the same KYC norms for every subscriber and audit trails for any law enforcement for every application service provided by the Application Services' Providers has been suggested by one of the stakeholders.

2.16 One stakeholder mentioned that for closer inter-departmental coordination for the digital services policy formulation, DoT is required, and TRAI should be compulsorily kept in loop during the deliberations for any digital service being envisaged by the different ministries/government agencies.

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?

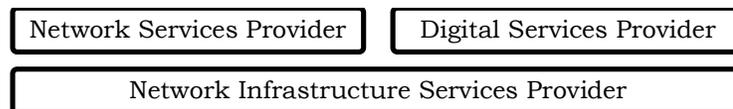
(b) Should there be a new regime of licensing on which the existing licensees should migrate within a specified time frame or there should be a parallel incentivized licensing regime for unbundled layers of license?

2.17 Most of the stakeholders reiterated that the current licensing regime is well balanced, and provides space for required segregation of layers,

while ensuring the optimum utilization of telecom resources, and there should not be any change in the current licensing regime as it may lead to increase in the burden for existing players. Some of the stakeholders in favour of unbundling of different layers of license suggested different models and gave suggestions for migration or parallel licensing regime. The models as suggested by the stakeholders are as follows:

a) Model No. 1

2.18 In this model, it has been suggested that licensing regime should be split into three layers viz. Network Infrastructure Services Provider (NISP) layer, Network Services Provider (NSP) layer, Digital Services Provider (DSP) layer. Voice, messaging, and data services will be the product of the NISP layer, and can be sold on a non-discriminatory basis only to registered NSPs and DSPs. The NSPs and DSPs would sell these services to their customers.



(i) NISP layer will comprise of physical infrastructure, active passive elements, and cloud-based instances of network elements required to deploy a telecom network. Voice, messaging, and data services will be the product of the NISP layer, and can be sold on a non-discriminatory basis only to registered NSPs and DSPs.

(ii) NSP will sell only the basic services, viz., voice, messaging, and data connectivity to retail and corporate customers for their own end usage only.

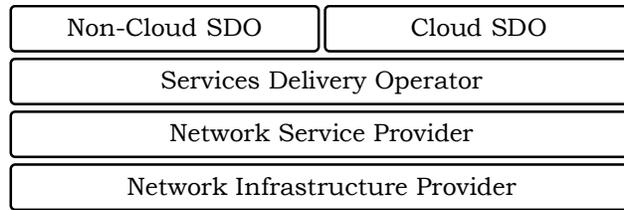
(iii) DSP will do the substantial value add to the basic network services of NSIP before selling it as a bundled service to their customers.

2.19 In this model, the stakeholder has proposed that the service utilization measurement metric will be product (voice, messaging, and data) of the NISP layer, and services tariff definition will be by the NSPs and DSPs as an independent activity. In order to avoid anti-competitive practices of the NISPs, their services will be declared as 'Bottleneck Services', and, hence, mandating time-bound provisioning and configuring of services that are requisitioned by the NSPs and DSPs. Light-touch regulations for the entire multi-layered services ecosystem is proposed, which will facilitate investment into network infrastructure by multiple service providers, and will enhance competition for retail services. This will maximize the infrastructure capacity utilization; provisioning of services without any discrimination; create homogeneous environment conducive for innovation; create environment for better and focused security control through mandated implementation of security by design principle; faster, better evolution and adoption of innovative technology services; and, thereby, faster and better implementation of the Government's Smart City and other Digital programs. Further, this will help in simplifying accounting, taxation, and auditing processes, and will prevent chances of under reporting.

2.20 For this model, suggested changes include complete separation of telecom infrastructure from the telecom services. Only NISP layer would be under a license from DoT on which an administrative fee (1% of revenue) will be levied instead of license fee or spectrum usage charge; NSP and DSP will be registered with DoT, and only GST will be levied on the services provided by them. Further, existing licensees should migrate within a specified time frame.

b) Model No. 2

2.21 This suggested model will comprise of Network Infrastructure Provider (NIP), Network Service Provider (NSP), Service Delivery Operators (SDOs).



(i) NIP will be responsible for providing base network components to NSP, to create a reliable network.

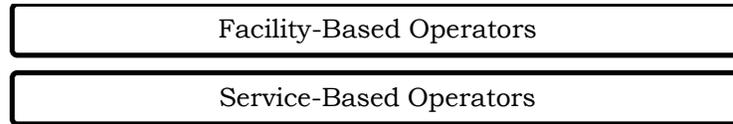
(ii) NSP will create a strong network using components provided by NIP, and it will be entitled for spectrum from the Government. All network-related issues will be the core responsibility of NSP. It can service the end consumer directly and can also tie up with the SDO to provide industry-specific customizations and take advantage of new innovations.

(iii) SDO will take telecom resources from NSP and wrap the resources in an industry-specific customization. Further, SDOs can be segregated into Cloud SDO and Non-cloud SDO. Non-cloud SDO may be restricted to a particular geographical location. Cloud SDO will deliver the services to end consumer only over cloud, and there will not be a need to lay down any physical infrastructure, and can also deliver services to all India from a single Location.

2.22 For this model, suggested changes include that VNO license should be converted to SDO license, and be made simpler. SDOs should be able to provide all telecom resources, viz., mobile numbers (VMN: Virtual Mobile Numbers), Toll Free Numbers, landline numbers, voice calls, etc., to all over India in a single license. These possibilities are not covered in the existing VNO license. Further, there should be a Cloud-VNO license to allow the use cases of Cloud SDO. A provision of SDO between the NSP and End-Business customer can develop innovative solution to the customers on need basis from NSP, and it will help in Enabling one-time use cases.

c) Model No. 3

2.23 This model is on the lines of Singapore which has two layers: Facility-Based Operators (FBOs) and Services-Based Operators (SBOs).

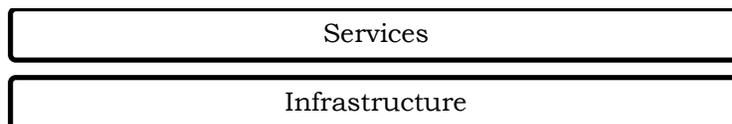


(i) FBO refers to entire underlying network infrastructure built for rendering all telecom services/application service, all the existing UL licensees can migrate to this framework without the need for any new parallel incentivization.

(ii) SBO will comprise all OSP/UL-VNO/Audiotext/etc., kind of services which may be migrated to a single services-based operations regulatory framework with light-touch regulation without compromising on any security/KYC/Audit-trail requirements.

d) Model #4

2.24 In this suggested model, there will be two layers: Infrastructure layer and Service Layer. For the Infrastructure layer, restriction on sharing of active infrastructure will be revised, and for Service layer, any new change in regulatory set-up should include light-touch framework for promoting competition. Further, it is proposed that the new licensing regime should extend its scope to issues that are not solvable by market forces, and are skewed against the consumer.



2.25 In reference to the migration of existing licensees to new regime, one stakeholder proposed that the existing licensees should migrate within the specified time frame, and others who want to apply for the license can directly apply under the new license regime, as parallel incentivized

licensing regime will make it even more complicated to implement. Some stakeholders suggested that the migration should be either on the expiry of existing licenses or through incentivization for speeding up the migration to a new regime but there cannot be any forced migration; further, a level-playing field shall be maintained for all stakeholders.

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 the utilization of the existing resources, and (ii) catalyse investments and innovation in Digital Communications sector?

2.26 Some stakeholders have proposed to provide appropriate policy and financial stimulus to the existing TSPs such as allowing pass-through for the purpose of AGR, LF, and SUC, to facilitate the active infrastructure sharing when payment is made by one TSP to another TSP; Infrastructure sharing should be further liberalized to allow sharing of core infrastructure such as MSC, HLR, IN, etc., among licensees of UASL/UL (Access/ NLD/ ILD/ISP/VSAT Authorization) to reduce cost and facilitate a faster roll-out; and significant downward revision or removal of additional SUC in case of spectrum sharing. Infrastructure sharing should be freely allowed in ISP license.

2.27 One stakeholder suggested that UL VNO(AS) licensee be allowed to be parented with two or more NSOs (Access Providers).

2.28 Few stakeholders suggested that the scope of IP-I be enhanced to own, deploy, and maintain an end-to-end common sharable infrastructure irrespective of active or passive, to increase utilization.

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

- 2.29 In response to Question 4, some stakeholders suggested that the changes in the existing license regime should aim towards simplification in terms of levies required to be paid by the operators, compliance processes, and costs in the licenses, and identifying Telecom infrastructure as a critical infrastructure. Rationalization of levies and charges payable and review of definition of AGR to include revenue only from licensed services was also suggested.
- 2.30 Some stakeholders proposed that light-touch regulation for application providers such as M2M, IoT, Cloud services, data centers, e-commerce, etc., may be continued, and they can continue to take telecom resources from the licensed TSPs.

CHAPTER 3

INTERNATIONAL PRACTICES

I. Australia

- 3.1 Australian Communications and Media Authority (ACMA) regulates the communications and media services in Australia, and distinguishes between the carriers and carriage service providers. Telecommunication or carriage services can be provided by carriers or carriage service providers.
- 3.2 *Carriers:* Carriers or carrier providers are the owners of Telecommunications 'Network Unit' to supply the carriage services. Telecommunications' companies need carrier licenses or nominated carrier declarations (NCD) to operate facilities (transmission infrastructure cabling, wireless networks, satellite facilities), to supply telecommunications services to the public, such facilities are called "network units". Through NCD, infrastructure owner nominates a carrier to operate its facilities, and, thereby, a license holder accepts responsibility for the network units as an owner for their operation. The licensed carrier applies for the NCD to the ACMA, and the owner of the network unit does not require a carrier license. There are no restrictions on the number of carriers' licenses issued by the ACMA. A carrier can also be a carriage service provider as it does not require a license, and there is no prohibition.
- 3.3 Carrier that operates radiocommunications' equipment for the purpose of supplying carriage needs to have spectrum license. Usually, spectrum licenses are auctioned and are valid up to 15 years. Spectrum license can also be traded (or in parts of it) with others.
- 3.4 Carriers are obliged to provide access to their telecommunications' infrastructure if other carriers request this on reasonable terms. They must comply with the standard access obligations under the Competition and Consumer Act 2010. Under this Act, the ACCC (Australian Competition and Consumer Commission) facilitates access to the networks of carriers and carriage service providers. This includes

declaring services for access, approving access codes and access undertakings, arbitrating disputes about declared services, and registering access agreements.

3.5 The standard carrier license conditions set out an obligation regarding access to facilities, and network information of other carriers. The carrier must provide other carriers with access to their facilities for enabling them to provide facilities and carriage services or establish their own facilities. There is an additional facilities' access condition, which requires carriers to provide other carriers with access to the telecommunications' transmission towers, sites, and underground facilities, if technically feasible.

3.6 The number of Licensed Carriers (April 2020) and Nominated Carrier declaration (March 2020)¹ are:

Licensed Carriers	Number
Total carrier licences granted	535
Active	305
Surrendered	203
Cancelled	27

Nominated Carrier declaration	Number
Total NCDs granted	167
Active	89
Revoked	78

3.7 *Service Providers:* There are two types of service providers: Carriage Service Providers and Content Service Providers. Carriers provide the basic transmission infrastructure on which carriage and content services are supplied to the public.

- A *carriage service provider* uses carriers' facilities, and does not have its own network units to supply telecommunications' services to the public such as phones and the Internet. Carriage Service Providers include organisations that resell time on a carrier network for phone calls, provides access to the internet

¹ <https://www.acma.gov.au/register-carrier-licences-and-nominated-carrier-declarations>

(ISPs), provides phone services over the internet (VoIP service providers).

- A *content service provider* supplies content services to the public (for example, a pay TV service).

3.8 Service providers don't need individual licences, but they must comply with the Telecommunications Act 1997 including an obligation to join the Telecommunications Industry Ombudsman² (TIO) scheme, access obligations, and other types of service provider rules imposed by ACMA.

3.9 Carriers and carriage service providers must comply with any ACMA pre-selection determinations. The Determinations require telecommunication networks and facilities operated by a carrier or carriage service provider to permit an end user to: (1) pre-select another carriage service provider as the end user's preferred carriage service provider for specified national and international calls, operator assisted services, and calls to mobile telephones, and (2) change the selection from time to time through a written request. Such networks and facilities must also provide override dial codes for selecting alternative carriage service providers for pre-selectable calls on a call-by-call basis.

3.10 *Radio Communication Licenses:* It is needed to use the radiocommunications' equipment, and there are three categories of radiocommunications licenses – Apparatus, Class, and Spectrum.

- *Apparatus Licenses:* It is needed to operate certain types of transmitters and receivers and are usually given for one year, which can be renewed. There are 16 transmitter licenses, which may be an assigned license (frequency is allocated) or a non-assigned license (frequency shared with other users) and five receiver licenses, which are assigned licenses.
- *Class License:* There are 15 Class Licenses for the use of common radio equipment on shared frequencies. There is no need to apply for a class license, and there are no license fees.

² <https://www.tio.com.au/about-us>

- *Spectrum Licenses*: It allows the use of range of radio devices in a specific geographical area and frequency band. These are valid for up to 15 years and are usually auctioned, however, they can be traded (or in parts of it) with others.

3.11 *Area-wide Apparatus License*: The ACMA has proposed a new transmitter and receiver license type, referred to as the area-wide apparatus license (AWL) type. The AWL type is intended to authorise the operation of one or more radiocommunications' devices within a defined geographic area at a specified frequency(ies). This license type will be scalable, enabling its use for different-sized geographic areas and bandwidths, and will be capable of authorising a variety of fixed and mobile services, uses, applications, and technologies.

II. **South Africa**

3.12 In South Africa, licensing framework³ for telecommunications is contained in the Electronic Communications Act, 2005. The main service licenses can be categorised as:

- (a) Electronic Communication Services
- (b) Broadcast Services
- (c) Postal Services

For Electronic Communication Services, ICASA grants individual licenses for electronic communications network services (ECNS), and electronic communications services (ECS).

3.13 *Electronic Communication Network Service (ECNS)*: This service makes available an Electronic Communications Network (ECN), either by sale, lease or otherwise. ECN is the system of electronic communications facilities (in line with the technologically neutral licensing framework), and may include satellite systems, fixed and mobile systems, fibre-optic cables, and electricity cable systems. There are two categories of ECNS licenses, namely, Class ECNS license and Individual ECNS license.

³ <https://www.icasa.org.za/pages/services-licencing>

- *Individual ECNS (I-ECNS)* licensees operate for commercial purposes on a provincial and/or national scope, and is issued for 20 years.
- *Class ECNS (CECNS)* licenses are limited to a local or district municipal scope geographical area (for example, the City), and is issued for 10 years.

There are presently 418 Individual ECNS licenses and 1,065 Class ECNS licenses in South Africa. However, not all licensees are operational.

3.14 Electronic Communications Services (ECS): Any service provided to the public, the state, or the subscribers by any means of electronic communications over an ECN, but excludes broadcasting services. ECS licensee may provide services to customers over its own or a third-party's network. There are two categories of ECS licenses, namely, Class ECS license and Individual ECS license.

- *Individual ECS (I-ECS)* licensees provide all forms of electronic communications on a provincial and/or national scope. It is issued for 20 years and can be applied in response to Invitation to Apply (ITA). They provide ECS that consists of voice telephony utilising numbers from the national numbering plan and operated on a national level.
- *Class ECS licenses (C-ECS)* allows holder to provide the same services as those authorised in terms of an individual ECS license, including voice services within a particular geographical area (for example, the City). Such licensee does not have the right to apply for numbers from the Authority's national numbering plan. For C-ECS licenses, the registration notice can be lodged with the Authority at any time. It is issued for 10 years.

There are presently 466 Individual ECS licenses and 939 Class ECS licenses. However, all are not operational.

3.15 Licensee can make use of its own ECN if it holds the requisite ECN license or it can enter into agreements with the third-party ECNS licensees to carry the services to the customer.

3.16 *ECS Vs ECNS types:*

Criteria	Electronic Communications Network Services (ECNS)	Electronic Communications Services (ECS)
Wholesale vs. retail	An ECNS licensee wholesales network capacity to ECS licensees or other ECNS licensees for resale, but it does not deal with the public.	An ECS licensee offers retail services to the public (and may also provide wholesale services for resale to third parties).
Physical vs. virtual networks	An ECNS licensee operates physical networks made of facilities such as fibre or base stations.	An ECS licensee operates virtual networks such as VPNs and MPLS networks.

3.17 The Electronic Communications Act 2005⁴ as amended in 2014⁵ makes it an obligation for any licensed entity on request to interconnect and to lease electronic communications facilities with any other person licensed in terms of the ECA unless the request is unreasonable. ECNS licensees can enter into commercial arrangements with other licensees to allow them to use the electronic communications network owned and operated by the ECNS licensee. The Electronic Communications Facilities Leasing Regulations, 2010, prescribes the processes for requesting, negotiating, and enforcing facilities leasing agreements. The lease of electronic communications facilities by an ECNS licensee should be transparent and non-discriminatory, as among comparable types of electronic communications facilities being leased and not be of a lower technical standard and quality than the technical standard and quality provided by such ECNS licensee to itself or to an affiliate or in any other way discriminatory compared to the comparable network services provided by such licensees to itself or an affiliate. Facilities

⁴ <https://www.icasa.org.za/uploads/files/Electronic-Communications-Act-2005.pdf>

⁵ <https://www.icasa.org.za/uploads/files/ECA2014.pdf>

leasing agreements only become enforceable when approved by ICASA, and facilities leasing agreements are made publicly available. The requests for leasing of essential facilities are deemed to promote efficient use of electronic communication networks and services.

- 3.18 The Electronic Communications Facilities Leasing Regulations, 2010, require the request to be in writing along with required technical specifications. It provides for a fixed period of 45 to 60 days for parties to negotiate and agree on the terms of leasing the ECN facilities. However, ICASA (Independent Communications Authority of South Africa) does not regulate the cost of access to facilities. ECNS licensees are required to lease facilities or infrastructure where it is technically and economically feasible on a non-discriminatory basis. However, the ECNS licensees are not obliged to sell wholesale capacity to other licensees, but selling of wholesale capacity in the form of national roaming, wholesale APN (including Mobile Virtual Network Operators), etc., is prevalent. In other words, ECNS licensees can enter into commercial arrangements with other licensees to allow them to use the electronic communications network owned and operated by the ECNS licensee.
- 3.19 All facilities leasing agreements must be filed with ICASA and are considered effective and enforceable on filing. ICASA is empowered to adjudicate facilities leasing agreement disputes that are referred to it in terms of the Facilities Leasing Regulations.

III. Uganda

- 3.20 Uganda Communications Commission (UCC) recently came out with the new licensing regime in January 2020. The Objective of the New Framework includes easy market entry, and increase competition, effective utilization of resources, increased broadband roll-out, and enhance local ownership. The new framework comprises of National Telecom Operators (NTOs), Public Infrastructure Providers (PIPs), and Public Service Providers (PSPs).

3.21 *National Telecom Operator (NTO)*: The NTO license allows to establish and provide both telecommunication infrastructure and services across the entire country for 20 years. However, it must at minimum cover and provide service in 95% of the geographical area of Uganda. NTOs are eligible for national spectrum allocation based on technical expansion/development plan, legal and regulatory framework, public interest and availability of the respective resources. For NTOs, it is:

- Obligatory to host and/or provide infrastructure services to PSP for regional and national roll-out of services within their respective licensed zone.
- Obligatory to host and/or lease to or from National Operator and/or PIP for network roll-out and provision of infrastructure within licensed zones.
- Obligatory to share active and passive infrastructure, including National roaming.

3.22 *Public Infrastructure Providers (PIPs)*: PIPs are licensed to roll out and provide infrastructure nationally (NPIP) or regionally (RPIP) for 15 years. These will be eligible for spectrum allocation subject to availability in licensed regions based on the expansion plan, legal and regulatory framework, public interest, and availability of respective resources. They shall lease to and from NTOs and PIPs for roll out of infrastructure in licensed zones. However, licensee is not allowed to provide services to final consumers, except where the operator also holds a PSP license. It is obligatory to host and/or provide infrastructure services to PSP for roll out of services. It is also obligatory to share active and passive infrastructure including national roaming.

3.23 *Public Service Providers (PSPs)*: PSPs are licensed to operate telecommunication services, provide all communication VAS, and capacity resale services nationally (NPSP) or regionally (RPSP) for five years. They need to obtain infrastructure services from NTOs and PIPs in licensed areas, and licensee shall not be allowed to install or otherwise provide infrastructure services. Licensee shall not be eligible for spectrum assignment.

- 3.24 When an Operator requires two National operator licenses, i.e., NPSP and NPIP, such operator shall obtain NTO. Spectrum shall be assigned only to NTO, NPIP, and RPIP license holders and other licensees shall be required to roam on NTO, NPIP, and RPIP infrastructures.
- 3.25 For migration to new licensing regime, all existing operators have to indicate the category of license(s) for which they wish to be considered. However, they are allowed to continue operating in accordance with the terms and conditions of their existing licenses for six months. As on 01st April 2020⁶, there are 33 licensees. Among them, there are 2 NTOs, 4 PIPs, 15 PIP & PSPs, 12 PSPs (6 PSP – Capacity Resale, and 6 PSP – Voice and Data).
- 3.26 As per the license agreement, the Licensee shall grant access to its systems and facilities to Licensed operators and authorised service providers under the agreed technical and commercial terms and conditions. All written access agreements are to be approved by the Licensor. Access shall include the provision by the Licensee of any systems, services, or arrangements through which another operator or authorised service provider is able to directly or indirectly make use of (i) any network resource(s) or service(s) provided; or (ii) any facilities comprised in the provision of services. The Licensee may decline to offer access services only where the Licensee demonstrates to the Licensor that its existing network resources or facilities are inadequate for the provision of services sought to be provided by the access seeker through the Licensee’s network or system. The access Agreement is to be executed within 30 (thirty) days of the receipt of a request from the access seeker and Licensee to ensure access to its network within 30 (thirty) days after the execution of the access agreement. In case of failure in reaching mutual Agreement within the specified period, the Licensor may receive and investigate any complaint(s) and make a decision thereon in accordance with the Act and Regulations.
- 3.27 In case of wholesale services, it is restricted to telecommunication service providers and the Licensee will ensure wholesale of

⁶ <https://www.ucc.co.ug/list-of-telecom-providers/>

telecommunication services is undertaken fairly, reasonably and in a non-discriminatory manner for which the licensee will make a decision and complete negotiations within 45 (forty-five) days from the date of receipt of a request from an applicant. The Licensee may decline to offer wholesale services only in cases where the Licensee demonstrates that the existing network resources or facilities are inadequate for the provision of telecommunication service by the Licensee. Where the Licensor and applicant for wholesale services fail to reach a mutual Agreement within the specified period, the Licensor may receive and investigate any complaint referred to the Licensor arising out of the said matter and make a decision thereon.

3.28 The terms and conditions on the access services Agreement and wholesale services Agreement will include rights, duties, and responsibilities of the contracting parties which are clear and reasonable; technical details regarding the telecommunication network or services to be used in the operations; standards and quality of access or wholesale services; utilization, maintenance or measures on information protection for a fair provision and receipt of access services; provisions which do not directly or indirectly force either contracting party to unfairly restrict their services or to limit their discretion to obtain, give or receive services from any other parties; provisions which do not monopolize, reduce or restrict competition in the business operations of either the contracting party or a third party. The copy of the Agreement is to be submitted by the Licensee to the Licensor within ten days from the date of execution of the access agreement.

3.29 The access and wholesale service rates will be charged on a cost-oriented basis, with transparency, fairness, and will be non-discriminatory to all telecommunication service Licensees. The Licensee will provide to the Licensor a copy of its charges for all Licensed services for approval within 14 days after execution of this License Agreement which will include calculation, information, and documentation as are necessary to support the pricing. The Licensee will thereafter notify and obtain approval from the Licensor whenever it proposes any changes in the existing tariffs or introduces any new tariff plan.

IV. Singapore

- 3.30 In Singapore, licensing approach differentiates licensees based on the nature of their operations, that is, Facilities-Based Operators (FBO) or Services-Based Operators (SBOs).
- 3.31 *Facilities-Based Operators (FBO)*⁷: FBOs can deploy any form of telecommunication network, systems, and facilities to offer telecommunication switching and/or telecommunication services to other licensed telecommunication operators, business, and/or consumers, that is, FBOs are also licensed to provide services. License is granted for 15 years and allowed to offer services that SBO can offer. Entity require only a single license for all the networks/services it intends to operate/offer. The Authority (IMDA) does not pre-determine the number of FBO licenses to be issued but spectrum or other resource constraints may limit the number of licenses available for certain networks and/or services. Currently, there are more than 70 FBOs licensees.
- 3.32 *Service-Based Operators (SBO)*⁸: SBOs lease telecommunication network elements from FBO to provide telecommunication services, or to resell telecommunication services of FBOs to third parties. Entities providing SBO operations and services, depending on the scope of the operations and nature of the services, are individually or classed licensed by the Authority. SBO (Individual) license is required for the stipulated types of operations and services; and SBO (Class) license category is only required to register before providing the stipulated types of services. Operators who lease international transmission capacity for the provision of their services will be licensed individually. Currently, there are 250 SBO (Individual) licensees and 900 SBO (Class) licensees.
- 3.33 In order to ensure that SBOs do not face any difficulty in getting access facilities from FBOs, the Licensee comply with the Authority's framework for facilities sharing and deployment, including all relevant codes of practice, directions and notifications which the Authority may

⁷ <https://www.imda.gov.sg/regulations-and-licensing-listing/facilities-based-operations--fbo--licence>

⁸ <https://www.imda.gov.sg/regulations-and-licensing-listing/services-based-operations--sbo--licence>

issue from time to time. Under the Telecoms Competition Code⁹, the IMDA requires Dominant Licensees (usually FBO licensees) to provide interconnection and access-related services to facilities-based and service-based licensees, under their Reference Interconnection Offers.

3.34 The 'Framework for the Wholesale of Mobile Services (Wholesale Framework)'¹⁰ which came into effect from 14th January 2020, inter alia provides that:

- Host Mobile Network Operators (“MNOs”) and the Requesting Parties (“RPs”) should negotiate in good faith, and use best efforts to complete negotiations within a reasonable period.
- Host MNOs should offer (i) SMS; (ii) voice; and (iii) data wholesale services, in any combination on an end-to-end basis, as requested by the RPs.
- Host MNOs should not impose unreasonable restrictions on: (a) The use of the wholesale inputs by the RPs; (b) The RPs’ retail service offerings; and (c) The RPs’ retail prices.
- Host MNOs and the RPs should agree on a pre-defined set of parameters on Service-Level Agreement and quality of service for the wholesale services, to ensure that there is no discrimination in terms of service quality between the end users of RPs and Host MNOs, unless agreed otherwise.

3.35 In general, a telecommunications licensee is not required to share with its competitors the use of infrastructure that it controls. Instead, each licensee is expected to build or lease the use of the infrastructure that it requires. FBO licensees are only required to share "Critical Support Infrastructure" as defined in the Telecoms Competition Code, which is determined at IMDA's discretion. IMDA can also require an FBO licensee to share the use of infrastructure with other FBO licensees, if it concludes that such sharing is in the public interest. Certain infrastructure must also be shared to include Radio distribution

⁹ <https://www.imda.gov.sg/-/media/Imda/Files/Regulation-Licensing-and-Consultations/Frameworks-and-Policies/Competition-Management/Telecom-Competition-Code/02-2012TCCwef2July2014.pdf>

¹⁰ <https://www.imda.gov.sg/-/media/Imda/Files/Regulations-and-Licensing/Licensing/Telecommunication/Services-Based-Operations-Licence/Wholesale-Framework.pdf?la=en>

systems for mobile coverage in train or road tunnels; In-building cabling; Lead-in ducts and associated manholes; Monopoles; Radio towers.

V. **United Kingdom**

3.36 In UK, a general authorization regime prevails, which makes no distinction between fixed, mobile and satellite networks and services. Broadly, there are two types of communication providers:

- Electronic Communication Networks (ECN) Providers
- Electronic Communication Services (ECS) Providers

3.37 No license is required to install or operate electronic communications networks or services unless the use of radio frequency spectrum is involved. Anyone using radio spectrum (such as MNOs and satellite service providers) needs a license under the Wireless Telegraphy Act (WTA) 2006, unless the government has exempted the particular use from the need for a license. A MVNO does not require a WTA license as it is a customer of an MNO and is not itself a user of radio spectrum.

3.38 All U.K. communications networks and service providers (including MVNOs) do need to comply with a general authorization regime (under the Communications Act 2003) for the provision of communications services. Radio frequency spectrum license is generally assigned through auction mechanism for a period of 20 years.

3.39 There isn't any specific regulation for MNOs to provide access facilities to MVNOs. In general, Ofcom regard the wholesale market for mobile connections to be competitive, so there isn't any competition regulation. It is up to each MNO to decide whether, and on what terms, it supplies MVNOs. The Competition & Markets Authority (CMA) is responsible to look that MVNOs do not face any difficulty in getting access facilities in reasonable and transparent terms, but for now there are no obligations in the U.K.

VI. United States of America

- 3.40 In USA entities are authorized to provide domestic telecommunications services, which is automatically granted upon registration with the FCC (and USAC), and there is no requirement to renew.
- 3.41 For utilizing the radio spectrum to provide domestic telecom service, entities must obtain a radio license for the frequencies to be used before commencing the service. Providers of licensed wireless, broadcast or satellite services are required to operate consistent with the terms of their FCC license and applicable FCC rules including that of interference. Licensees providing commercial mobile radio services are classified as telecommunications carriers. Telecommunications carriers must obtain an FCC Registration Number (FRN). Radio licenses are term-limited, and must be renewed to permit continued operation beyond the license term. FCC radio licenses and authorizations generally may not be transferred or assigned except with the prior approval of the FCC. Some state laws also require approval by the state prior to the transfer of control or assignment of state telecommunications authorizations.
- 3.42 There is no mandate for MNOs to provide access facilities to MVNOs, and FCC rules do not require facilities-based providers to offer wholesale services to other service providers for resale. MVNOs are not licensees. However, a diverse range of MVNOs purchase wholesale capacity from facilities-based providers for use as inputs to their own retail wireless services – as resellers of service offered by facilities-based service providers. Facilities-based providers' wholesale services are offered through unregulated, negotiated commercial contracts, which take a variety of forms, both in terms of price levels and the structure of the arrangements. Different types of resellers often increase the range of services offered to consumers by means including, but not limited to, targeting certain market segments, including segments not previously served by the hosting facilities-based provider (e.g., low-income consumers, or consumers with lower data-usage needs).

3.43 Entities seeking to provide telecommunications services between the U.S. and any foreign point must apply for, and obtain an international authorization before commencing service and there is no requirement to renew.

VII. Malaysia

3.44 The Malaysian licensing framework separates the network from service, and places emphasis on the activity rather than on the technology. The licensing regime allows a licensee to undertake activities that are market specific. This creates opportunities for expansion into the industry particularly in the area of Applications Service Providers and provides for a more effective utilization of Network Infrastructure. There are four categories of licensable activities namely, Network Facilities Providers, Network Services Providers, Applications Service Providers, and Content Applications Service Providers.

3.45 *Network Facilities Providers (NFP)*: They are the owners of facilities such as satellite earth stations, broadband fiber optic cables, telecommunications lines and exchanges, radio-communications transmission equipment, mobile communications base stations, and broadcasting transmission towers and equipment.

3.46 *Network Services Providers (NSP)*: They provide the basic connectivity and bandwidth to support a variety of applications. Network service enables connectivity or transport between different networks, and are typically also the owner of the network facilities.

3.47 *Applications Service Providers (ASP)*: They provide particular functions such as voice services, data services, content-based services, electronic commerce and other transmission services. Applications services are essentially the functions or capabilities, which are delivered to end users.

3.48 *Content Applications Service Providers (CASP)*: They are special subset of applications service providers including traditional broadcast

services, and the latest services such as online publishing and information services.

3.49 A licensee can hold all four licenses, depending on the type of licensable activity it wants to provide. Generally, a licensee must hold the NFP license before it is allowed to apply for spectrum. Also, acquiring spectrum requires the entity to manage connectivity. Therefore, in practice the entity holding the spectrum will hold both NFP and NSP licenses.

3.50 Within these four categories, two types of licenses exist namely, Individual licenses (granted for activities with a high degree of regulation, e.g., the need to grant rights of use for spectrum) and Registration. The licensees (2018) in each category are as follows:

Type of License	Individual	Class
Network Facilities Provider (NFP)	220	10
Network Service Provider (NSP)	183	10
Applications Service Provider (ASP)	Only class license	413
Content Applications Service Provider (CASP)	56	11

3.51 The Communications and Multimedia Act 1998 (CMA)¹¹ establishes an standard access obligations for facilities and services, wherein an NFP and NSP shall provide access to their network facilities or network services listed in the access list to any other NFP, NSP, ASP, or CSP, who makes a written request for access to such network facilities provider or network service provider on reasonable terms and conditions. However, the provider may refuse the request giving a valid ground for refusal, which, inter alia, includes technically infeasible, insufficient capacity. The Commission has discretion to include network facilities, network services, or other facilities or services facilitating network services or applications services in the access list, and are: (a) network facilities; (b) network services; and (c) other

¹¹

https://www.unodc.org/res/cld/document/mys/communications_and_multimedia_act_html/Malaysia_Communications_and_Multimedia_Act_1998.pdf

facilities and/or services which facilitate the provision of network services or applications services, including content applications services. The facilities or services listed in (c) do not have to be owned or provided by the licensees. The commission maintains register of such facilities included in the Access List.

- 3.52 The access provided by one provider to another provider shall be of at least the same or more favourable technical standard and quality as the technical standard and quality provided on the first provider's network facilities or network services; and on an equitable and a non-discriminatory basis. On contravention, the person is liable for fine (up to exceeding five hundred thousand ringgit) or imprisonment (up to five years) or both.
- 3.53 The Commission Determination on the Mandatory Standard on Access only applies to the wholesale relationship between operators in relation to access to facilities and services included in the Access List. However, the Commission encourages operators to treat the Mandatory Standard on Access, where relevant, as a guideline for other wholesale access arrangements.

VIII. **Tanzania**

- 3.54 Similar to Malaysia, Tanzania also have Converged Licensing Framework (CFL) and includes the same four categories of licenses as those established in Malaysia, namely, Network Facility Licence (NFL), Network Service Licence (NSL), Application Service Licence (ASL), and Content Service Licence (CSL).
- 3.55 Operators are allowed to hold licenses for all categories but, this will depend upon whether a particular operator needs to provide services in any area among the four licenses categories and accordingly require an appropriate license. In case of NSL, it needs also to have an NFL in order to lease out excess capacity. As on 30th April 2020, there are 21 Network Facility Licensees, 12 Network Service Licensees, 87 Application Service Licensees and 228 Content Services Licensees. However, only Network Services Licensees are allowed to acquire access spectrum.

- 3.56 As per Electronic and Postal Communications (Access, Colocation and Infra-structure sharing), Regulations, 2018¹², any licensee who owns, leases or manages infrastructure is obliged to negotiate and enter into a sharing agreement, upon request for sharing of tangible or intangible communications facilities. An infrastructure provider shall be obliged to share communication facilities (active and passive) with infrastructure seekers on first-come first-served basis and, on the principles of impartiality and non-discrimination. However, the licensees shall meet the roll-out obligations contained in individual licenses irrespective of infrastructure sharing agreements.
- 3.57 This regulation, inter alia, mentions that licensees shall, except the infrastructure which allows Radio Frequency Spectrum Sharing, share passive (site / colocation and Transmission) and active (core nodes, radio access nodes, antenna and transmission equipment) infrastructure, without compromising quality of service or competition. All licensees shall, when sharing infrastructure, ensure that standard equipment and technical interfaces are used and the quality of service provided to an Infrastructure Seeker does not differ from the quality of service within the Infrastructure Provider's own infrastructure network. However, there is a provision for licensees according to which they shall have the right to reserve capacity for future use based on future network roll-out plans, which shall be approved by the Authority.
- 3.58 A request for infrastructure sharing shall be in writing and will include the type of infrastructure required for sharing or co-location; technical and physical requirements of infrastructure to be shared. An infrastructure provider shall treat each infrastructure seeker on a basis that is non-discriminatory in its provision of network facilities and no less favourable than the treatment which the infrastructure provider affords to its subsidiaries, its affiliates, or other similarly situated communications service providers. An infrastructure provider may refuse unreasonable requests for co-location or infrastructure sharing

¹² https://tcra.go.tz/en_documents/43

to its network facilities, which Infrastructure Seeker can refer to the Authority for resolution.

IX. Kenya

3.59 Kenya's licensing framework consists of three main technology-neutral licenses:

3.60 *Network Facilities Provider*: authorised to construct, own and operate any form of communications infrastructure (whether satellite, terrestrial, mobile or fixed) within the country. This includes mobile operators, data carrier network operators and local loop providers among others.

3.61 *Application Service Provider*: authorised to provide all forms of services/applications to end users using the networks of NFPs. This includes internet service providers, internet exchange points and GMPCS service providers among others.

3.62 *Content Service Provider*: authorised to provide all forms of contents' services such as information services and data processing services. This includes providers of the premium rate services, credit card validation, audio text services and other web based public commercial information providers.

3.63 Facilities licensee shall facilitate access to network facilities by negotiating access to network facilities by the facilities acquirer, at all times, in good faith; a facilities licensee shall submit a copy of a concluded access agreement to the Commission. A facilities provider shall treat each facilities acquirer on a basis that is non-discriminatory in its provision of facilities, and no less favourable than the treatment which the facilities provider affords to its subsidiaries, its affiliates, or other similarly situated facilities acquirers. However, a facilities licensee may refuse unreasonable requests for access to its network facilities. In that case, a facilities acquirer may apply to the Commission for permission to establish its own network or infrastructure in case facilities are not made available.

3.64 In addition, Submarine Cable Land license is required for landing submarine cable, and International systems and services license is required for the provision of international voice/data services. An operator may be issued multiple commercial licenses.

CHAPTER 4

EXAMINATION OF ISSUES

4.1 As discussed earlier, NDCP 2018 under its 'Propel India' mission, envisages one of the strategies as 'Reforming the licensing and regulatory regime to catalyse Investments and Innovation and promote Ease of Doing Business'. Enabling unbundling of different layers (e.g., infrastructure, network, services, and application layer) through differential licensing is one of the action plans for fulfilling the aforementioned strategy.

A. Existing Licensing Framework

4.2 As per the existing telecom licensing framework in India (introduced in the year 2013), an Indian Company after fulfilling the eligibility criteria can apply for a Unified Licence (UL), and it can take the desired authorizations permitted under UL. UL authorises the licensee to deploy the network and related infrastructure as well as provide services. Only one Unified License is required for all telecom services in the entire country.

4.3 In addition to UL, there is another category of licence called Unified License (Virtual Network Operators) [UL (VNO)]. UL(VNO) is a regime parallel to UL. VNO is the service delivery operators, which provides services of NSO, i.e., UL holder to the end customers.

4.4 Further, a company registered as Infrastructure Provider-I (IP-I) with DoT is permitted to lay telecommunication infrastructure. The existing framework for regulating the telecom infrastructure providers in India is prescribed in the guidelines for 'Registration of Infrastructure Provider Category-I' issued by DoT. As per these Guidelines, IP-I can provide assets such as Dark fiber, Right of Way, Duct space, and Towers on lease/rent out/sale basis to the licensees of telecom services on mutually agreed terms and conditions. In the year 2009, the scope of IP-I registration was enhanced to cover the active infrastructure limited

to antenna, feeder cable, Node B, Radio Access Network (RAN), and transmission system for and on behalf of Unified Access Service Licence (UASL)/Cellular Mobile Service Provider (CMSP) licensees. However, IP-I providers are not permitted to own and share active infrastructure, i.e., these elements should be owned by the TSPs (companies who have been issued license under Section 4 of Telegraph Act, 1885). TRAI has given its recommendations dated 13th March 2020 on 'Enhancement of Scope of Infrastructure Providers Category-I (IP-I)' to the Government. Vide said recommendations, TRAI has recommended to expand the scope of the IP-I providers, and permit them to own, establish, maintain, and work all such infrastructure items, equipment, and systems which are required for establishing Wireline Access Network, Radio Access Network (RAN), and Transmission Links. Once implemented, this would increase sharing of active infrastructure established by IP-I providers resulting in efficient utilization of resources.

- 4.5 The Telecom Commission introduced the Other Service Providers Category in May 1999 under the New Telecom Policy (NTP) to provide services such as tele-banking, tele-trading, e-commerce, etc., by using infrastructure provided by various authorized access providers for non-telecom services. The Telecom Commission, accorded in-principle approval for registration of Call Centers, both International and Domestic, in the country under the above category. Later, services like Network Operation Centers and Vehicle Tracking Systems were also added. As per the Terms and Conditions formulated by the Telecom Commission in February 2000, these Application Service Providers could take telecom resources from authorized Telecom Service Providers, however, they are not allowed to provide switched telephony.

B. Examination of Issues

- 4.6 In their comments to the Pre-consultation Paper, many stakeholders have mentioned that the existing licensing regime supports layered approach. Any further unbundling will make licensing regime more

complex and will impact the ease of doing business. Further, it will be commercially unviable for existing unified licensees to split their functions into different layers. One stakeholder has also mentioned that most of the TSPs have now hived off their tower and fiber infrastructure to separately established IP-I company to promote sharing; further, the sector has also witnessed sharing of spectrum and active infrastructure amongst licensed TSPs; therefore, there is no need for introduction of a new licensing framework. On the other hand, some stakeholders have favoured unbundling of different layers (e.g., infrastructure, network, services and application layer) through differential licensing. The different models suggested by them prescribe different layers such as network infrastructure layer, network service layer, service delivery layer and digital service layer. Though, in the present licensing framework, infrastructure layer is being serviced by IP-Is, network (including infrastructure and service) layer is being served by UL holders, service delivery layer is being serviced by VNOs, but there is lack of proliferation of SDOs/VNOs in the mobile segment. Further, the terms and conditions of VNO license are mostly same as that of Unified License as it has been created using the UL template. Globally, the SDO layer is usually kept at the level of light-touch regulation.

- 4.7 All the layers, except service delivery layer (VNO), that too in access segment, seem to be working effectively. It may be worth mentioning that VNOs have been raising their concern that they have been facing difficulty in getting access facilities from the Access service providers. VNOs have been demanding to make it mandatory for the access service providers to provide access to VNOs. While VNO regime is successful in other licenses/authorisations, only one Access service provider (PSU) has entered into agreement with a few VNOs.
- 4.8 The study of international practices (summarized in Chapter 3 of this paper) shows that most of the countries have separate categories of licenses for Network Service Provider and Service Delivery Operators. The Service Delivery Operators are very lightly regulated. These

countries have a framework or guideline describing how the resources will be provided by the NSO to the SDO. Few countries have made it obligatory for the NSO to part with their resources with SDO in a transparent and non-discriminatory manner. Countries viz. Singapore, Malaysia, and Uganda, have put in place certain obligations or come out with a framework for wholesale mobile access services. In many other countries, Regulators have not prescribed any obligation on network operators, however, the wholesale resources of Network Service Providers are easily available to the Service Delivery Operators in a transparent and non-discriminatory manner. In most of the countries, SDOs/VNOs are prevalent and they do not experience any issues in having arrangements with the Network Operators.

- 4.9 In order to attract investment and strengthen the service delivery segment, one view could be that if the network service layer and service delivery layer are separated by introducing a specific license for network layer alone, the network layer operator would willingly share its network with service delivery operators, thereby resulting in reduction of cost and increased utilization of resources including spectrum. Study of international practices shows that the network operators are also allowed to provide services to the end customers either under the same license or by taking a separate license for service delivery. The issue arises that whether the network operator may be allowed to offer services to the end customers. A network operator will have to buy spectrum at a market determined price for provision of mobile services, and will also have to fulfil the minimum roll-out obligations. In case it is not allowed to offer services to end customers directly, monetization of network and spectrum resourced may not be in its control. This may also lead to inefficient utilization of spectrum. In absence of SDOs/VNOs across the network, the investment may be under-utilized and Return on Investment (RoI) can become a challenge. In case network operator is allowed to provide services itself, mere unbundling of license may not yield the desired results as a company owning

network and providing service also, may not tie up with other service delivery operators. Therefore, in order to make the unbundling effective, there appears to be a need of a framework to be imposed on network operators for provision of wholesale services to service delivery operators.

4.10 While suggesting different layers and their scope, stakeholders suggested that a multi-layered ecosystem be light-touch regulated. In case it is decided to unbundle the network service layer and service delivery layer, there would be many issues relating to scope of service, responsibilities, obligations, regulations, which needs to be deliberated upon.

4.11 In addition, some stakeholders have suggested that in order to facilitate the active infrastructure sharing, payment made by one TSP to another TSP for active infrastructure sharing be allowed as pass-through for calculation of AGR. Sharing of infrastructure and resources leads to increased utilization and reduction of cost for the TSPs. A TSP is required to put in place all the infrastructure required, it can either be through deploying its own infrastructure or by way of sharing the infrastructure already deployed by another TSP. In any case, it is a cost to the TSP. Therefore, there appears to be no merit in the demand for allowing the payment made to another TSP for sharing of active infrastructure as pass through charges for computation of AGR.

4.12 Some stakeholders have requested that UL VNO(AS) licensee be allowed to be parented with two or more NSOs (Access Providers). Multi-parenting relies on multiple host MNOs in parallel. MVNO basically works on a roaming agreement with an MNO for the radio network, if multi-parenting is allowed, the SIM could switch between the parented mobile networks based on the signal strength. Presently, MVNOs cannot go for multiple parenting in India, i.e., an MVNO can tie up with only one MNO in an area for their services. In U.S., MVNOs supporting multiple host networks use only one of them for each device, depending

on the specific phone model and/or SIM card used (except for Google Fi, which switches automatically between the different listed host networks based on factors such as relative signal strength).

4.13 In view of the foregoing discussion, the comments of stakeholders are solicited on the following questions:

Q1. Do you agree that in order to attract investment and strengthen the service delivery segment, Network services layer and Service delivery layer needs to be separated by introducing specific license for Network Layer alone? Please justify your answer.

Q2. Should the Network Services Layer licensee be permitted to take the Service Delivery Category licenses and provide the service? If yes, what kind of restrictions and safeguards are required to be built, in order to protect the competition and innovation in service delivery segment? Please justify your answer.

Q3. Whether certain obligations should be imposed on the existing Unified Licensees, and other measures should be taken to encourage UL licensees to provide their network resources to VNO licensees particularly in mobile service segment? Please suggest the measures in detail.

Q4. In case network layer and service delivery layer are separated by creating separate category of licenses, as proposed in Q1;

a) What should be the scope for Network layer license and Service Category licenses?

b) Out of various responsibilities and obligations enumerated in Unified License, what should be the respective responsibilities and obligations of Network

**layer licensees and Service delivery category licensees?
Please elaborate with justifications.**

- c) What mechanism should be put in place to regulate the access to network services of Network layer licensees by the service delivery Category licensees? Whether certain obligations should be imposed on Network layer licensees to provide the network resources in a time-bound, transparent and non-discriminatory manner?**
 - d) What incentives (for example, lower license fee, lower SUC, etc.) could be provided to Network Layer licensees in the new unbundled licensing regime to encourage the investment in the Network layer? Please justify your answer.**
 - e) Whether the existing Unified Licensees should be mandated to migrate to the unbundled licensing regime, or the new regime should be introduced, while keeping the existing regime continued for existing licensees till the validity of their license, with an option of migration?**
 - f) Whether existing VNO licensees be mandated to migrate to service delivery category licenses as per unbundled licensing regime?**
 - g) Whether service delivery category licensees be permitted to parent with multiple Network Service layer licensees? Please justify your answer.**
- Q5. Any other issue related to the subject may be raised with suitable explanation and justification.**

CHAPTER 5:

ISSUES FOR CONSULTATION

5.1 The comments of stakeholders are solicited on the following questions:

- Q1. Do you agree that in order to attract investment and strengthen the service delivery segment, Network services layer and Service delivery layer needs to be separated by introducing specific license for Network Layer alone? Please justify your answer.**
- Q2. Should the Network Services Layer licensee be permitted to take the Service Delivery Category licenses and provide the service? If yes, what kind of restrictions and safeguards are required to be built, in order to protect the competition and innovation in service delivery segment? Please justify your answer.**
- Q3. Whether certain obligations should be imposed on the existing Unified Licensees, and other measures should be taken to encourage UL licensees to provide their network resources to VNO licensees particularly in mobile service segment? Please suggest the measures in detail.**
- Q4. In case network layer and service delivery layer are separated by creating separate category of licenses, as proposed in Q1;**
- a) What should be the scope for Network layer license and Service Category licenses?**
- b) Out of various responsibilities and obligations enumerated in Unified License, what should be the respective responsibilities and obligations of Network layer licensees and Service delivery category licensees? Please elaborate with justifications.**

- c) What mechanism should be put in place to regulate the access to network services of Network layer licensees by the service delivery Category licensees? Whether certain obligations should be imposed on Network layer licensees to provide the network resources in a time-bound, transparent and non-discriminatory manner?**
 - d) What incentives (for example, lower license fee, lower SUC, etc.) could be provided to Network Layer licensees in the new unbundled licensing regime to encourage the investment in the Network layer? Please justify your answer.**
 - e) Whether the existing Unified Licensees should be mandated to migrate to the unbundled licensing regime, or the new regime should be introduced, while keeping the existing regime continued for existing licensees till the validity of their license, with an option of migration?**
 - f) Whether existing VNO licensees be mandated to migrate to service delivery category licenses as per unbundled licensing regime?**
 - g) Whether service delivery category licensees be permitted to parent with multiple Network Service layer licensees? Please justify your answer.**
- Q5. Any other issue related to the subject may be raised with suitable explanation and justification.**

Government of India
Ministry of Communications
Department of Telecommunications
Access Services Wing
Sanchar Bhavan, 20, Ashoka Road, New Delhi-110001

No: 20-281/2010-AS-I Vol. XII (pt.)

Date:08.05.2019

To,
The Secretary,
Telecom Regulatory Authority of India,
Mahanagar Doorsanchar Bhawan,
Jawaharlal Nehru Marg, Old Minto Road,
New Delhi-110002

Subject: Seeking recommendations of TRAI on strategies of National Digital Communications Policy, 2018 - reg.

The National Digital Communications Policy, 2018 (hereinafter, referred to as, the NDCP, 2018) of the Government of India envisages, *inter-alia*, the following strategies under its 'Connect India' and 'Propel India' missions:

"

1. Connect India: Creating a Robust Digital Communications Infrastructure

...

Strategies:

1.1 Establishing a 'National Broadband Mission – Rashtriya Broadband Abhiyan' to secure universal broadband access

...

- (j) *By Encouraging innovative approaches to infrastructure creation and access including through resale and Virtual Network Operators (VNO)*

2. Propel India: Enabling Next Generation Technologies and Services through Investments, Innovation, Indigenous Manufacturing and IPR Generation

...

Strategies:

...

2.1 Catalysing Investments for Digital Communications sector:

...

(b) *Reforming the licensing and regulatory regime to catalyse Investments and Innovation, and promote Ease of Doing Business by:*

...

v. *Enabling unbundling of different layers (e.g. infrastructure, network, services and application layer) through differential licensing*

...

(c) *Simplifying and facilitating Compliance Obligations by:*

...

v. *Reforming the Guidelines for Mergers & Acquisitions, 2014 to enable simplification and fast tracking of approvals*

...

viii. *Creating a regime for fixed number portability to facilitate one nation – one number including portability of toll free number, Universal Access Numbers and DID numbers*

...

2.2 Ensuring a holistic and harmonized approach for harnessing Emerging Technologies

...

(e) *Ensuring adequate numbering resources, by:*

...

ii. *Developing a unified numbering plan for fixed line and mobile services*

...”

2. Telecom Regulatory Authority of India is, hereby, requested to furnish recommendations, under the terms of the clause (a) of sub-section (1) of Section 11 of the Telecom Regulatory Authority of India Act, 1997 (as amended), in respect of the afore-mentioned items of the NDCP, 2018.

3. For sake of convenience, the strategies/ items under strategies of the NDCP, 2018, on which recommendation of TRAI are being sought, are summarized below:

- (a) Strategy 1.1 (j) of 'Connect India' mission,
- (b) Item (v) under Strategy 2.1 (b) of 'Propel India' mission,
- (c) Items (v) & (viii) under Strategy 2.1 (c) of 'Propel India' mission, and,
- (d) Item (ii) under Strategy 2.2 (e) of 'Propel India' mission.

4. This issues with the approval of the Secretary, Department of Telecommunications, Government of India.


(S.B. Singh) 8/5/18

Deputy Director General (AS)

Tel: 011-23036918