Telecom Regulatory Authority of India

Recommendations

on

Cloud Services

New Delhi, India

14th September 2020

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CONTENTS

ANNEXURES

CHAPTER 1
INTRODUCTION

A. Background

1.1 The growth of cloud computing services in the last decade has transformed the way governments, enterprises, and consumers, store and process their data and manage their resources. India's cloud computing market is poised for growth, and the technology is increasingly being embraced across businesses as well as retail consumers. Complementing the ecosystem are futuristic technologies such as AI (Artificial Intelligence), ML (Machine Learning), advanced analytics, and immersive media, which aid in the seamless adoption of Software as a Service (SaaS), Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) offerings. Emerging trends are making cloud an integral part of the new and existing technologies, and new business models may help in adoption of cloud in the future, like the consumption-based model, everything as a service (XaaS) model, etc. National Digital Communications Policy (NDCP)[1] 2018 has envisaged the following strategies for the growth and development of Cloud Services in India:

a) *"Evolving enabling regulatory frameworks and incentives for promoting the establishment of International Data Centres, Content Delivery Networks and independent interconnect exchanges in India."*
b) *"Enabling a light-touch regulation for the proliferation of cloud-based systems."*
c) *"Facilitating Cloud Service Providers to establish captive fibre networks."*

1.2 On 'Cloud Services,' including the regulatory framework for Cloud Services, TRAI has sent its recommendations to the Government of India on 16th August 2017. These recommendations were sent in response to the

[1] https://dot.gov.in/sites/default/files/Final%20NDCP-2018_0.pdf

reference from the DoT on the subject. Among other recommendations, it included the Legal and Regulatory framework for Cloud Services, Interoperability, and the Legal framework for CSPs operating in multiple jurisdictions. As a part of these recommendations, it was mentioned that if the Government accepts the recommendations on the legal and regulatory framework then the recommendations on other aspects such as the terms and conditions of the registration of industry body, eligibility, entry fee, period of registration, and governance structure, etc., would be sent subsequently. The government accepted all recommendations, which was communicated vide DoT letter dated 6th May 2019 (refer to **Annexure I** of these recommendations for details).

B. Recommendations sought by DoT

1.3 As the Government has accepted TRAI's recommendations on the legal and regulatory framework on 'Cloud Services,' DoT sent a reference to seek recommendations on the framework for CSPs' industry body on 27th September 2018 **(Annexure II)**. Recommendations sought on *"the terms and conditions of registration of Industry body, Eligibility, entry fee, the period of registration, and governance structure, etc."*

C. Consultation with stakeholders

1.4 Pursuant to the reference received from DoT, TRAI issued a consultation paper on 23rd October 2019, and raised various issues for consultation from stakeholders (refer to **Annexure III** for issues of consultation in detail) such as any capping required on the number of industry bodies, requirements for an industry body to get registered with the DoT, requirements for any CSP to become a member of the industry body, fees to be paid by the members to the industry body, governance structure of the industry body, and how to seed an industry body. As TRAI has already sent its recommendations earlier on the other issues related to Cloud Services, the scope of the consultation paper was restricted only to additional issues on

which DoT has sought the recommendations of TRAI. Last date for submission of the comments was 4th December 2019, and for the submission of counter-comments was 18th December 2019.

1.5 Stakeholders submitted their response(s) to the Authority (TRAI) on the issues raised in the consultation paper. Comments and counter-comments of stakeholders are available on TRAI's website: www.trai.gov.in. Subsequent to it, an Open House Discussion (OHD) was held on 28th February 2020 at Delhi, where stakeholders participated and deliberated on the issues.

1.6 **Structure of this document**

Chapter 2 deals with the responses received from various stakeholders during the consultation process under separate sections for specific and broad-level responses of the stakeholders. Stakeholders' broad-level responses have been analyzed in detail in Chapter 3. It deliberates on the regulatory approach for cloud service, and also the convergence of cloud and telecom, presents facts about the ambit of TRAI to deal with the issues related to Cloud Services and concerns of the customers need to be addressed. In Chapter 4, responses of stakeholders on specific issues have been analyzed, and it presents the Authority's recommendations on the issue. Chapter 5 summarizes the Authority's recommendations on the subject.

CHAPTER 2
RESPONSES OF THE STAKEHOLDERS

2.1 During the consultation process, the Authority has received responses and inputs from various stakeholders. It includes the comments and counter-comments received against our consultation paper dated 23rd October 2019, responses received during the Open house discussion arranged by the Authority on 28th February 2020, and other responses received from the stakeholders during this consultation process. For the sake of convenience, responses of the stakeholders on the issues have been divided into two parts, which are: issue-specific responses and broad-level responses. Subsequent paras provide further details about the responses of the stakeholders.

A. Issue-wise response of the stakeholders

2.2 Stakeholders responded to specific issues raised in the consultation paper. Six main issues were raised in the consultation paper, and the stakeholders' responses, in brief, are given below (detailed complete responses are available on TRAI's website: www.trai.gov.in):

a) The requirement of putting a cap on the number of industry bodies of cloud service providers

i. One of the stakeholders suggested that only one industry body should be established for cloud service providers with DoT/TRAI acting as an apex/governing body. Another stakeholder proposed a cap of three on the numbers of industry bodies that may be formed. However, in general, most stakeholders opposed the setting up of an industry body. Their claim was that CSPs are already regulated by a set of legal and regulatory frameworks such as the Information Technology Act, 2000, and its intermediary rules, the Consumer

Protection Act, 2019, and the proposed Personal Data Protection Bill, 2019, etc. They argued that there was no need for setting up of industry bodies to regulate CSPs.

b) *Eligibility criteria, entry fee, period, and terms and conditions of registration of CSPs' industry body with DoT*

i. On this issue, the response of some of the stakeholders was that the industry body may be responsible for various activities such as the Code of Conduct, transparency requirements, disclosures, audit, etc.

ii. Most of the stakeholders were in agreement that the CSPs' industry body should be not-for-profit, and registered under the section 8 of Companies Act, 2013, or Societies Registration Act, 1860. The vision and mission statement of such an industry body should be in alignment with the objectives for which it is being set up. Some stakeholders suggested documents such as proof of registration, Memorandum, and Articles of Association, governance structure, CoC, etc. should be required in support of their eligibility for registration.

iii. In general, the stakeholders did not propose a registration fee for an industry body while registering with DoT. Regarding entry fee for membership of CSPs under the industry body, some responses were received and are deliberated under item (d) below. One of the stakeholders suggested that the validity of the registration period should be for a longer period, e.g., 20 years, similar to the license period of a telecom service provider or in the case of registration of an OSP (The period of registration for an OSP is 20 years initially, and after renewal, it may be extended further for 10 years).

c) *The threshold value of parameters to mandatorily become a member of a registered industry body*

i. Most of the stakeholders opined that the determination of the

threshold value of parameters may be left for the industry to decide. Few stakeholders suggested that the threshold value of the parameter may be based on the volume of business or revenue of CSPs, but as such, no specific values or range of values were suggested.

d) *Entry fee, the recurring fee for members based on the type or category of members*

i. Regarding the entry fee for membership of CSPs under industry bodies, some stakeholders submitted that the entry fee should be low for SMEs' and higher for MNCs. They also suggested that DoT may put a cap on the entry fee for membership to have uniformity. But none of the stakeholders suggested any specific values or range of value for this purpose. Most of the stakeholders were of the opinion that the membership fee or entry fee for a CSP should be left up to the industry body to decide.

e) Governance structure or guiding principles of the industry body

i. In the opinion of most of the stakeholders, the structure and governance of the industry body should be left up to them to decide as per the requirements. One of the stakeholders commented that in case of formation of any Study Industry Group (SIG), it should be chaired by a member of the Governing Board. Some of the stakeholders also suggested a second layer of governance structure as Executive Committee responsible for the day-to-day operation and monitoring of compliance by CSP members such as with the CoC or other guidelines/directions issued by the DoT/Authority. One stakeholder suggested that the governance structure should include board and management. Board may be elected by the general body of members based on one vote per member, with memberships divided into different types of CSP reflecting the different types of services in the market. Management may be

headed by a full-time professional, responsible for the operations of the industry body.

f) *Policy for the initial formation and seeding of the industry body for cloud services*

i. Most of the stakeholders had the view that CSPs should be allowed to form their own body and adopt their Code of Conduct. Few stakeholders had the opinion that initially, establishing an industry body may require the formation of an *ad hoc* body by the DoT. This may be done by calling for representations from different categories of membership. Subsequently, an elected body of the industry body may take over and develop the necessary governance structure. To form and run it, DoT/government may provide the initial necessary grant and monitor the process by becoming part of the initial committee. One of the stakeholders suggested that the government may identify and recognize an existing not-for-profit industry body and approve its memorandum and by-laws. It was also suggested that once such recognized industry bodies are formed, then it may invite major CSPs, including those identified by DoT/the Authority, to become its members. It was further suggested that a specified timeline may be prescribed for the industry body for various activities such as developing CoC, CoP, other processes, and to carry out its day-to-day operations.

B. Other broad-level responses of the stakeholders

2.3 In general, CSPs and their associations opposed establishing a regulatory framework for CSPs. They captured it in their comments submitted to the Authority and voiced their opposition during the Open House Discussion (OHD).

2.4 Their opposition to a regulatory framework is on the grounds that they are already subjected to various existing Indian laws, which are Information

Technology Act, 2000; Consumer Protection Act, 2019; and the proposed Personal Data Protection Bill, 2019. They also claimed that while cloud computing is provided using the infrastructure of the telecom licensees, it is not a telecom service, rather it is an information technology service. Consequently, the governance of CSPs in any form falls squarely within the jurisdiction of the Ministry of Electronics and Information Technology ("MeitY"). As per them, MeitY is tasked with developing policies for information technology and the Internet under the Allocation of Business Rules[2].

2.5 Moreover, they also disputed the ambit of TRAI to create a regulatory framework for CSPs. They argued that the cloud service providers ("CSPs") should not be subject to regulation by the Department of Telecommunications ("DoT") or the Telecom Regulatory Authority of India ("TRAI"), directly or indirectly. In their opinion, the scope of work of DoT and TRAI specifically covers only telecommunication-related matters. The ambit of TRAI Act, 1997, (hereinafter referred to as the "TRAI Act") to as and Telegraph Act, 1885, (hereinafter referred to as the "Telegraph Act") does not cover cloud services was also argued on the basis that under the Allocation of Business Rules, the DoT deals with "policy, licensing and coordination matters relating to telegraphs, telephones, wireless, data, facsimile and telematics services and other like forms of communication". TRAI's functions are related to the telecommunication services and telecom service providers licensed under the Indian Telegraph Act.

2.6 Another point raised by the CSPs and their associations while opposing establishing an industry body was the ambiguity about the meaning of light touch regulation, and in their opinion, registration of CSPs under industry

[2] Pg. 51, Government of India (Allocation of Business Rules), 1961, (as amended up to 4th April 2019), available at: https://cabsec.gov.in/writereaddata/allocationbusinessrule/completeaobrules/english/1_Upload_1829.pdf ("Allocation of Business Rules")
[MeitY– Policy matters relating to the information technology; Electronics; and Internet (all matters other than licensing of Internet Service Provider); Promotion of Internet, IT and IT-enabled services].

body is not a light touch regulatory approach. Since they do not consider it as a light touch approach, the approach is in contradiction with the NDCP-2018, which envisaged the light touch regulation. They further argued that setting up of an industry body is not a light touch regulation approach as the industry body would be required to impose a mandatory Code of Conduct (CoC) on CSP members, to comply with orders and directions issued by DoT and to furnish information to DoT/TRAI on demand. They expressed their apprehension that establishing such a registered industry body instead of promoting cloud services will negatively impact the growth of the cloud service industry.

2.7 The objective behind setting up a co-regulated industry body for CSPs is to safeguard the interests of the cloud users, which, in their opinion, is already addressed sufficiently via SLAs between the CSPs and customers. It was argued that it may also not be feasible to provide general guidelines for addressing customers' concerns, as cloud services are a 'business-to-business' service and are usually customized as per the buyer's needs.

CHAPTER 3
REGULATORY APPROACH FOR CLOUD SERVICES

3.1 Key points from broad-level responses of the stakeholders

a) As discussed in Chapter 2, the following few key points were argued by the representatives of CSP industry to oppose the regulation of Cloud Services:

i. *Cloud services are not part of the telecom sector;*
ii. *Creation of a regulatory framework for CSPs does not fall within the ambit of the Telegraph Act and the TRAI Act;*
iii. *CSPs are already governed under the provisions of the IT Act and other existing laws;*
iv. *Approach of registration of CSPs' industry body with DoT is not a light touch regulation.*

b) Before making further recommendations to the government, the Authority reviewed the points raised by the industry to oppose any kind of regulation of cloud services. The following para presents related facts and an analysis of the issues.

A. Are cloud services not part of telecom?

3.2 What's common between cloud and telecom?

a) ITU recommendations[3] defines *"Cloud service as one or more capabilities offered via cloud computing invoked using a defined interface, where cloud computing means Paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand"*. Cloud service is a broad term that covers all delivery and service models of cloud computing and related solutions. With the evolution of telecom and

[3] https://www.itu.int/rec/T-REC-Y.3500-201408-I

Information Technologies, the line segregating telecom infrastructure from IT infrastructure is very diffuse and impossible to define.

b) End customers are using services which are offered by Cloud Service Providers, and which heavily depend upon the performances of TSP's networks. From an end user's perspective, what matters is the end-to-end performance of service delivery infrastructure. To improve performances and build adequate capacity to serve the customer with good quality of experience, TSPs and CSPs may require collaborating, co-designing and co-developing the service delivery network. As traffic of cloud services is growing rapidly, the requirement of cloud infrastructure is increasing day by day, and it does not only require expansion of capacity but also requires to be geographically more pervasive, i.e., spread across the country, which earlier used to be limited to few points in the country.

c) On the other hand, services offered by telecom service providers to end customers are heavily dependent upon the performance of CSP's infrastructure, as with the introduction of 4G (later versions) and 5G networks, Telecom Service Providers are also using cloud infrastructure for their own purposes, such as to build and operate their core and radio networks/ functionalities. Functionalities such as Cloud-based Radio Access Networks, Software Defined Networking (SDN), Network Function Virtualization (NFV), Mobile Edge Computing (MEC), etc., are also being introduced by TSPs in their networks. Convergence is happening not only at the infrastructure level but also at the level of protocols used in the networks by IT and the telecom world. User agents are also converging, and same or similar user agents are being used by IT applications and the telecom world.

3.3 Cloudification of telecom and blurring of boundaries

a) Telecom space has traditionally been regulated and bound to comply with certain regulations. With the blurring of boundaries, services may

either move from telecom space to cloud space or may be a mix of both. Currently, telecom is monitored for its performances as a part of the regulations, while cloud services are not subjected to the same or similar regulations. Unnoticed transition of services from regulated to unregulated domain and that too without appropriate considerations of impact of such transitions on the protection of the interest of the customers is a matter of concern for the telecom sector. There is a need to have an oversight and an institutional mechanism that keeps an eye on the latest development happening in the cloud space as well as in the telecom space to continually take adequate and timely measures to protect the interests of the customers. The facts need to be recognized that performance of service delivery is now a mixture of performance of the infrastructure deployed by CSP and TSP. It is difficult to differentiate the responsibilities of CSP and TSP, which would create serious issues in achieving the performance objectives or other regulatory provisions already laid out for the telecom users. In the coming years, it would almost be impossible to demarcate and assign responsibilities between cloud and telecom service providers from a regulatory perspective. It is necessary to examine issues related to the cloud services and come up with the measures which will help the Government to respond appropriately as and when required to do so.

B. Do the cloud services not fall under the ambit of TRAI Act and Telegraph Act?

3.4 The ambit of TRAI

a) Regarding the point raised about the ambit of TRAI, and the argument raised by the industry that the creation of the regulatory framework for "Cloud Services" is not under the ambit of TRAI, there is a need to refer to Section 2(k) of the TRAI Act, 1997, which defines *"telecommunication service as service of any description (including electronic mail, voice mail,*

data services, audio tex services, video tex services, radio paging and cellular mobile telephone services) which is made available to users by means of any transmission or reception of signs, signals, writing, images and sounds or intelligence of any nature, by wire, radio, visual or other electro-magnetic means but shall not include broadcasting services." Also, The Indian Telegraph Act, 1885, defines "*telegraph as 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 where Radio waves or "Hertzian waves" means electro-magnetic waves of frequencies lower than 3,000 giga-cycles per second propagated in space without artificial guide*". The phrase "*… service of any description (including electronic mail, voice mail, data services, audio tex services, video tex services, radio paging and cellular mobile telephone services) which is* ***made available to users by means of any transmission*** *or reception of signs,…*" clearly includes the services provided by the CSPs. The definitions include the services provided by the "Other Service providers" as well, which is deliberated upon below.

b) It may be noted that TRAI has sent its recommendation under the TRAI Act, 1997, on various services other than the Access services, for example, in case of OSPs and VNO. The nature of business and services of CSPs is akin to "*Other Service Provider*" which are defined by the DoT in 2008 guidelines of DoT[4], "*as a company providing Application Services wherein "Applications Services" means providing services like tele-banking, telemedicine, tele-education, tele-trading, e-commerce, call centre, network operation center, and other IT-Enabled Services by using Telecom Resources provided by authorized telecom service providers*". The CSPs, to provide their services are also majorly dependent on

[4] https://dot.gov.in/sites/default/files/OSP%20registration070808.pdf

telecom services. With the introduction of 4G later versions and 5G networks, TSPs are using cloud infrastructure to build and operate their core and radio networks/functionalities such as Cloud-based Radio Access Networks, Software Defined Networking (SDN), Network Function Virtualization (NFV), Mobile Edge Computing (MEC), etc., are being introduced by TSPs in their networks. The TSPs themselves have started providing cloud-based services like Airtel TV and JioTV. A CSP that intends to provide infrastructure, platform, IMS, Switching, Core Network, NFV, SDN etc. related to Telegraph as defined in India Telegraph Act, 1885 as amended and Telecommunication Service as defined in TRAI Act, 1997, is required to be covered under regulatory/licensing framework. TRAI vide its recommendations dated 21st October 2019 on 'Review of Terms and Conditions for registration of Other Service Providers (OSPs)', recommended that Hosted Contact Centre should obtain registration / license from DoT as it is a category of CSP in which the CSP hosts a common centralized EPABX service at the cloud (known as Hosted Contact Centre) and is currently required to obtain OSP Registration from DoT. Hence, CSPs are not different from OSPs and can be brought under the purview of DoT/TRAI.

c) Another example can be the introduction of Virtual Network Operators (VNOs) into the telecom sector. VNOs are service delivery operators, who do not own the underlying core network but rely on the network and support of the TSPs/infrastructure providers for providing telecom services, which are being provided by the existing telecom service providers. The VNOs were introduced to the telecom sector after recommendations from TRAI dated 1st May 2015. A separate kind of licensing was introduced called UL (VNO), where VNO can start operating in the Indian telecom sector after acquiring License from DoT and also periodically comply with terms and conditions of the UL (VNO).

3.5 The need to regulate CSPs

a) As discussed in the previous paras, cloud infrastructure and services cannot be separated from the telecom infrastructure and services from a regulatory perspective. With convergence, TRAI needs to make regulatory interventions as and when required in case of cloud services to protect the interests of customers. TRAI, under its ambit, as provided in the TRAI Act and the Indian Telegraph Act, can make recommendations to the Government on Cloud Services. And DoT can consider its recommendations to introduce appropriate measures or institutional mechanisms to deal with the issues related to "Cloud Services".

C. *Regulatory impact of cloudification of telecom on the customers' interests*

3.6 Whether CSPs are already being regulated to address the end-customers' concerns?

a) As discussed in section 2.1, the industry expressed that CSPs are already being regulated under the provisions of the Information Technology Act, 2000, (IT Act)[5]. However, the provisions of the IT Act do not address the concerns of the end customers of CSP rather provisions are there to protect the interests of intermediaries, i.e., CSPs in the current context. As per the preamble of the IT Act, the purpose of the IT Act is to give legal recognition to electronic mode of data transfers and communications, and also to cover those intermediaries based upon those electronic modes from any security breach and cybercrimes.

b) Also, Section 2(1)(w) of the IT Act, 2000, defines "intermediary" which includes various service providers such as the network service providers, internet service providers, web-hosting service providers,

[5] https://www.indiacode.nic.in/bitstream/123456789/1999/3/A2000-21.pdf

search engine service providers, online payment service providers, online-auction service providers, online-marketplace service providers, and cybercafé service providers. Thus, for an entity to be an "intermediary", it has to first be a service provider. The fact that there is no definition of service provider under the IT Act leads to the interpretation that the IT Act does not define service provider. As per section 6A of the IT Act, all such service providers that are included in the definition of "intermediary" must first have permission by the government to offer services through electronic means and must be governed by a sector-specific policy governing such service sector.

c) Also, Chapter XII of the IT Act consists of section 79, which is titled as "Exemption from liability of intermediary in certain cases," accords great importance to the protection of "intermediaries". From a bare perusal of section 79 of the IT Act, it transpires that the obligations cast on an "intermediary" to enjoy immunity are generic and agnostic to the services provided by the "intermediary". Therefore, all such service providers, including Cloud Service Providers have certain protections and liabilities as an "Intermediary" that are commensurate with the objectives of the IT Act. The IT Act is an umbrella act, which instead of regulating intermediaries to protect the interests of end customers, protects the service providers in their role as intermediaries from certain liabilities.

d) Other laws mentioned by stakeholders, in para 3.1, were Consumer Protection Act, 2019,[6] and the proposed Personal Data Protection Bill, 2019. Both the laws have specific purposes and are applicable on all service providers including cloud and telecom service providers. They don't specifically deal with all the challenges of the cloud service sector. As discussed in para 3.3, with the evolution of telecom and cloud

[6] http://egazette.nic.in/WriteReadData/2019/210422.pdf

technologies, the industry is seeing cloudification of telecom, and over a period, it will be impossible to differentiate between the telecom and cloud infrastructures. The Consumer Protection Act, 2019, defines "*electronic service provider as a person who provides technologies or processes to enable a product seller to engage in advertising or selling goods or services to a consumer and includes any online market place or online auction sites".* It deals with unfair trade practices; however, it cannot deal with service-specific concerns of consumers or end users such as quality of service, etc. Concerns of Customers of cloud services are discussed in paragraph 3.7. The proposed Personal Data Protection Bill, 2018,[7] is related to the protection of personal data as an essential facet of informational privacy. It would be applied to the processing of personal data where such data has been collected, disclosed, shared, or otherwise processed within the territory of India, and processing of personal data by the State, any Indian company, any Indian citizen or any person or body of persons incorporated or created under the Indian law. Similar to the IT Act, other mentioned laws are also umbrella acts, which would be applicable on all service providers of the digital ecosystem, including telecom service providers.

3.7 Regulatory interventions required to address concerns of cloud-service users

a) Other than privacy and data protection, there are many issues and concerns, which cloud-services users face and are similar to users of other services such as traditional telecom services. Areas of concern in case of cloud services were already highlighted by TRAI in its earlier recommendations on cloud services in 2017. Some of these were listed as part of the Code of Conduct (CoC), for example, transparency measures to deal with information asymmetry, measures to deal with

[7] https://meity.gov.in/writereaddata/files/Personal_Data_Protection_Bill%2C2018_0.pdf

Quality-of-Service-related (QoS) issues, Service-level-agreements-related (SLAs) issues in case of B2B and B2C consumers, protection from Bill shocks/disputes, transparency in complaint redressal system performances, interoperability- and interworking-related issues. Cloud-service users also face issues if they wish to port between CSPs, and the intricacies involved are more challenging than is the case with Mobile Number Portability (MNP), as it involves changes in the schema of data, changes in execution environment in addition to payment or account-balance-related issues. To address such concerns, the Authority in its earlier recommendations in 2017 recommended the requirements of Code of Conduct(s) (For details refer to **Annexure IV**). Institutional mechanisms such as formation of industry body(ies) to publish documents, monitor performances, etc., were also recommended.

3.8 Whether the IT Act is meant to address the cloud-service users' concerns?

a) As of now, cloud service providers are not being regulated, although they are required to meet the conditions stipulated in the IT Act as intermediaries and few other umbrella laws. The IT Act prescribes requirements from the perspective to protect the interest of an intermediary and not of cloud-service users. Unlike licensing/ regulatory requirements stipulated for a TSP, the IT Act does not cover various aspects that are important to protect the interests of a cloud user and that should be met by CSPs. There is a need to have a regulatory intervention to protect the interest of cloud users.

D. Regulatory interventions to protect the interests of the customers not to be counterproductive

3.9 Keeping in view the nature and the evolving stage of the industry, TRAI recommended light touch regulation with minimum regulations through its recommendation dated 16th August 2017. The idea was to address the concerns of cloud-services users, and, at the same time, not to be counterproductive. To adopt light touch regulation, an industry-led approach was recommended. In this approach, DoT may prescribe a framework for registration of CSPs industry body(ies), which are not-for-profit. This industry body(ies) would have CSPs as its members. The industry body would be responsible for certain deliverables as mentioned in the Code of Conduct (CoC), and to carry out any additional tasks as and when asked by DoT/TRAI.

3.10 However, industry expressed that the approach of formation of industry bodies as recommended by TRAI is not a light touch regulatory approach. Their arguments to not consider it as a light-touch regulatory approach were imposition of certain obligations on CSPs via the industry body to follow a mandatory Code of Conduct (CoC), comply with the orders and directions issued by DoT, and furnish information to DoT/TRAI on demand. In their view, instead of promoting the 'self-regulatory' approach developed by the industry members themselves, such a registered industry body will negatively impact the growth of the cloud-service industry. To analyze and consider the points raised by the CSPs or their association, it is required to understand what light touch regulation means.

3.11 What is light touch regulation?

a) There is no universally accepted, unique definition of light touch regulations. To get a fair idea of this concept, practices and approaches adopted by regulators in other parts of the world may be referred to. From that, it will become clear that light touch regulation does not mean no regulation, rather it means the use of alternative regulatory mechanisms in place of a specific legal instrument. The regulatory

regime is a continuum of regulatory measures, and light touch regulations may be referred to as a space within the full spectrum of the regulatory regimes.

b) For example, as per the Organisation for Economic Co-operation and Development (OECD) these mechanisms may include the participation of industry sectors in the regulation process such as self-regulation[8]. The OECD[9] defines self-regulation as groups of firms in a particular industry or entire industry sectors that agree to act in prescribed ways, according to a set of rules or principles. Participation by firms in the groups is often voluntary but could also be legally required. Self-regulation involves a group of economic agents, such as firms in a particular industry or a professional group. This group voluntarily develops rules or codes of conduct that regulate or guide the behaviour, actions, and standards of its members. The group is responsible for the development monitoring, compliance with, and enforcement of self-regulatory instruments. There may be the Government's involvement in the development of self-regulatory arrangements, taking the form of advice or participation by officials in the discussions establishing the scheme. However, there is no formal legislative backing or Government responsibility for the scheme.

c) In another example, EU Inter-institutional Agreement on better-law making (IIA) has set out the procedure[10] for the use of self-regulation. First, the IIA indicates that voluntary initiatives under self-regulation do not imply that the institutions adopt any particular stance, including the initiatives which are undertaken in areas not covered by the Treaties or in areas which the Union has not hitherto legislated.

[8] https://ec.europa.eu/digital-agenda/en/content/mapping-self-and-co-regulation-approaches-eu-context

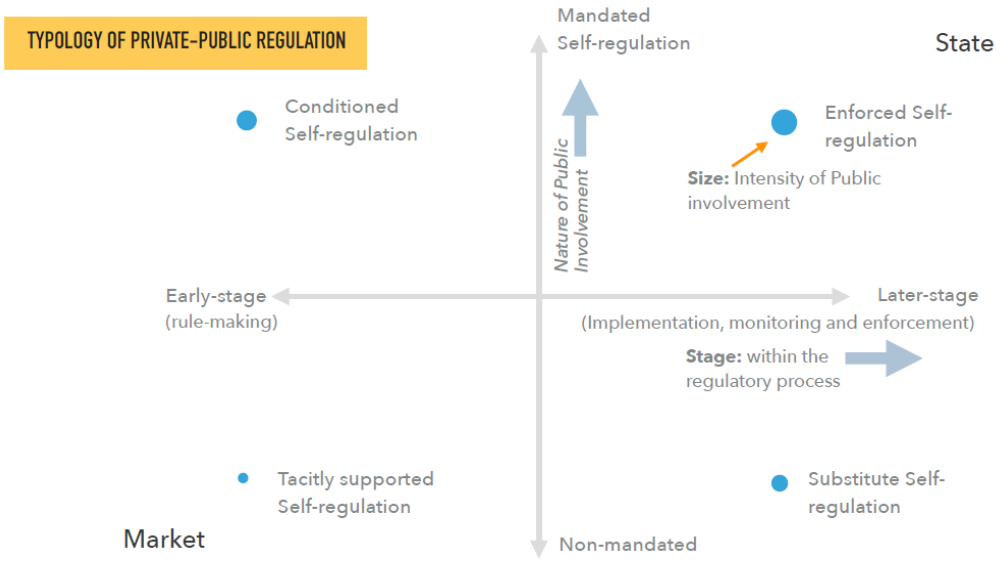
[9] The Organisation for Economic Co-operation and Development (OECD) is an international organisation with 37 member countries that works to build better policies for better lives. https://www.oecd.org/about/

[10] https://www.eesc.europa.eu/en/documents/mapping-self-and-co-regulation-approaches-eu-context

Secondly, the IIA states that the Commission will scrutinize self-regulation practices to verify that they comply with provisions of the EC Treaty.

d) As per the study undertaken for the European Commission (DG CONNECT), private forms of regulation, and especially the pure forms thereof are rarely found. Co-regulation is used to refer to a "whole spectrum of regulatory set-ups between the two extremes of pure self-regulation and pure state regulation". Based on an in-depth analysis of existing typologies on self-regulations, three distinct analytical factors have been elaborated to systemize the broad spectrum of private-public self-regulation. The positioning of self-regulatory instruments within the three-dimensional typology of private-public regulation depends on the stage of public involvement (reflected by the horizontal axis), the nature of public involvement (reflected by the vertical axis), and the intensity of public involvement (reflected by the dot size). These are illustrated in Figure 1, which shows how hybrid forms of private-public self-regulation can be arranged according to these analytical factors.

Figure 1: Continuum of the regulatory regime of self-regulation[11]



[11] ibid

e) In the three analytical criteria, self-regulatory regimes can further be arranged according to the key interests involved in the establishment of the respective regimes. While market interests are likely to serve as the key driving force for the establishment of non-mandated forms of self-regulation, safeguarding public interests by an explicitly attributed role of the state remains a constitutive element for the adoption of mandated self-regulatory arrangements. Based on these analytical distinctions, private-public regulation can be of four broad categories:
   i. Non-mandated self-regulation, with public involvement at a relatively "early" stage within the policy cycle;
   ii. Non-mandated forms of self-regulation, with public involvement at a "later" stage within the policy cycle;
   iii. Mandated self-regulation, with public involvement at an "early" stage within the policy cycle; and
   iv. Mandated self-regulation, with public involvement at a "later" stage within the policy cycle.

f) In the EU vocabulary, these categories fall under the following types of private-public self-regulation, as defined in the IIA[12]:
   i. **Tacitly-supported self-regulation**: This form is of privately initiated self-regulation without or with little explicit Government involvement, but the Government's implicit role can be influential. This type of self-regulation comes closest to "pure" or "voluntary" self-regulatory arrangements. However, it must be distinguished, since, in this, public involvement exists only in an implicit way.

   ii. **Substitute self-regulation**: It is a non-mandated form of self-regulation, with public involvement at a "later" stage within the policy cycle. Forms of substitute self-regulation leave the initiative

[12] ibid

on the side of the private actors, but the government watches the process to safeguard the public interests that may be at stake.

iii. **Conditioned self-regulation**: It is a kind of mandated self-regulation, with public involvement at an "early" stage within the policy cycle, including conditioned self-regulation, sponsored self-regulation, consensual self-regulation, and regulated self-regulation. The legislator sets out procedural framework criteria within which industry is free to develop their own rules. Government has a prominent role in controlling the end result.

iv. **Enforced self-regulation**: It is a mandated self-regulation, with public involvement at a "later" stage within the policy cycle. Enforced self-regulation is a form of subcontracting of regulatory functions (legislative, executive, or judicial) to private actors. Retaining public enforcement (detection and punishment) of private standards is likely to be an important element in the private self-enforcement.

3.12 How to discover the best fit regulatory approach?

a) Considering that light-touch regulation is a subspace within a continuum of spectrum of regulatory regime, the Authority is of the view that the legal and regulatory framework needs to be flexible enough to adapt continually to keep itself at an appropriate point. The earlier recommendations of TRAI prescribing formation of a body led by the industry and regulatory interventions from DoT/TRAI as and when required brings the right balance to consider both sides, i.e. the CSP's side and the cloud-users' side.

b) Appropriate points for light-touch regulations would depend upon country-specific contexts such as private and public involvement, what is best suitable for the cloud industry, consumers, and national

interests. In cloud space, things are changing very fast, and it becomes challenging to match the pace of legislative requirements with the market needs. The typical time for introducing new requirements via a route of legislative acts takes much longer than the time taken to change sub-legislative regulations. Regulations complement legislative acts by helping to bring changes quickly and flexibly. In the regulatory space, there is a continuum from one extreme of having statutory regulations to another extreme of completely free market-driven mechanisms. Finding a regulatory regime that best fits is yet to be discovered by the concerned stakeholders, and may require establishing an institutional mechanism to guide for reaching the optimum point. The optimum point may change with the change in the landscape of players in the ecosystem, and with the change in power dynamics. It may also require external interventions, to ensure that the interests of the customers are not compromised with.

c) In view of the above, the authority is of the view that there is no universally accepted definition of light-touch regulations, as there is a continuum of the regulatory regimes from one extreme to another. **Thus, the Authority recommends that a registered industry body working in conjunction with DoT/TRAI would enable the stakeholders to discover the right spot in the continuum and reiterates that it does indeed constitute light touch regulation.**

3.13 How to begin with?

a) Although to ensure that there is freedom in the functioning of such industry bodies and such bodies should not become the monopoly of few big entities, no restrictions on the number of such industry bodies should be imposed. However, placing no cap on the number of industry bodies may also face conflicting situations where many such bodies independently function in the overlapping area. Therefore, as

mentioned in Chapter 1, the issue related to the number of industry bodies, a cap on the number of industry bodies, and industry bodies registered based on category or type of CSPs was raised in the consultation paper. As discussed in para 1.2 stakeholders suggested that:

i. There may be a single industry body or multiple industry bodies with a cap of three at the initial stage. In case of multiple bodies, these may be classified based on the type of cloud service such as SaaS, PaaS, IaaS, etc., or sectors such as banking, health, etc. To comply with regulatory requirements, CSPs would be required to get a membership with an industry body, which is working in their field of cloud computing and get registered with DoT. So, the presence of at least one industry body would be the first steppingstone for the implementation of this regulatory framework. In this regard, the Government may establish a framework for the formation of the first industry body at the initial stage, and later, allow multiple industry bodies to register with DoT, based on the experience gathered during the formation of the first such body.

b) Initially, DoT may establish an *ad hoc* industry body calling for a representative from different categories of membership. The Government may identify and recognize an existing not-for-profit industry body, and approve its memorandum and by-laws.

c) So, in pursuit of the best fit light-touch regulatory framework for cloud services in India, the Government may start with the formation of one industry body at the initial stage and later move towards registration of multiple industry bodies and their code of conduct. It may be considered as the Government's involvement in the early stage of establishing a private-private self-regulatory framework.

3.14 Recommendations of the Authority

In view of the above, the Authority reiterates its earlier recommendations on light touch regulatory approach of establishing the industry body(ies). However, the first body would be required to be established by DoT, and multiple industry bodies will be considered at a later stage. In view of the above, **the Authority recommends that DoT may initiate setting up of the first industry-led body and require all CSP's to become its members. This body would lay down broad principles and procedures to aid its functioning. The industry body so created may review its experience and further deliberate upon the need to form multiple bodies for different purposes, such as to address requirements of different market segments. DoT may require this review after two years of commencement of the functioning of the first industry body, or such time as it considers appropriate.**

CHAPTER 4
FORMATION OF INDUSTRY-LED BODY AND ITS GOVERNANCE

A. Begin with one body

4.1 Stakeholders' comments on the formation of industry body

As mentioned in Chapter 2, stakeholders commented on different options for seeding of formation of the industry body. One of the options for the initial formation of the industry body was suggested by the stakeholders that the Government (DoT) may establish an *ad hoc* industry body by calling representatives from different categories. On enrolling these representatives, founding members from each category of membership are elected/selected by the members themselves with DoT supervising the process. This elected/selected body of members would develop the necessary structure and will be responsible for the formation and registration of the body. The initial committee may have a representative from DoT and other Government representatives, and they would be required to initially provide the necessary grant and monitor the process of formation of the industry body.

4.2 The approach of formation of industry body in EU

a) There are some industry bodies where Government bodies were involved in initial drafting like TSDSI, EU framework related to Cloud, etc. In Europe, Directorate-General of the European Commission established the Cloud Select Industry Group (C-SIG) with representatives from the major European and multinational companies and organisations with significant involvement in cloud computing to provide independent validations, and advise on proposals related to cloud computing being considered by the European Commission.

b) Key action points of European Cloud Strategy 2012[13] were cutting through the jungle of standards, development of model safe, and fair contract terms, and a European Cloud Partnership to drive innovation and growth for the public sector. DG CONNECT formed various industry groups for the implementation of the said strategy, which includes C-SIG on Service-Level Agreements, C-SIG on Certification Schemes, C-SIG on Code of Conduct, etc. Such industry-led initiatives helped the European Union to build trust in cloud services and to protect the interest of consumers. The EU Cloud General Assembly was first established with industry members (founding members) in 2017, and the General Assembly published the EU Cloud CoC in April 2019.

c) The Code was developed in collaboration between the European Commission, represented by DG CONNECT, and the cloud computing community, including industry. As per the present regulatory framework, the industry is allowed to develop multiple Code(s) of Conduct as per their requirements except that they have to ensure that the cloud services on the European market comply with EU Regulations regarding data protection. EU CoC is one such code and has submitted to the supervisory authorities for approval. Similarly, recently, the European Commission has taken new industry-led initiatives in the field of cloud services, which includes fair and balanced contractual arrangements, easy data porting, and smooth switching of the cloud service provider, cloud cybersecurity certification scheme, etc. To work on its strategy, various working groups have been established to develop self-regulatory Codes of Conduct, and other documents as per the mandate of such working groups. The proposed Codes of Conduct[14] will function subject to a governance agreement enforced and put into

[13] https://ec.europa.eu/digital-single-market/en/european-cloud-computing-strategy

[14] https://ec.europa.eu/digital-single-market/en/dsm-cloud-stakeholder-working-groups-cloud-switching-and-cloud-security-certification

practice by a new legal entity.

4.3 Earlier initiatives of the DoT to form a body led by the industry

Earlier, DoT has formed Telecommunications Standards Development Society, India, (TSDSI)[15] in reference to standard development space. Before it came into its present form, the Indian Telecom Industry, comprising operators, manufacturers, academia, and R&D organizations, came together to form the Telecommunications Standards Development Society, India (TSDSI) on 7th January 2014. TSDSI is an autonomous, membership-based, standards development organization (SDO) for Telecom/ICT products and services in India. Department of Telecommunications & Ministry of Electronics and Information Technology, and Government of India are jointly supporting TSDSI as India's Telecom/ICT SDO. TSDSI is registered as a not-for-profit society, under the Indian Societies Registration Act XXI of 1860. General Body is the apex decision-making body. The Governing Council steers and governs TSDSI in intervals between General Body meetings. Members of TSDSI form separate Standing Committees for performing its functions. Standing Committees perform their functions through study groups and working groups with members of the body.

4.4 Three steps for the formation of the industry-led body

Since CSPs are spread across sectors and provide different services, it would be better if the Government would initiate the industry body formation and bring them on to a common platform. In view of the above, the Authority chooses to prescribe that, to begin with, the first body should be set up by the DoT under the Society Act as minimum one industry body or industry-led body, which is required for the functioning of light touch regulations as envisaged in TRAI's earlier recommendations on the subject.

[15] https://tsdsi.in/about/

This body may be set up using a three-step process – the first step, Enrollment of CSPs operating in India to provide one common platform; the second step, formation of an *ad hoc* body to frame broad rules and organizational structure to elect regular industry body; and the final step where elected body takes over and starts functioning as a regular industry body and performs functions like publishing and managing Code of Conduct, and monitoring the members to comply with requirements of such Code of Conduct that it adopts, etc.

B. Enroll CSPs providing services in India

4.5 Analysis of CSPs enrollment above threshold

As recommended by TRAI, "All CSPs, above a threshold value, need to become a member of one of the registered industry bodies for cloud services, and accept the code of conduct (CoC) prescribed by such a body. Such a threshold may be based on either volume of business, revenue, number of customers, etc., or a combination of all these. The registered industry body, not-for-profit, may charge a fee from its members, which is fair, reasonable, and non-discriminatory. The threshold value, based on the previous financial year, may be notified by the Government from time to time. In the consultation paper, the issue related to the threshold of value of parameters was raised. Most of the stakeholders submitted that the threshold value of parameters should be left to be determined by the industry. While some stakeholders submitted in their response that the threshold criteria can include the volume of business and revenue of the CSP, and revenue more than 10 lakh per annum could be a criterion. As discussed in the previous chapter that light touch regulatory framework may begin with by setting up the first industry-led body initiated by DoT, as all CSPs would be required to be part of the first body; thus, there is a need to enroll all the CSPs who are providing cloud services in India. For

the purpose of identifying CSPs definition as mentioned in ITU, may be used. It may be noted that Integrated Goods and Services Tax Act, 2017, (the GST Act) also identifies cloud services under 'online information and database access or retrieval services', and organizations would already be filing GST returns for such services.

4.6 Procedure for enrollment

a) For enrollment of CSPs, DoT may make a public announcement on their strategy for initiating the process of developing the framework for the industry body. This enrollment will serve as a means to collect the statistical information for identifying the cloud service providers in the industry, and to form an *ad hoc* body from these enrolled CSPs. In this regard, DoT may issue a public notification for enrollment of CSPs. DoT may develop a live web portal, which will have detailed information on which CSPs can enroll. After issuing the public notification for enrollment of CSPs, DoT may start the CSP enrollment process via an online portal. A timeline may be fixed for this enrollment process, such as six months, from the date of public notification for enrollment. To ensure that genuine CSPs participate in the formation of an industry-led body, a token fee may be charged for enrollment with DoT. In the first three months, the enrollment may be with normal token fee, and, thereafter, it may be allowed with a graded late fee to encourage enrollment within timelines. If CSPs operating in India do not get enrolled within the period specified by DoT, then their operations might get affected. CSPs may be asked to submit information for enrollment such as Company Name/Individual, Proof of registration in India (e.g., GST), Corporate Address/Registered Address, Type of cloud services providing (IaaS, PaaS, SaaS, NaaS, big data as a service, edge computing, etc.), Company Website details, Contact details of authorised person/signatory, who is authorised by CSPs for enrollment, etc.

b) For enrollment, Cloud Service Provider (CSP) may be defined as mentioned in ITU recommendations. Accordingly, "*Cloud Service Provider*[16]*" means a party which makes cloud services available. "Cloud Service*[17]*" means one or more capabilities offered via cloud computing invoked using a defined Interface, where cloud computing means paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand.* Any CSP operating in India may be required to enroll with DoT. For enrollment special provisions may be made, such as CSPs' Association(s) can enroll its members on their behalf, CSPs empaneled with MeitY may get enrollment with DoT automatically, etc. ISPs/TSPs may be asked to inform their customers and suppliers about public notification. *By enrolling with DoT, CSPs have the opportunity to participate in DoT's initiative of formation of the first CSP's industry body.*

4.7 Scope of CSPs Enrollment

End users, both enterprises and individuals, may find different cloud products in the market based on service model or deployment model. Based on the service models, standard service models, Saas, PaaS, and IaaS are the three of the most commonly used terms in the cloud sector. In case of on-premise infrastructure setup, enterprises are required to maintain all the hardware, networking, storage, etc., by itself. The group of cloud services that possess some common set of qualities may be called cloud service category. As discussed in the consultation paper, cloud services can be categorized based on the capabilities offered or functionality provided by a cloud service to the cloud service customer based on resources used.

a) The National Institute of Standards and Technology (NIST) under U.S.

[16] https://www.itu.int/en/publications/Documents/tsb/2020-Cloud-computing-From-paradigm-to-operation/files/downloads/Cloud-computing-20-00081E.pdf

[17] https://www.itu.int/en/publications/Documents/tsb/2020-Cloud-computing-From-paradigm-to-operation/files/downloads/Cloud-computing-20-00081E.pdf

Department Commerce describes three services models in its recommendations[18], as reproduced below:

i. Infrastructure as a service (IaaS): *The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications and possibly limited control of select networking components (e.g., host firewalls).*

ii. Platform as a service (PaaS): *The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.*

iii. Software as a service (SaaS): *The capability provided to the cloud service consumer is to use the cloud service provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through either a thin-client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems,*

[18] Recommendations of the National Institute of Standards and Technology, U.S. Department of Commerce_ https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

b) Nowadays, we can get everything as a service. Cloud providers come up with new services they offer through the cloud[19]. The X in XaaS is an unknown value, meaning "everything as a service". For example, Desktop as a Service, Database as a Service, Network as a Service, runtime as a service, etc. Above discussion shows that cloud services, in general, are categorized based on the capability provided to the consumer, and the level of control configured for the consumer. In the case of IaaS, consumers can enjoy maximum control as it can control operating systems, storage, and deployed applications, and possibly limited control of select networking components. But, in the case of SaaS, consumers may only use the cloud service provider's applications running on a cloud infrastructure with limited user-specific application configuration settings. All the other service models may be categorized and defined based on specific configuration settings, and limitations on consumer control specified by service providers. The definition of underlying cloud infrastructure also changes across spectrum of cloud services based on the consumer control specified by service providers for a specific cloud service. By providing these series of services, Cloud providers may help enterprises to offload its infrastructure maintenance requirement as per their demand. The IaaS is the group of cloud services who manage or control the underlying infrastructure that is basic cloud hardware, but the consumer has control over operating systems, storage, and deployed applications.

c) Cloud users can subscribe to the cloud services from various sources, like directly from CSPs or through channel partners of CSPs. A channel partner is a company that partners with a manufacturer or producer to

[19] https://networklessons.com/cisco/evolving-technologies/cloud-service-models

market and sell the manufacturer's products, services, or technologies. This is usually done through a co-branding relationship. Channel partners may be distributors, vendors, retailers, consultants, systems integrators (SI), technology deployment consultancies, and value-added resellers (VARs), and other such organizations. In the cloud ecosystem, some foreign companies are also providing cloud services in India through various distribution structures. These distribution structures are chosen by entities based on the commercial objectives. The Section 42 of Companies Act 2013 defines "foreign company" as any company or body corporate incorporated outside India, which has a place of business in India whether by itself or through an agent, physically or through electronic mode; and conducts any business activity in India in any other manner. Also, the GST Act 2017[20] defines "supplier" in relation to any goods or services or both, shall mean the person supplying the said goods or services or both and shall include an agent acting as such on behalf of such a supplier in relation to the goods or services or both supplied. Most common distribution structures followed by companies or foreign suppliers in India[21] are:

i. Distributors: Foreign suppliers generally appoint a distributor for entire India, or for a certain defined territory, by way of entering into a detailed distribution agreement. Sometimes, the foreign supplier establishes its own entity to act as importer and master distributor in India, and the master distributor further appoints distributors for different territories in India. The suitability of the distributor model depends upon the level of control the foreign supplier wishes to have on the distribution and sales activities in India. Competition-law-related issues are important

[20] https://www.cbic.gov.in/resources//htdocs-cbec/gst/cgst-act.pdf;jsessionid=F4651E2DBBC26D8A6AEF83341EE315BC

[21] https://www.lexology.com/library/detail.aspx?g=34674772-7d8d-4d50-96fd-de5dd7cd734f

considerations for deciding the distribution structure, such as the fixing of resale price, exclusivity, and territorial restrictions, among others.

ii. Agency: The supplier can appoint agents, wherein the supplier would retain control over the product sale and price. The agent only represents the supplier in India. Further, the supplier would be legally responsible for all the acts done by the agent in the course of business. The agent is generally not implicated in any financial risk, and all the risks associated with the product rest with the supplier. The agent is paid its commission based on sales made. Agents can have varying authority as per the contract entered into between the supplier and the agent.

iii. Franchise: A foreign supplier may adopt a franchise arrangement to distribute its products in India. The said arrangement is generally adopted where sharing of technical know-how and business methods is required. In India, many foreign suppliers have adopted the franchise model to sell their products.

d) As discussed above, the different companies use multiple structures for providing cloud services in India based on their commercial objectives. They provide services through various cloud service partners, including the distributors and resellers, system integrator, cloud hosting service providers, referral partner, consultant, solution providers. The chapter X of the Indian Contract Act 1872[22] defines "agent" as a person employed to do any act for another or to represent another in dealings with third persons, and the person for whom such act is done, or who is so represented, is called the "principal". The GST Act, 2017,[23] defines

[22] http://uputd.gov.in/site/writereaddata/siteContent/indian-contract-act-1872.pdf

[23] https://www.cbic.gov.in/resources//htdocs-cbec/gst/cgst-act.pdf;jsessionid=F4651E2DBBC26D8A6AEF83341EE315BC

"agent" as a person, including a factor, broker, commission agent, arhatia, del credere agent, an auctioneer or any other mercantile agent, by whatever name called, who carries on the business of supply or receipt of goods or services or both on behalf of another, and "principal" as a person on whose behalf an agent carries on the business of supply or receipt of goods or services or both. Thus, the definition of agent under Indian Contract Act 1872 and GST Act 2017 includes various entities like resellers, distributors, etc., of cloud ecosystem, which are distributing cloud services in India, and the foreign companies are also covered under the definition of principal.

e) In view of the above, cloud services may be categorized in various models such as IaaS, PaaS, and SaaS, etc., based on the capability provided to the consumer, and the level of control configured for the consumer. Cloud providers may help enterprises to offload its infrastructure maintenance requirement as per their demand. The IaaS and PaaS are the group of cloud services where management or control of the underlying infrastructure (that is basic cloud computing hardware including operating systems, storage) are left with CSPs, but the consumer has almost full control over the deployed applications. At the initial stage, the industry body may start by onboarding CSPs who engage in providing cloud service of IaaS, PaaS category for understanding the needs of the marketplace, and the code of practice to facilitate customers. The industry body may, however, allow CSPs providing services of other types and categories who voluntarily want to get membership and participate in its proceedings. At a later stage, scope of CSPs may be widened by DoT and the industry body, after reviewing the progress made by the industry body. Thus, the **Authority recommends that the scope of Cloud Service Providers may be initially limited to providers offering Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) in India or to customers in India. Software as a Service (SaaS) providers may voluntarily enroll**

for membership, if they so wish. Any expansion of scope to mandate membership beyond IaaS and PaaS may be considered by the industry body on need basis and recommended to DoT for acceptance.

f) Some of the cloud service providers are providing services in India by adopting multiple structures for distribution of their services. They are providing services through agencies, distributors or resellers. All types of channel partners with different kinds of agreements with the principal company can be covered under the definition of agent under the Indian Contract Act and the GST Act. Therefore, all such channel partners may be required to be on-boarded as members in the industry body to understand the requirements of the cloud industry and provide consumers the relevant information. Membership may be made mandatory for channel partners of CSPs subject to threshold value notified by DoT based on either volume of business, revenue, number of customers, etc., or a combination of all these. However, channel partners may not be required to take membership if their principals are already members of the CSPs' industry body. Thus, **the Authority recommends that the channel partners of various Cloud Service Providers need not be required to take membership of the industry body if their principals are already members. However, they may seek membership independently also, if they so wish.**

g) As discussed in para 3.2 (c), "Telecom Service Providers may be also using cloud infrastructure for their own purposes such as to build and operate their core and radio networks/ functionalities. Functionalities such as Cloud-based Radio Access Networks, Software Defined Networking (SDN), Network Function Virtualization (NFV), Mobile Edge Computing (MEC), etc., are also being introduced by TSPs in their networks. If a CSP intends to provide infrastructure, platform, IMS, Switching, Core Network, NFV, SDN etc. related to Telegraph as defined

in India Telegraph Act, 1885 as amended and Telecommunication Service as defined in TRAI Act, 1997, such CSP may be required to be covered under regulatory/licensing framework. Thus, **in view of the above, the Authority recommends that Telecom Service Providers may not be allowed to share infrastructure and platform related to Telegraph as defined in India Telegraph Act, 1885 as amended and Telecommunication Service as defined in TRAI Act, 1997 with a Cloud Service Provider (CSP) who is not a member of CSPs' industry body registered with DoT.**

C. The precursor of Regular body

4.8 Formation of *ad hoc* body after enrollment

After successful enrollment of the CSPs operating in India, DoT may initiate the process of the formation of an *ad hoc* body from enrolled CSPs. The objective of the formation of an ad hoc body is that it will serve as a skeleton for the regular body. DoT must start the process of formation of the *ad hoc* body in parallel with the enrollment process. DoT may fix the timelines within which the formation of the *ad hoc* body should be completed such as 2 months after completion of the enrollment process. Recently, DoT has released 'National Telecom M2M Roadmap[24]', where it constituted three-layer committees to execute aims of this roadmap, they are, M2M Apex Body, M2M Review Committee and Consultative Committee. These committees have members from industry and the Government such as TEC, DoT, MeitY, etc. DoT may constitute CSPs ad hoc body on similar lines, with members from enrolled CSPs and also government nominees who are working in the areas related to cloud computing.

[24] https://dot.gov.in/relatedlinks/dot-committees-m2m

4.9 Examples of the governance structure of existing bodies

An organisation sets its policies, procedures, values and long-term plans to meet the mission of the organization. The organization does this through a governance structure or model. Few examples of governance structures adopted by industry bodies working in the cloud computing field and other fields, reference to the information published in their websites and information available in the public domain, are highlighted as follows:

a) **Asia Cloud Computing Association (ACCA):** Governance includes board members, executive committee, and secretariat. Chairperson, Vice-chairperson, and treasurer are the part of board members.

b) **EU Cloud CoC:** The Code Governance Bodies, under EU Cloud CoC, is tasked with the implementation and administration of the Code. The Code General Assembly is composed of the founding members and all other members, whose applications to join have been approved by the General Assembly. The Code Steering Board shall be composed of a maximum of 13 (thirteen) members unless a bigger number of members is decided by the General Assembly. The Steering Board, directly or through any sub-committees it chooses to create, monitor changes in European Union data protection laws, and proposes changes to the Code for approval by the General Assembly.

c) **Telecommunications Standards Development Society, India (TSDSI):** TSDSI is also a multi-stakeholder body with members from corporate, academia, research organisations, Indian and foreign associations. General Body is the apex decision-making body. The Governing Council steers and governs TSDSI in intervals between General Body meetings. Members of TSDSI form separate Standing Committees for performing its functions. A list of Standing Committees for different purposes are headed by members of Governing Council. Standing Committees perform their functions through study groups and working groups with members of the body.

d) **Broadcast Audience Research Council (BARC India**): Organizational Structure of BARC India includes equal representation with equal voting rights from the three Associations, namely AAAI, ISA, and IBF. 12 Board members proposed in the Articles of Association of BARC, there shall be two nominees of the Ministry of Information and Broadcasting on the Board of Directors of BARC. Government nominees will not have voting rights on any resolution. There is a secretariat to handle administrative work. Technical Committees may be created with one nominee each from the Ministry of Statistics and Programme Implementation, National Council of Applied Economic Research (NCAER), Indian Statistical Institute (ISI), Kolkata.

4.10 The Authority's view on the governance structure

After analyzing the stakeholders' comments and governance structures as discussed in para 3.8, the Authority is of the view that the industry-led body may have three hierarchical layers. As per the structure adopted by TSDSI, all the members of the industry body may constitute a general assembly where all the regular members would have voting rights. At the *ad hoc* level, the body may also adopt three-tier governance structures such as Governance Council, Steering Committee, and Working groups for specific work of reference. The *ad hoc* body may have a separate Secretariat to perform administrative functions of the industry body. The *ad hoc* body may be chaired by an officer at the level of DDG or above with expertise in cloud services. A timeline of one year may be fixed by DoT for the *ad hoc* body to hand over governance to the elected body. Members nominated for the three-tier governance structure, need to be well conversant with the election processes, rules, regulations, etc. All officials and experts need to be made available by their parent organizations to work on the contributory basis, and without any extra remunerations. From the Government's side, senior officials from DoT and other Departments, having experience or involved in

policy making, drawing specifications, monitoring, and enforcing license conditions may be considered. The *ad hoc* body may suggest types and levels of memberships for the consideration of the regular industry-led body depending upon the profiles of enrolled CSPs.

4.11 Deliverables of *ad hoc* body

DoT may fix some specific terms of reference and mandates for the *ad hoc* body, such as drafting election process and the Memorandum of Association, constitution of a regular self-reliant industry body, with appropriate timelines for completion of work. In this regard, the *ad hoc* body may form working groups with members nominated by the Government, CSPs, or experts in the area. The *ad hoc* body may list out typical deliverables based on the aspects mentioned for the Code of Conduct (CoC) in the earlier recommendations of TRAI, and periodic reports to be published in the public domain and reports to be submitted to DoT on a regular basis. The *ad hoc* body may have members from different fields like government departments, CSPs, and experts in the field of cloud services. In view of CSPs' from different geographical areas, conducting meetings may be challenging for the *ad hoc* body. IT systems may help the *ad hoc* body in maintaining transparency in its working, conducting meetings, creating awareness, and capacity building, where reaching different stakeholders physically may be a bit challenging.

4.12 Election and formation of the first industry body

After framing of the constitution and election processes, the first election of industry-led may be conducted by the ad hoc body. For this purpose, it would require framing relevant rules. This process may involve tasks of developing a detailed document with various processes and criteria involved in the election process such as notifying, filing nomination, eligibility to apply, election procedure, etc.

D. Regular body functions and its governance

4.13 Functions of first elected body

On a similar line of formation of TSDSI mentioned in paragraph 4.3 above, the first industry-led body for cloud service providers may be formed by approving the constitution, and by-laws of the industry body. Once the *ad hoc* body drafts the election process and constitution of the industry body, and elections are conducted, it may hand over the industry body governance to the elected regular body. After successfully getting elected, the elected members of the regular industry-led body would take charge of the office and run functions under the framework set by the *ad hoc* body. Any changes, if required, would need to be in accordance with the procedures laid out by the DoT.

4.14 The governance structure of the regular body

The governance structure of the regular body must be aligned with the recommendations of the *ad hoc* body, and as approved by DoT.

a) It would have the General Assembly, which consists of all the members. The regular body may require officials for the lower hierarchy to manage the operation. Constitution and broad rules developed and drafted by the *ad hoc* body are the broad guiding principles, which may help the regular industry-led body to perform its day-to-day activities and meet long- and short-term objectives. Immediately after the handover of governance, the regular industry-led body may need to do the following after taking the charge, it:

i. Adopt the draft constitution with changes, if any and broad rules for performing its functions and work on its deliverables.

ii. Nominate officials for the lower tiers to manage the operations and carry-out functions.

iii. Estimate the budget to deliver its functions and put up before the General Assembly for approval.

iv. Propose before the General Assembly about the types and levels of memberships based on the suggestions made by the ad hoc body and changes in it, if any, with specific reasons for doing so. It will include fees to be paid by different types and levels of memberships.

v. Propose framework before General Assembly for working procedures and approval mechanism of the proposed work items, and publication of the periodical reports.

vi. to adopt the membership's policy based on recommendations made by the ad hoc body, and in case changes are required over time, it may be required to be recorded with specific reasons for doing so.

vii. The regular body may publish a draft constitution after approval of DoT for comments, to ensure transparency and openness of participation.

b) After successful handover of functionality from *ad hoc* body to regular body, it may require continuous guidance from the Government to avoid deviation from objective of the industry body, to build trust among customers, and all other stakeholders of industry and to ensure stability of regular body. In cloud services, users entrust their important business and personal data to Cloud Providers. Therefore, they are generally concerned about the trustworthiness of their provider and their provider's products and services. The Cloud is about trust, and the proposed industry body may help in building such trust in end users so that they can make informed decisions. Involvement of the Government

representatives in the industry body would help the industry build the required trust among users.

i. In New Zealand, The CloudCode was developed by the New Zealand Cloud Computing industry, facilitated by the IT Professionals NZ. Even in this pure self-regulatory framework, to understand the specific need for a voluntary Code of Practice for Cloud Computing, the Government representatives were involved as observers from the Privacy Commission and Government CIO's office.

ii. In TSDSI, Regulatory Bodies, Government Departments/Bodies including Central/State Government Ministries/ Departments/Institutions, Organisations owned or controlled by Central/State Government, Organisations set up by the statutory/autonomous bodies can become members of TSDSI under corporate membership. Governing Council (GC) elected by the General Body (Apex body) composed of 29 members (maximum), and out of these 29, maxima of 8 members are nominated by the Government. Also, in TSDSI, to alter, extend or abridge aims and objects of the Society, the procedure prescribed in the Societies Registration Act of 1860 shall apply. Sec 12 of the Societies Registration Act 1860, describes the provision to alter, extend, or abridge their purposes as "Governing body may submit the proposition (to alter, extend, or abridge their purpose), to the members of the society in a written or printed report. But no such proposition shall be carried into effect unless such a report shall have been delivered or sent by post to every member of the society ten days previous to the special meeting, nor unless such proposition shall have been agreed to by the votes of three-fifths of the members". Also, Sec 13 of the Societies Registration Act 1980, describes the provision for dissolution of societies and

adjustment of their affairs as, “no society shall be dissolved unless three-fifths of the members shall have expressed a wish for such dissolution by their votes delivered in person, or by proxy, at a general meeting convened for the purpose; provided that whenever any Government is a member of, or a contributor to, or otherwise interested in any society registered under this Act, such society shall not be dissolved without the consent of the Government of the State of registration”.

c) Thus, the Authority is of the view that the apex governing body of the regular body may include nominated members by the Government to build trust among users, to coordinate with the Government bodies, and to ensure that the industry body functions in a fair and non-discriminatory manner.

4.15 Functions of the regular body

Over the time, the industry-led body can perform its regular functions such as developing Code of Conduct (CoC) for cloud service providers in India, other functions and deliverables of the industry body as per the code of conduct and constitution of the industry. DoT may issue guidelines to help the industry body to maintain fair, reasonable, transparent, and non-discriminatory policies, from time to time. There may be a requirement for a review mechanism by DoT to keep a watch on the functioning of the industry-led body and assist it, as and when needed. To assess the challenges of the market, customers, and overall impact of the formation of the first industry-led body, DoT may conduct a detailed review of the regular industry-led body, preferably, after two years. Therefore, immediately after handover and taking the charge, the regular industry body may need to list out all the deliverables for the next 2 years, considering the list of items suggested by the ad hoc body and set timelines for the same.

4.16 Recommendations of the Authority

In view of the above, the Authority recommends that

a) The first industry body may be set up by DoT as a non-profit body under the Societies Registration Act, 1860 in a three-step process.

i. Step I: Enrollment of CSPs operating in India

For enrollment, DoT would make public notification for all CSPs operating in India to get enrolled on DoT's web portal in an online process and submit relevant details about their company or organizations and contact details for further communications.

a. Six-month time should be given for enrollment from the date of public of such notification
b. In the notification, DoT may also inform the consequences for failure to enroll by a CSP and the impact it may have on continuation of their services in India.

ii. Step II: Formation of an adhoc body by the DoT

The adhoc body may be formed by selecting officials from the Government's side and nominating leading experts from the industry's side to steer it.

Enrolled CSPs would automatically become members of the General Assembly of the adhoc body and would be considered for electoral purposes. The adhoc body may be established under the aegis of TEC and DoT on similar lines as done in case of M2M. The purpose of the adhoc body shall be:

a. to draw a Memorandum of Association, broad rules, an initial framework for the regular industry-led body, and

relationship of the regular body with the DoT to take care of the issues related to other stakeholders.

b. to conduct the first election for the formation of a regular industry-led elected body, and for this purpose to frame the relevant rules.

c. to steer it by a combination of the Government and industry experts.

Step II will end with the approval of the initial set of documents by DoT and the election of office bearers.

iii. Step III: Registration of the Society under the Act and taking over of its regular functioning by the elected office bearers.

E. Eligibility, registration fee and period of registration

4.17 Stakeholders view on eligibility, registration fee, the period of registration

As discussed in Chapter 1, issues related to eligibility, registration fee, and period of registration for registration of industry bodies were discussed in the consultation paper. Most of the stakeholders have submitted that the CSPs industry should be not-for-profit, and registered under the section 8 of Companies Act, 2013, or Societies Registration Act, 1860. The vision and mission statement of the industry body should align with the objective of DoT registration. Some stakeholders also suggested documents like proof of registration, Memorandum and Articles of Association or By-laws, CoC, Resolution of the Board of Directors may be submitted in support of their eligibility for registration. Regarding the entry Fee, some stakeholders suggested that it should be low for registered TRAI members or SMEs', and a higher fee for MNCs'. DoT may put a cap on the entry fee for membership to have uniformity. While most of the stakeholders submitted that the membership fee or entry fee for CSPs should be decided by the industry body. One of the stakeholders suggested registration done by industry

bodies can be valid for a longer period, e.g., 20 years as in case of a license for telecom service providers. In OSP registration done by DoT, the period of registration is 20 years initially, and after renewal, it may be extended for 10 years.

4.18 The Authority's view on registration of multiple bodies

To avoid concerns of monopoly, DoT should not give any exclusive rights to one body. Subsequently, DoT may keep a close watch on the functioning and compliance of the body. After reviewing from time to time, if DoT observes that a single body functions unfairly and becomes a monopoly of a few big entities, then DoT may register multiple CSPs industry bodies. At present, for setting up a first industry body for cloud services, there is no requirement to devise a framework for registration of industry bodies.

4.19 The Authority's recommendations on the above discussion

In view of the above, **the Authority recommends that for the first body, which is initiated by DoT, there is no need to define any eligibility criteria or entry fee to be paid to DoT, or period of registration with DoT.** Authority also recommends that **the first body shall not have exclusive rights to perform the functions expected from it. DoT may register other such bodies which may undertake similar functions or part of these functions, as approved by DoT based on its own assessment of need.**

CHAPTER 5
SUMMARY OF RECOMMENDATIONS

A. Light-Touch Regulatory Framework

5.1 The Authority recommends that

a) A registered industry body working in conjunction with DoT/TRAI would enable the stakeholders to discover the right spot in the continuum and reiterates that it does indeed constitute light-touch regulation.

b) DoT may initiate setting up of the first industry-led body and require all CSP's to become its members. This body would lay down broad principles and procedures to aid its functioning.

c) The industry body so created may review its experience and further deliberate upon the need to form multiple bodies for different purposes, such as to address requirements of different market segments. DoT may require this review after two years of commencement of the functioning of the first industry body, or such time as it considers appropriate.

d) The scope of Cloud Service Providers may be initially limited to providers offering Infrastructure as a Service (IaaS) and Platform as a Service (PaaS) in India or to customers in India. Software as a Service (SaaS) providers may voluntarily enroll for membership, if they so wish. Any expansion of scope to mandate membership beyond IaaS and PaaS may be considered by the industry body on need basis and recommended to DoT for acceptance.

e) The channel partners of various Cloud Service Providers need not be required to take membership of the industry body if their principals are

already members. However, they may seek membership independently also, if they so wish.

f) Telecom Service Providers may not be allowed to share infrastructure and platform related to Telegraph as defined in India Telegraph Act, 1885 as amended and Telecommunication Service as defined in TRAI Act, 1997 with a Cloud Service Provider (CSP) who is not a member of CSPs' industry body registered with DoT.

B. Formation of Industry-led Body and its Governance Structure

5.2 The Authority recommends that

a) The first industry body may be set up by DoT as a non-profit body under the Societies Registration Act, 1860 in a three-step process.

i. Step I: Enrollment of CSPs operating in India

For enrollment, DoT would make public notification for all CSPs operating in India to get enrolled on DoT's web portal in an online process and submit relevant details about their company or organizations and contact details for further communications.

a. Six-month time should be given for enrollment from the date of public of such notification.
b. In the notification, DoT may also inform the consequences for failure to enroll by a CSP and the impact it may have on continuation of their services in India.

ii. Step II: Formation of an adhoc body by the DoT

The adhoc body may be formed by selecting officials from the Government's side and nominating leading experts from the industry's side to steer it.

Enrolled CSPs would automatically become members of the

General Assembly of the adhoc body and would be considered for electoral purposes. The adhoc body may be established under the aegis of TEC and DoT on similar lines as done in case of M2M. The purpose of the adhoc body shall be:

a. to draw a Memorandum of Association, broad rules, an initial framework for the regular industry-led body, and relationship of the regular body with the DoT to take care of the issues related to other stakeholders.
b. to conduct the first election for the formation of a regular industry-led elected body, and for this purpose to frame the relevant rules.
c. to steer it by a combination of the Government and industry experts.

Step II will end with the approval of the initial set of documents by DoT and the election of office bearers.

iii. Step III: Registration of the Society under the Act and taking over of its regular functioning by the elected office bearers.

C. Eligibility, Entry Fee and Period of Registration

5.3 The Authority recommends that:

a) For the first body, which is initiated by DoT, there is no need to define any eligibility criteria or entry fee to be paid to DoT, or period of registration with DoT.

b) The first body shall not have exclusive rights to perform the functions expected from it. DoT may register other such bodies which may undertake similar functions or part of these functions, as approved by DoT based on its own assessment of need.

Annexure I (Chapter no. 1/Para no. 1.2)

Government's Decisions on TRAI Recommendations Sent on 16th August 2017

Recomm. No.	Recommendations given by TRAI	Decisions of DoT
A	***Legal and regulatory framework for Cloud Services***	
4.1 (i)	Light-touch regulatory approach may be adopted to regulate cloud services;	Accepted by Govt.
4.1 (iii)	All cloud service providers above a threshold value notified by the Government from time to time in the previous financial year have to become a member of one of the registered industry bodies for cloud services, and accept the code of conduct (CoC) prescribed by such a body. The threshold may be based on either volume of business, revenue, number of customers, etc., or combination of all these. The industry body, not-for-profit, may charge a fee from its members, which is fair, reasonable and non-discriminatory.	Accepted by Govt.
4.1 (iv)	The industry body for cloud services would prescribe the code of conduct of their functioning. Code of conduct shall include provisions as detailed in para 3.10.	Accepted by Govt.
4.1 (v)	No restrictions on the number of such industry bodies may be imposed to ensure that there is freedom in the functioning of such industry bodies, and such a body	Accepted by Govt.

	should not become a monopoly of few big entities.	
4.1 (vi)	DoT may issue directions, from time to time, to such an industry body as and when needed to perform certain functions, and procedures to be followed.	Accepted by Govt.
4.1 (vii)	DoT may also withdraw or cancel the registration of an industry body, in case it finds instances of breach or non-compliance of the directions/orders issued by it, from time to time or non-adherence to code of practices notified by it.	Accepted by Govt.
4.1 (viii)	DoT may keep a close watch on the functioning of an industry body, and investigate the functioning of the body to ensure transparency and fair treatment to all its members.	Accepted by Govt.
4.1 (ix)	A Cloud Service Advisory Group (CSAG) to be created to function as an oversight body to periodically review the progress of Cloud services, and suggest the Government the actions required to be taken. This Advisory Group may consist of: a. Representatives of state IT departments, b. MSME associations, c. Consumer advocacy groups, d. Industry experts and, e. Representatives of Law Enforcement agencies.	In-principle accepted by Govt.

B	***An overarching and comprehensive legal framework for data protection***	
4.2 (i)	The Government may consider to enact an overarching and comprehensive data protection law covering all sectors.	Would be dealt by MeitY.
4.2 (ii)	This data protection framework, inter alia, may incorporate the following: a. Adequate protection to sensitive personal information; b. Adopt globally accepted data protection principles as reiterated by Planning Commission's Report of Group of Experts on Privacy, 2012; c. Provisions governing the cross-border transfer of data;	Would be dealt by MeitY.
C	***Interoperability and Portability***	
4.3 (i)	No regulatory intervention is necessary for interoperability and portability in Cloud services at this stage, these aspects may be left to the market forces. For the time being, however, an industry body should be tasked to promote interoperability in the Cloud Services industry.	Accepted by Govt.
4.3 (ii)	The industry body for Cloud Services should also be mandated to incorporate a disclosure mechanism that promotes transparency regarding interoperability standards followed by the CSPs.	Accepted by Govt.

4.3 (iii)	Telecommunications Standards Development Society, India, (TSDSI) may be tasked with the development of Cloud Services interoperability standards in India.	Accepted by Govt.
D	***Legal framework for CSPs operating in multiple jurisdictions***	
4.4 (i)	To address the issue of access to data, hosted by CSPs in different jurisdictions, by law enforcement agencies: a. Robust MLATs should be drawn up with jurisdictions where CSPs usually host their services, enabling access to data by law enforcement agencies. b. Existing MLATs should be amended to include provisions for lawful interception or access to data on the cloud.	Government considers that the data protection framework should be formulated by MeitY, and it will take care of the issue of access to data. Besides, the Government will further examine/explore the need for MLAT framework once the data protection framework being formulated by MeitY is in place
E	***Cost-benefits analysis***	
4.5 (i)	There is no need to undertake a cost-benefit analysis of cloud services at this stage, as the progress made so far clearly demonstrates the benefits of its use.	Accepted by Govt.
F	***Incentives for conceptualisation and implementation of cloud-based services in India, especially in Government networks***	

4.6 (i)	The Government of India should continue its policy to promote cloud services through cloud infrastructure projects, such as GI Cloud MeghRaj, NIC CC, and National e-Gov AppStore.	Would be dealt by MeitY.
4.6 (ii)	There is no need to give any additional incentive to large customers and CSPs at this stage.	Would be dealt by MeitY.
4.6 (iii)	The Ministry of MSME may continue to promote adoption of ICT in this sector, including the subsidies as being done at present.	Would be dealt by MeitY.

Annexure II (Chapter no. 1/ Para no. 1.3)

DoT's Reference to TRAI for Recommendations

Government of India
Ministry of Communications
Department of Telecommunications
Networks & Technologies (NT) Cell
Sanchar Bhawan, 20, Ashoka Road, New Delhi-110 001

No. 4-4/Cloud Services/2017-NT Dated: 27th September, 2018

To
The Secretary,
Telecom Regulatory Authority of India,
Mahanagar Doorsanchar Bhawan,
Jawaharlal Nehru Marg,
New Delhi-110 002

Sub: Seeking additional recommendations from TRAI on 'Cloud Services'

Kind reference is invited towards D.O. letter no. 305-3/2011-QoS dated 16-08-2017 from TRAI vide which its recommendations on 'Cloud Services' were conveyed to DoT.

2. In this regard, I have been directed to state that above recommendations have been considered by the Government and TRAI recommendation no. 4.1 (ii) regarding framework for registration of CSPs industry bod(y)(ies), which are not for profit, has been accepted by the Government in principle.

3. Accordingly, it has been decided to seek additional recommendations from TRAI on the terms and condition of registration of Industry body, eligibility, entry fee, period of registration, and governance structure etc.

4. TRAI is therefore requested to provide recommendations in accordance with the provisions of Section 11 of TRAI Act 1997, as amended in 2000.

(Rajiv Sinha) 27/9/18
DDG (NT)

Annexure III (Chapter no. 1/Para no. 1.4)

Issues Raised in the Consultation Paper

Q.1. To be registered with DoT, whether there should be a single industry body or multiple industry bodies of cloud service providers? If multiple industry bodies, whether there should be any cap on their number? Should the industry bodies be registered based on the category or type of CSPs? Can a CSP be a member of multiple industry bodies? Provide your suggestion with justification.

Q.2. What should be the eligibility criteria for an industry body of CSPs to register with DoT? What is the list of documents that should be required to be submitted as a proof of eligibility? What obligations should be cast upon the industry body(ies) after registration with DoT? Provide your suggestion with justification.

Q.3. What may be the threshold value of parameters such as the volume of business, revenue, number of customers, etc., or combination of these for a CSP to mandatorily become a member of a registered industry body? Provide your suggestion with justification.

Q.4. Whether entry fee, recurring fee, etc., need to be uniform for all members, or these may be on the basis of type or category of members? How can such a type or category be defined? Should such fees be prescribed by DoT or should be left to be decided by the industry body? Provide your suggestion with justification.

Q.5. What should be the guiding principles for governance by an industry body? How would these principles/organisation structures ensure fair, reasonable, and non-discriminatory functioning of the body? Should the structure of governance be prescribed by DoT, or should it be left

for the industry body to decide? How can the industry body achieve the desired deliverables efficiently and effectively? Provide your suggestion with justification.

Q.6. What policy may be adopted for the initial formation of the industry body for cloud services? Provide your suggestion with justification.

Annexure IV (Chapter no. 3/Para no. 3.7)

CoC Requirements (TRAI Recommendation Dated 16th August 2017)

In previous recommendations, TRAI recommended that the industry-led body for Cloud Services would prescribe the code of conduct of their functioning, which would include the following:

i. **Adopt a constitution** that is fair and non-discriminatory towards its members. The constitution should have provision to adopt the directions, orders, or guidelines issued by the Government from time to time. The constitution should also facilitate the provision of sharing information with the Government or TRAI when asked by them from time to time. It should also facilitate investigation of the conduct of such an industry body by the Government or TRAI to ensure transparency and fair treatment to all its members.

ii. **Membership**: Membership shall be open to any CSPs operating in India, with an equal opportunity without any discrimination. Each member shall be bound to follow the code of conduct prescribed by the industry body. The procedure followed by the industry body, and its various sub-groups while formulating codes of conduct and other guidelines shall be fair, transparent, and non-discriminatory.

iii. **Creation of working groups:** Industry body shall be free to create various working groups to conduct the business including but not limited to for prescribing codes of conduct, to deal with standardisation and technical issues, to deal with consumer grievance redressal, etc.

iv. **Mandatory codes of conduct, standards or guidelines:** Setting out the codes of conduct, current best practices, standards or guidelines formulated

by the industry regulatory body for cloud computing may specifically include the following:

a. **Definitions:** The code should set out definitions of entities and activities that are sought to be regulated. While the Authority endorses the following widely-accepted definition of CC from ISO/IEC 17788:20143, it would be advisable for the industry body to further deliberate upon this issue and develop definitions that are most suitable for the Indian cloud context:

   "Cloud computing: Paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand."

   NOTE – Examples of resources include servers, operating systems, networks, software, applications, and storage equipment. The Authority also endorses the following definition of a CSP laid down by the International Telecommunications Union (ITU) wherein a CSP is defined as a *"party which makes cloud services available" and* "cloud service" has been defined as *"One or more capabilities offered via cloud computing invoked using a defined Interface."*

   ITU also separately defines other CSP-related terms like cloud service broker, cloud service partner, etc. The industry body should consider and adopt relevant definitions for this sector in the Indian scenario.

b. **QoS parameters**: The code should delineate QoS parameters to be complied with by the CSPs for different segments of customers, and publish them on their website. The code should also set out a requirement to publish, on a regular basis, the QoS metrics achieved by CSPs in order to promote transparency in the sector. This should include QoS metrics achieved at the network level, and indifferent customer segments, or deployment models.

c. **Billing models:** The code should lay down various credible billing models that can be followed by member CSPs, and publish them on its website.

d. **Data security:** The code should set out the recommended "reasonable" cloud security standard(s) to be followed by its members, pertaining to issues such as encryption of sensitive data, backup options, and disaster management strategy to protect information held by CSPs from misuse, interference, unauthorised access, and loss. All such standard information should be published on their website for the purpose of transparency. For instance, in Australia, the Office of the Information Commissioner has issued detailed guidance as to what would constitute "reasonable steps" pertaining to data security.

e. **Dispute resolution framework:** The code should set out a model framework for the handling of complaints, including complaints pertaining to billing, metering, and QoS, that should be resolved by CSPs independently. The code may also require CSPs to publish periodic reports on their website of the complaints handled and resolved by them. Procedures may also be prescribed for the handling of those grievances which have not been resolved at the CSPs level.

f. **Model SLA:** The code should also formulate a model template of SLAs, which sets out model clauses pertaining to technical and legal aspects of CC – such as QoS, customer satisfaction, security, data protection, pricing, and action in case of SLA violation – for the protection of the customers. This will ensure that safe and fair terms and conditions of the contract are drawn up by big and small market players alike. For instance, the EC also facilitated an industry group, called C-SIG SLA subgroup, which prepared a set of SLAs standardisation guidelines for CSPs and professional CC-services customers. These guidelines lay down the principles for developing SLA standards for CC services along

with objectives to be achieved through these SLAs in terms of performance, security, and data protection, etc.

g. **Disclosure framework**: The code should set out a disclosure mechanism to promote transparency in Cloud Services. This may include requirements to make disclosures regarding location, migration and outsourcing of cloud data to third parties along with disclosures on security and interoperability. For example, under the New Zealand Cloud Code, a signatory CSP is required to disclose critical details regarding their cloud products and services such as: (i) who has ownership of data (ii) how data security is ensured (iii) where data is located (iv) how data can be accessed and used by customers, etc. The Cloud Code does not impose any legal obligations on the signatories, however, non-compliance with the code can attract liability under the general law.

h. **Compliance to its codes and standards:** Industry body shall monitor adherence to prescribed standards/codes by its members, for which adequate audit mechanisms shall be instituted. The results of the audits shall be displayed on the website of the CSP.

i. **Compliance to guidelines, directions or orders issued by DoT:** Industry body shall ensure compliance by its members to the guidelines, directions, or orders issued, from time to time, by DoT/TRAI.

j. **Information by DoT:** Industry body shall ensure compliance by its members to provide the **requisite information in stipulated timelines as and when sought by DoT/TRAI**.

List of Acronyms

Sl. No.	Acronyms	Full Text
1.	CSP	Cloud Service Provider
2.	AI	Artificial Intelligence
3.	ML	Machine Learning
4.	SaaS	Software as a Service
5.	IaaS	Infrastructure as a Service
6.	PaaS	Platform as a Service
7.	XaaS	Everything as a Service
8.	IoT	Internet of Things
9.	NDCP	National Digital Communications Policy
10.	GDP	Gross domestic product
11.	DoT	Department of Telecommunications
12.	TRAI	Telecom Regulatory Authority of India
13.	CC	Cloud Computing
14.	CoC	Code of Conduct
15.	QoS	Quality of Service
16.	SLA	Service-Level Agreement

17.	CSAG	Cloud Service Advisory Group
18.	OHD	Open House Discussion
19.	SME	Small and Medium-Sized Enterprises
20.	MNC	Multi-National Corporation
21.	SIG	Study Industry Group
22.	MOP	Memorandum of Procedures
23.	MSB	Multi-Stakeholder Body
24.	OSP	Other Service Provider
25.	CSIG	Cloud Security Industry Group
26.	SDN	Software Defined Networking
27.	NFV	Network Function Virtualization
28.	MEC	Mobile Edge Computing
29.	TSP	Telecom Service Provider
30.	VNO	Virtual network Operator
31.	UL	Unified License
32.	CS	Cloud Service

33.	OECD	Organisation for Economic Co-operation and Development
34.	TSDSI	Telecommunications Standards Development Society, India
35.	GST	Goods and Services Tax
36.	CCICI	Cloud Computing Innovation Council of India
37.	MeitY	Ministry of Electronics and Information Technology
38.	ACCA	Asia Cloud Computing Association
39.	EU	European Union
40.	NCAER	National Council of Applied Economic Research
41.	ISI	Indian Statistical Institute
42.	TEC	Telecommunication Engineering Center