



Telecom Regulatory Authority of India



Recommendations

on

**Proliferation of Broadband through Public
Wi-Fi Networks**

(Response to back-reference dated 29th May 2020 received from Department of Telecommunications on recommendations dated 9th March 2017)

05.06.2020

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Chapter – I: Preamble

1. The Authority issued recommendations dated 9th March 2017 to the Government on “Proliferation of Broadband through Public Wi-Fi Networks”. Through these recommendations, an ‘unbundled and distributed model’ for delivery of broadband services through public Wi-Fi Networks was recommended. Being an innovative concept for delivery of broadband services, the Authority successfully undertook a pilot project titled as ‘Public Open Wi-Fi Pilot’. This pilot was conducted with the consent of Department of Telecommunications (DoT). After successful completion of the pilot project, a report on “TRAI Public Open Wi-Fi Pilot” was released. This report was sent to the DoT vide letter dated 22.06.2018. Further, vide TRAI letter dated 4th July 2018, DoT was informed as to how the Wi-Fi Access Network Interface (WANI) framework improves the security of communication and minimizes the risk of intrusion. The back reference dated 29th May 2020 has been received from DoT after a lapse of three years from the date of recommendations of TRAI.

2. These recommendations of the Authority issued on *Suo-motu* basis were necessitated because despite significant progress in the space of mobile broadband, delivering reliable and affordable broadband services in the dense urban areas, inside the buildings, and rural and remote areas remains a challenge. Lack of ubiquitous high speed and reliable broadband connectivity not only adversely affects the Digital India program, a flagship program of the Government, but also reduces the productivity of individuals and enterprises. World over, ‘Wi-Fi hotspots’ are used to fill this gap in cellular coverage. In fact, as per industry reports, in most of the major economies, for 50 to 70 % of their total usage time, mobile users use Wi-Fi technology to communicate. In case of India, this figure is less than 10%. Therefore, there is a dire need to exploit the Wi-Fi technology also for delivering broadband services at affordable prices.

3. In fact, the existing licensing framework does not restrict the Telecom service Providers (TSPs), Internet Service Providers (ISPs), and Virtual Network Operators (VNOs) from deploying the public Wi-Fi hotspots in large numbers to supplement the cellular coverage and improve the quality/availability of wireless internet services in cellular coverage dark areas, however, the same has not happened till now. DoT on 16th October 2018 forwarded a letter of COAI to the Authority which carried a commitment on behalf of TSPs/ ISPs/ VNOs to provide 5 lakh hotspots by 31st March 2019 and 10 lakh hotspots by 30th September 2019. These targets have also not been achieved till now.

4. The back reference dated 29th May 2020 received from DoT is placed at Annexure- I. Before considering the views of DoT on individual issues, it is pertinent to mention here that equating the proposed activities of Public Data Office Aggregator (PDOA) with the activities of existing licensees and burdening it with the resulting obligations, is a misinterpretation of the whole recommendations dated 9th March 2017 and the report on “TRAI Public Open Wi-Fi Pilot”. If the existing licensing framework had been conducive enough to support the growth of Public Wi-Fi hotspots in the country, then we would not have lagged so much in exploitation of Wi-Fi technology for delivery of broadband services.

5. While during the last decade, the proliferation of public Wi-Fi hotspots registered an exponential growth elsewhere in the world, in India we have insignificant number of public Wi-Fi hotspots. For example, in comparison to millions of public Wi-Fi hotspots operating in the USA and European countries, we have less than 0.1 Million public Wi-Fi hotspots only in the country. As per Cisco Annual Internet Report (2018–2023), *“Globally, there will be nearly 628 million public Wi-Fi hotspots by 2023, up from 169 million hotspots in 2018. By 2023, Asia Pacific will have the highest share of global public Wi-Fi*

hotspots at 46 percent. Community hotspots or homespots have emerged as a potentially significant element of the public Wi-Fi landscape. In this model, subscribers allow part of the capacity of their residential gateway to be open to casual use. The homespots may be provided by a broadband or other provider directly or through a partner.

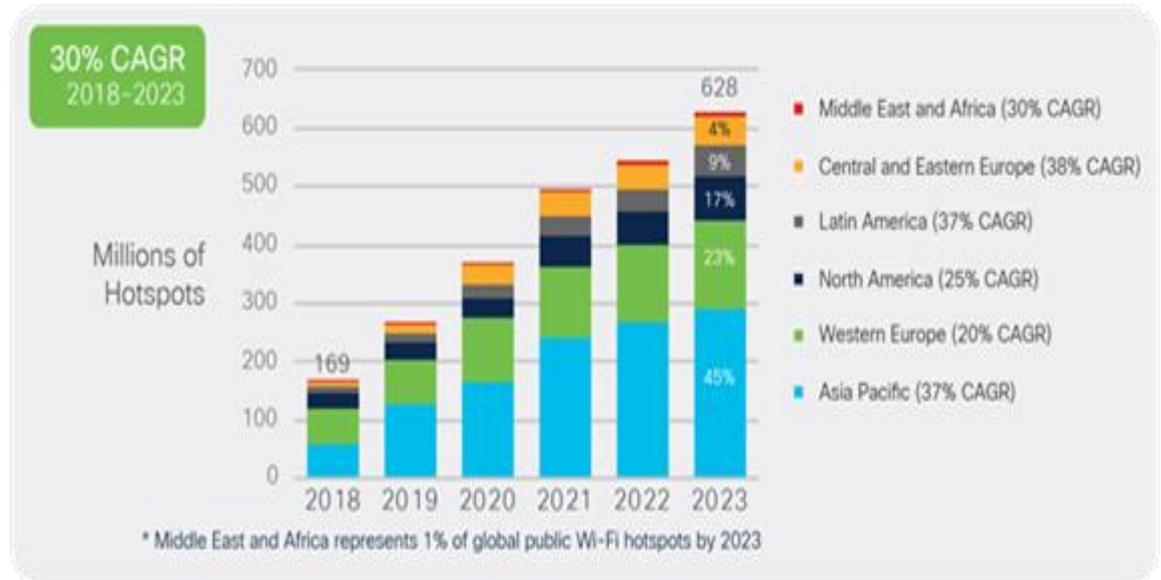


Figure: Global public Wi-Fi hotspots growth by region”

Source: Cisco Annual Internet Report (2018–2023)

In fact, if we go strictly with the above projections and the size of Indian telecom market, having about one sixth of total telecom subscribers in the world, by 2023, at least 100 Million public Wi-Fi hotspots should be there in the country.

6. This appallingly low number of public Wi-Fi hotspots in the country explains why the Authority gave its recommendation, *Suo-motu*, on 9th March 2017. The Authority noted several constrains in provisioning of Wi-Fi Networks and, therefore, issued a Consultation Paper on 13th July 2016 entitled “Proliferation of Broadband through Public Wi-Fi Networks”. On receiving several comments and suggestions from the stake holders, the Authority issued its recommendations. The theme of these recommendations, *inter-alia*, was the following:

- 6.1. Involvement of small entities like *kirana* and *pan* shops to host Wi-Fi Access Points to provide broadband connectivity in areas that are still uncovered from the cellular coverage.
- 6.2. Ease of access of broadband services through Wi-Fi Hotspots, without compromising network security, through electronic KYC and a mix of OTP and Mac ID based authentication system.
- 6.3. Ease of payment through electronic means, as the present system of payment was sachet based and locating the point of sale of sachet was tedious.
- 6.4. Completely unbundled, distributed, and interoperable system so that, using digital technologies and interface, large number of entities can participate in delivering of broadband services.
- 6.5. Easy participation of the stakeholders through light touch registration regime under Indian Telegraph Act, 1885.
- 6.6. Creating a demand for fiber resources (especially of BSNL) and their better utilization and may strengthen wired broadband access points.

7. During the consultations with stakeholders, it emerged that unbundling of various functions i.e. Authentication, Authorization, Accounting, Aggregation, and Service Provisioning and use of digital technology interface for interoperability among them could address the above discussed logistical complexities and improve user experience. Through pilot project, this ‘unbundled and distributed model’ for provisioning of broadband services using Wi-Fi hotspots was successfully tested. The summary of pilot project is placed at Annexure- II.

8. This ‘unbundled and distributed model’ may be new to the telecom service space, but this is the new normal. During the last decade, many service sectors have got transformed using this concept.

In India also, the building blocks for efficiently implementing this model have been developed. These building blocks together are referred as India Stack. India Stack is a set of APIs that allows governments, businesses, startups, and developers to utilize a unique digital Infrastructure to solve India's hard problems towards presence-less, paperless, and cashless service delivery. Two basic elements of India Stack are that its components (Aadhaar, eSign, DigiLocker) provide specific functionalities (in a horizontal manner) and are connected to each other through pre-specified APIs. These individual components are used to develop products/ services. An example of such product is Unified Payment Interface (UPI) which has commoditized the payment system (one of the important functions of banking) and opened the market for various players in the eco-system. UPI connects banks, pre-paid wallet providers, application providers, settlement entity (NPCI), and identity authentication through clearly defined APIs. Thus, the whole payment system has been unbundled among various players without compromising the security of the transactions. It is well accepted that financial transactions require much more robust security than simply accessing the internet. Another example of technology driven service delivery is 'Payments Bank'. The sole objective of the Reserve Bank of India (RBI) to conceptualize the Payments Bank was to widen the access to financial services. RBI aims to grant a secured and technology-driven financial system with Payments Banks. For licensing of 'Payments Bank', instead of issuing licenses to 'Payments Bank' under existing banking license framework, RBI came up with a separate and differentiated licensing framework, which suits to the specific needs of 'Payments Bank'. In similar manner, the whole WANI architecture has been modeled on the India Stack philosophy (creating applications in a layered manner) and UPI model. The WANI framework effectively allows several entities, each performing specific functions in unbundled manner, and creating a grid of Wi-Fi hotspots which are interoperable, and thus using APIs harmoniously producing a service.

9. From the description of the pilot project, it can be seen that 'unbundled and distributed model' piloted by TRAI is completely different than the 'integrated' model, which is presently used by traditional TSPs/ ISPs to deliver internet services. Under the integrated model all functions i.e. Authentication, Authorization, Accounting, Aggregation, and Service Provisioning are performed by single entity. The present licensing framework, whether UL or UL (VNO), has been designed for regulating the service providers operating under integrated model. Regulating different type of entities, i.e. App Provider, PDOA, and Central Registry Agency, to be operated under the new 'unbundled and distributed model', through existing UL or UL (VNO) license terms and conditions would not be feasible as any particular type of entity on its own would not be able to comply with all terms and conditions of UL or UL (VNO). Accordingly, there is a need to develop separate licensing framework in the form of registration specific to each type of entity under 'unbundled and distributed model'. Further, since the scope of different type of entities, to be operated under the new 'unbundled and distributed model', is very restricted in comparison to service providers operating under integrated model, there is no justification in making a comparison or equivalence between them. As a ready reckoner, the comparison of the scope of traditional licensees under the different licenses and PDO/ PDOA is given in Annexure- III.

10. DoT's back reference largely centers around the idea of loading the smaller entities of the WANI architecture with licensing and regulatory obligations, as for the other integrated players/licensees. On the other hand, many hotels, restaurants, airports, and malls are offering Wi-Fi services without any specific licensing/registration. In fact, many such places in India follow MAC ID based authentication, in violation of each time authentication using OTP required as per the

existing instructions, and even then, no spoofing or security issue has come to the notice of the Authority.

11. Against the abovesaid backdrop the individual points of view of DoT are analyzed and TRAI response is given in Chapter – II.

Chapter – II: Para-wise Response

11.1. **DoT View:** The activities of PDOA, as proposed in TRAI recommendations, are similar to the activities of existing licensees and will include acquiring customers through e-KYC, e-CAF, billing of customers, providing internet to the customers, procurement of bandwidth from ISPs/TSPs, creation of last mile connectivity etc. They will also need to capture and provide session details as per requirement of law enforcement agencies.

TRAI Response: As explained in the Preamble, the proposed activities of Public Data Office Aggregator (PDOA) are not at all similar to the activities of existing licensees. In fact, the functions of any PDOA are limited to Authorization, Accounting, and Aggregation and providing usage details as per requirement of law enforcement agencies. Further, the activities relating to KYC and Authentication would be performed by App Provider, in association with the Central Registry, and PDO shall provide the internet services to the customers. The backhaul/ last mile connectivity to Wi-Fi Access Point shall be provided by Licensed Service Providers through Internet Network available in that area. Since, it would be completely prepaid service; the Customer will only be informed about his account balance through the App. Please refer to the Annexure-II for the role of each of the entities envisaged under the WANI framework. As the purpose of the WANI framework is to facilitate the provision of broadband services using ‘unbundled and distributed model’ and exploiting digital technologies such as Apps and Aggregation digital platforms using Wi-Fi technology only, burdening them with exhaustive licensing obligations, which are not relevant under this framework, would kill such innovation and may discourage new entities to provide such facility. Therefore, focus of the DoT should be to safeguard consumers’ interest and growth of

broadband services using alternate technologies while ensuring security and traceability of use of the broadband. In this regard, NDCP-2018 also inter-alia provides that, *“Given the sector’s capital-intensive nature, the Policy aims to attract long-term, high quality and sustainable investments. To serve this objective, the Policy further aims to pursue regulatory reforms to ensure that the regulatory structures and processes remain relevant, transparent, accountable and forward-looking.”*

The Authority, therefore, reiterates its original recommendation that a *“new framework should be put in place”* and *“PDOAs may be allowed to provide Wi-Fi services without obtaining any specific license for the purpose”*. However, as per these recommendations, PDOA would be subject to specific registration requirements. This goes without saying that this registration shall also be under Section 4 of the Indian Telegraph Act, 1885 as the Government has authority under this provision only to permit establishment, maintenance or working of a telegraph by any person within any part of India. [Ref: para 6 & 7 of Summary of Recommendation dated 09th March 2017]

11.2. DoT View: TRAI recommendations have not specifically addressed the issues related to net neutrality, security (requirements of law enforcement agencies), data storage (within India), privacy of the customer data etc. Further, compliance of Indian Telegraph Act 1885 and IT Act 2000 like blocking of websites, facilitating lawful interception etc. if so, required by law will have to be done by the PDOA. All these are possible to be enforced through License Agreements.

TRAI Response: As explained in the Preamble, when PDO is only extending the last mile connectivity to multiple users using Wi-Fi technology and the upstream network management continues to be the

responsibility of licensed TSP/ ISP, the issues relating to net neutrality, blocking of websites, and lawful interception shall not be relevant here. The network management functions relating to net neutrality, blocking of websites, and lawful interception shall continue to be performed by TSP/ ISP providing connectivity to Wi-Fi Access Point of PDO. PDOAs/ PDOs should allow access to any URL in non-discriminatory manner. However, users will not be able to access any URL which is blocked by upstream TSP/ISP. As far as the security requirements of law enforcement agencies, privacy of the customer data and data storage are concerned, these have been referred in the recommendations dated 09th March 2017 and report on “TRAI Public Open Wi-Fi Pilot”. The same need to be made part of the registration terms and conditions.

Therefore, the Authority agrees with the DoT proposal to include the conditions of privacy of the customer data and data storage (within India) in the registration of PDOA, App provider, and Central Registry Agency. PDOA and App Provider should be made responsible for making available the logs relating to customer Authentication, Authorization, and usage of internet to law enforcement agencies.

11.3. DoT View: At present, UL(VNO-ISP) License meets the requirements of PDOAs as enumerated by TRAI and also address the issues as stated in para (i) and para (ii) above.

TRAI Response: As explained in the Preamble, regulating PDOAs through existing Unified License (UL) or UL (VNO) license terms and conditions would not be feasible as it would not be able to comply with many terms and conditions of UL (VNO) as they (PDOAs) do not perform all the functions of such licensees. The existing licensing framework has

been designed for regulating the service providers operating under ‘integrated model’. Since the scope of different type of entities, to be operated under the new ‘unbundled and distributed model’, is quite distinct, existing licensing framework cannot be applied to the latter. If the existing licensing framework is made applicable to the entities envisaged under the WANI framework then it would defeat the whole purpose of an ‘unbundled and distributed model’. The WANI framework has been devised to attract millions of small shop owners and other small establishments to establish Wi-Fi Access Points and new age Startups solving the complex problems using digital technologies. Burdening them with the existing licensing framework, whose scope is much wider, and which is applicable for integrated service providers, would deter them from entering this space and the country may continue to live with meagre number of public Wi-Fi hotspots. Such approach may not enable deployment of 10 million public Wi-Fi hotspots by 2022, as envisaged in the National Digital Communication Policy (NDCP) -2018. Accordingly, there is a need to develop separate licensing framework in the form of registration specific to each type of entity i.e. App provider, PDOA, and Central Registry Agency under WANI framework.

Therefore, the Authority does not agree with the view of DoT that UL(VNO-ISP) License meets the requirements of PDOAs. The UL(VNO-ISP) License does not recognise three separate entities i.e. App provider, PDOA, and Central Registry Agency; and also, does not envisage any interface among Wi-Fi Hotspot, Captive Portal, and Central Registry.

11.4. DoT View: Therefore, Department is of the view that proposed PDOAs should operate under obtain UL(VNO-ISP) License. The one-time entry fee for the license at district level is only Rs. 10,000.

TRAI Response: As explained above, the UL(VNO-ISP) License is not appropriate for PDOA. Asking PDOAs to operate under UL(VNO-ISP) License, which is designed to regulate integrated ISPs, would defeat the whole purpose of this exercise, and kill the innovation at initial stage itself. In this age of digital technologies, when each digital platform is targeting the whole globe as a market, restricting PDOA to District level of operation is not justified. Restricting scope of the PDOA registration to District level would make implementation of WANI framework commercially non-feasible, and cumbersome to execute. Therefore, the scope of PDOA registration should be all over India so that it makes a business case for them and they are able to support PDOs in various parts of the country. For all India registration, the one-time registration fee for a PDOA could be fix at Rs. 10,000.

Under the WANI framework, in addition to PDOA, App Provider and Central Registry Agency are also required to be permitted to perform their functions; and accordingly, the specific registration would also be required for App Provider and Central Registry Agency.

In view of the above, the Authority does not agree with the DoT proposal of granting UL (VNO-ISP) license to PDOA. It is recommended that registrations for PDOA, App Provider and Central Registry Agency should have pan India operations permission. Further, for pan India operations a onetime registration fee of Rs. 10,000/- for App Provider and PDOA is recommended. As far as the Central Registry Agency is concerned, the DoT's proposal to register C-DoT as Central Registry Agency is acceptable.

11.5. DoT View: To facilitate ease of doing business, procedure for granting of UL (ISP)/ UL(VNO-ISP) license can be appropriately simplified. Applications are already made through *Saral Sanchar* portal. Issue of licenses can be in shorter timelines and also suitably delegated (an administrative issue).

TRAI Response: The simplification of procedure for granting of UL (ISP)/ UL(VNO-ISP) license has no relationship with the implementation of WANI framework and registration of entities identified under this framework. However, the Authority agree that the registration procedure for PDOAs and App Providers under section 4 of the Indian Telegraph Act, 1885 should be simple and online. The processes relating to application for registration, submission of self-certified supporting documents, issue of Letter of Intent (LOI), payment of registration fee, and signing of the registration agreement should be digitized.

11.6. DoT View: Ministry of Home Affairs (MHA) had flagged security concerns on proposed MAC and APP based authentication in TRAI recommendations. To address the concerns raised by MHA, the authentication of the subscriber shall be done using mobile based One Time Password (OTP) authentication. All the KYC functions of their customers shall be the responsibility of PDOAs concerned.

TRAI Response: OTP based authentication, before each instance of access, is one of the reasons for poor service experience in the use of public Wi-Fi Hotspots for accessing Internet. Therefore, the Authority has recommended that *“Existing requirement of authentication through OTP for each instance of access may be done away with. Authentication through eKYC, eCAF and other electronic modes be allowed for the purposes of KYC obligations. In consultation with the security agencies,*

DoT may consider authentication by MAC ID of the device or through a mobile APP which stores eKYC data of the subscriber and automatically authenticate the subscriber.” Since it is expected that a large number of public Wi-Fi hotspots would be established in such areas where coverage of the existing cellular networks is non-satisfactory, insisting on OTP based authentication before each instance of access may result in non-receipt of OTP leading to no access to Wi-Fi Hotspot. As mentioned in the Preamble, this is one of the reasons for poor use of meagre number of existing Wi-Fi hotspots at public places.

As far as the concerns of MHA is concerned, kindly refer to the TRAI letter dated 4th July 2018 addressed to Secretary, DoT (Ref: Annexure-IV) on this issue wherein security concerns on proposed MAC and APP based authentication have been addressed. As per the proposed WANI framework, PDOAs as well as App providers would use technology driven digital platforms to perform their functions. One immediate way to address the concerns of MHA could be that App Provider be asked to do periodically the OTP based authentication of each subscriber based on some predefined algorithm. In fact, most of the hotels in India follow MAC ID based authentication in place of each time authentication using OTP, in violation of the existing instructions, and even then, no spoofing or security issue has come to the notice of the Authority. The Authority is of the view that the proposed WANI architecture has an added layer of security as it allows the access to Wi-Fi Access Points through secured user App only. Therefore, the apprehensions of the MHA may not be fully justified.

Further, as per the ‘unbundled and distributed model’ proposed in the WANI framework, the KYC of customers is the responsibility of App Providers. If this responsibility is given to PDOA then a customer would be required to sign-up with multiple PDOAs to access different PDOAs

Wi-Fi hotspots. Again, this will go against the requirement of consumers convenience. This is also one of the reasons that UL (VNO-ISP) license is not suitable for entities to be registered under WANI framework.

Therefore, the Authority maintains its original recommendation about authentication, with suggested implementation, as in Annexure- IV.

11.7. DoT View: Public Data Office (PDO) shall continue to be a non-licensed entity as envisaged in TRAI recommendations. PDO will act as infrastructure provider for installation of Access Points (Wi-Fi Hotspots) for all licensees including PDOA on non-exclusive basis (i.e. One PDO may provide infrastructure support to more than one PDOAs/TSPs/ISPs). PDO may also act as a Point of Sale (PoS).

TRAI Response: To ensure the unified working of the unbundled and distributed system, it is important to ensure that the PDO's Wi-Fi Access Point, PDOA's Captive Portal, App Provider's User App, and Central Registry are compliant to the specifications of WANI architecture, provided in the report on "TRAI Public Open Wi-Fi Pilot". It would ensure that each of them can smoothly interface with each other, as per flow diagrams provided in the said report and deliver broadband services to end consumer in hassle free manner. As per the proposed WANI framework, PDOs shall have commercial agreement with TSP/ ISP for internet connectivity and with PDOA for Aggregation, Authorization and Accounting. A PDO can establish multiple Wi-Fi Access Points and associate them with different PDOAs. The Authority agrees that a PDO would act as Point of Sale (PoS) also.

11.8. DoT View: Only such Wi-Fi Hotspot (Access Point) will be considered as "Public Wi-Fi Hotspot (Access Point)", which are connected to a Central Registry and enable the customer to have facility

of seamless roaming and interoperability in Broadband connection. This shall facilitate customer of PDOA/TSP/ISP to roam and use his/her data pack in any other network connected with Central Registry.

TRAI Response: ‘Public Wi-Fi Hotspot’ is a generic term and it should not be limited to Wi-Fi Hotspots to be established under WANI framework. The Authority recommends that the Wi-Fi Access Point registered in the Central Registry and operating in compliance with WANI architecture may be referred to as ‘WANI Wi-Fi Hotspot’.

Further, here, the meaning of “seamless roaming and interoperability in Broadband connection” and “facilitate customer of PDOA/TSP/ISP to roam and use his/her data pack in any other network connected with Central Registry” is not clear. The WANI architecture is completely unbundled and the ‘WANI Wi-Fi Hotspots’ are interoperable. Any customer authenticated by an App provider can use any ‘WANI Wi-Fi Hotspot’ operated by any PDO/ PDOA for accessing the internet. If any two PDOAs intend to enter into a roaming agreement for permitting each other’s customers to access internet from any Wi-Fi Access Points associated with them, then that is also feasible. Any commercial arrangement amongst PDOAs has nothing to do with interoperability for accessing the internet. Further, presently, WANI architecture does not envisage roaming outside its network. Therefore, the is of the view that, presently, there is no possibility that customer of TSP/ISP would roam and use his/her data pack while accessing WANI Wi-Fi Hotspots.

11.9. **DoT View:** In order to have a level playing field, existing Telecom Access Services Licensees {i.e. Unified Licensees (UL) with Access Service Authorizations, Unified Access Service Licensees (UASL), Cellular Mobile Telephone Service (CMTS) Licensees}, Internet

Service Provider (ISP) Licensees, Unified Licensees with Internet Authorization and Unified Licensees (VNO) with Internet Authorization shall also be eligible to provide “Public Wi-Fi Hotspot (Access Points)”.

TRAI Response: As mentioned in the Preamble, the existing licensing framework does not restrict the TSPs, ISPs, and VNOs from deploying the public Wi-Fi Hotspots. However, these ‘public Wi-Fi Hotspots’ would be quite distinct and different than WANI Wi-Fi Hotspots to be established under the WANI framework. Further, the scope of the existing licenses referred above in the DoT view is much broader in comparison to the scope of the entities envisaged under the WANI framework; and therefore the issue of level playing field between existing licensees and proposed entities does not arise. As a ready reckoner, comparison in the scope of existing licenses and proposed registration under WANI framework is given in Annexure-III.

11.10. **DoT View:** To encourage proliferation and penetration of Broadband through Public Wi-Fi, License fee shall be kept at Re. 1 (One) per annum for revenue earned by providing internet services through Public Wi-Fi Hotspots. The reduced license fee shall be applicable to all Licensees including PDOAs for providing Public Wi-Fi Hotspots. Hence, License fee from the revenue earned by Telecom Licensees (TSPs/ISPs) from Internet Services provided through Public Wi-Fi Hotspots shall also be charged at the rate of Re. 1(Rupee One) per annum.

TRAI Response: The Authority is not in agreement with the above view of DOT.

DOT may refer to the para 3.22 of the recommendations dated 9th March 2017 wherein it is noted that, *“As the entities registered as PDOA need not pay any fees on a revenue share basis, recognition may be given to a separate “commercial” category of tariffs that may be charged by the bandwidth providers for Internet access services provided to commercial customers such as PDO/PDOA. This would balance the incentives between service providers and hotspot providers in the provision of Internet access services through public Wi-Fi networks.”*

The intention underlying the recommendation was that the entities registered as PDOA under WANI framework need not pay any license fee on a revenue share basis. Further, UL, UASL, and ISP licensees (TSP/ISP) would provide the internet connectivity to PDOs/ PDOAs on commercial rates and pay due amount of license fee to the Government on revenue realized from this connectivity. The PDO/ PDOA would deliver broadband services and could levy appropriate charges on the end consumers after adjusting their costs, including payments to upstream service provider, and allowing for a return on investment. It may also be mentioned that, under the current VNO guidelines, the upstream connectivity costs has been permitted as a ‘pass through’ by the Government. The Authority, through its recommendations dated 9th March 2017 on “Proliferation of Broadband Through Public Wi-Fi Networks” had recommended that these registered entities need not pay any fees on revenue share basis.

DoT, as mentioned above, has stated that the License fee shall be charged at the rate of Re. 1(Rupee One) per annum, irrespective of the type of ‘Public Wi-Fi Hotspots’. However, the key issue is that in case of Wi-Fi Hotspots operated under WANI framework, the Government will receive license fee on revenue realized by internet access service provider for

providing internet connectivity to PDO/ PDOA. In case of ‘Public Wi-Fi Hotspots’ operated directly by TSPs/ ISPs, the Government will not receive any license fee, as there would be no separation of revenue earned by TSPs/ ISPs from providing internet connectivity to their own ‘Public Wi-Fi Hotspots’. Therefore the Authority is not in agreement with DoT on their proposal that license fee on the revenue earned by Telecom Licensees (TSPs/ISPs) from Internet Services provided through Public Wi-Fi Hotspots shall also be charged at the rate of Re. 1 (Rupee One) per annum. The intention of the Authority is that entities, registered under the WANI framework, could be encouraged by not having to pay license fees on revenue share basis and by being facilitated by a new enabling framework that would increase availability of affordable internet services.

11.11. **DoT View:** Any other Wi-Fi Hotspot, which is not connected to Central Registry for the purpose of interoperable and seamless roaming, shall not be treated as Public Wi-Fi Hotspots for the purpose of reduced License fee as described in para (x) above.

TRAI Response: On the issue of ‘interoperable and seamless roaming’ and meaning of ‘Public Wi-Fi Hotspots’, kindly refer to the reply given in para 11.8 above. On the issue of license fee, kindly refer to the reply given in para 11.10 above.

11.12. **DoT View:** For seamless and interoperable broadband services through “Public Wi-Fi Hotspots” among licensees including PDOAs, there shall be a Central Registry which shall operate as clearing house among various licensees and shall also control and maintain the requisite Web/APP Portal made exclusively for this purpose. The role of Central Registry is proposed to be assigned to Centre for Development of

Telematics (C-DoT) or a separate license shall be granted for operation of Central Registry, similar to Mobile Number Portability (MNP).

TRAI Response: On the issue of interoperable and seamless roaming, kindly refer to the reply given in para 11.8 above. The function of Central Registry envisaged under the WANI framework is limited to ensuring interoperability among WANI Wi-Fi Hotspots, Captive Portal of PDOA, and User App. It does not envisage any clearing house function among licensees. Further, the authority agrees with the DoT proposal that the responsibility of establishment, operations, and maintenance of Central Registry be given to Centre for Development of Telematics (C-DoT), a central Government Undertaking. In a similar manner, the C-DoT may also be nominated as certifying agency for compliance to WANI architecture requirement and for User Apps of App providers and Captive Portals of PDOAs. Granting these responsibilities through a separate license/ registration to a private entity may not be feasible as there are no selection criteria for deciding a single entity.

11.13. **DoT View:** Terms and conditions of commercial interoperable arrangements among the licensees including PDOAs shall be provided by TRAI.

TRAI Response: Interoperability among Central Registry, Captive Portal and User App shall be ensured by WANI architecture, already developed by TRAI. Certification of Captive Portal and User App by the agency operating the Central Registry will ensure technical interoperability. Roaming between PDOAs is not mandated. Hence, the terms and conditions of commercial agreements among PDOAs who wish to provide roaming services to their customers could be decided between the parties entering into the agreement. In such cases, TRAI/DoT has no role. Further,

all these entities would be authorized under section 4 of the Indian Telegraph Act, 1885, hence, the Authority may decide to intervene on issues relating to Interconnection, Tariff, and Quality of Service, if need arise in future.

11.14. **DoT View:** PDOA may be known as WANI Aggregator and PDO as WANI Provider. The nomenclature will be decided administratively.

TRAI Response: The Authority agrees with this proposal of the DoT.

11.15. **DoT View:** Proposed PDOAs as envisaged by TRAI recommendations shall come under existing Licensing regime.

TRAI Response: As discussed in detail in para 11.1 above, there is a need to develop new framework specific to each type of entity i.e. PDOA, App Provider, and Central Registry under WANI framework. Through separate registration agreements, all of these entities shall be authorized to perform their specific functions under section 4 of the Indian Telegraph Act, 1885.

Hence, in summary, if we intend to achieve the NDCP-2018 objective regarding 10 Million public Wi-Fi hotspots, then we must look at everything afresh from the consumers angle. In fact, NDCP-2018 also emphasizes that, *“Given the sector’s capital-intensive nature, the Policy aims to attract long-term, high quality and sustainable investments. To serve this objective, the Policy further aims to pursue regulatory reforms to ensure that the regulatory structures and processes remain relevant, transparent, accountable and forward-looking.”* For attracting large number of small service providers for operating and maintaining public Wi-Fi hotspots, instead of attempting to apply the existing licensing framework and associated instructions to the new age entities and

technology driven platforms, a forward looking regulatory framework should be finalized at the earliest.

214/c

Government of India
Ministry of Communications
Department of Telecommunications
(Data Services Cell)

File No: DS-16/13/2017-DS-III

Dated: 29.05.2020

To,

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

Subject: Reference back for re-consideration of TRAI Recommendations dated 9th March, 2017 on "Proliferation of Broadband through Public Wi-Fi Networks".

Sir,

With reference to the recommendations of TRAI on "Proliferation of Broadband through Public Wi-Fi" dated 9th March 2017, I am directed to convey as under: -

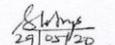
2. The said recommendations have been duly considered by the Department. While broadly accepting to the intent of the said recommendations, the Department is of the view that certain amendments are necessary to address the issues, inter alia, pertaining to security and level playing field. The details are given in Annexure-1.

3. As per the provision of Section 11 of TRAI Act, 1997, a reference back is hereby accordingly made to TRAI for reconsideration of certain recommendations.

4. An early response from TRAI is requested.

Enclosed: As above.

o/c


(S. K. Arya)

Director(DS-III)
(Ph-01123036425)
(email: dirds3-dot@nic.in)

Annexure-1

Reference back for re-consideration of TRAI Recommendations dated 9th March, 2017 on “Proliferation of Broadband through Public Wi-Fi Networks”

1. TRAI Recommendations:

Telecom Regulatory Authority of India (TRAI) had submitted their suo-moto recommendations dated 09.03.2017 on “Proliferation of Broadband through Public Wi-Fi Networks”. The broad features of these recommendations are as under: -

- (a) Internet services through Public Wi-Fi to be provided by an entity known as PDOA.
- (b) PDOA shall be a registered entity only. PDOA shall not take any license from DoT for providing Internet services through Wi-Fi.
- (c) Venue provider for installation of Access Points (Wi-Fi Hotspots) by PDOA to be known as Public Data Office (PDO).
- (d) PDOA not to pay any entry fee and annual license fee to DoT on the revenue earned.
- (e) Know Your Customer (KYC) forms, authentication, authorization and maintenance of customer demographic data to be done by Mobile Application (App) Provider, which is a non-licensed entity.
- (f) Central Registry managed by Department of Telecommunications (DoT)/ Telecom regulatory Authority of India (TRAI) or an entity approved by DoT/TRAI containing information about the PDOs/PDOAs, and App providers.

2. **View of the Department on TRAI recommendations:**

- (i) The activities of PDOA, as proposed in TRAI recommendations, are similar to the activities of existing licensees and will include acquiring customers through e-KYC, e-CAF, billing of customers, providing internet to the customers, procurement of bandwidth from ISPs/TSPs, creation of last mile connectivity etc. They will also need to capture and provide session details as per requirement of law enforcement agencies.
- (ii) TRAI recommendations have not specifically addressed the issues related to net neutrality, security (requirements of law enforcement agencies), data storage (within India), privacy of the customer data etc. Further, compliance of Indian Telegraph Act 1885 and IT Act 2000 like blocking of websites, facilitating lawful interception etc if so required by law will have to be done by the PDOA. All these are possible to be enforced through License Agreements.
- (iii) At present, UL(VNO-ISP) License meets the requirements of PDOAs as enumerated by TRAI and also address the issues as stated in para (i) and para (ii) above.
- (iv) Therefore, Department is of the view that proposed PDOAs should operate under obtain UL(VNO-ISP) License. The one-time entry fee for the license at district level is only Rs. 10,000.
- (v) To facilitate ease of doing business, procedure for granting of UL (ISP)/ UL(VNO-ISP) license can be appropriately simplified. Applications are already made through *Saval Sanchar* portal. Issue of licenses can be in shorter timelines and also suitably delegated (an administrative issue).
- (vi) Ministry of Home Affairs (MHA) had flagged security concerns on proposed MAC and APP based authentication in TRAI

recommendations. To address the concerns raised by MHA, the authentication of the subscriber shall be done using mobile based One Time Password (OTP) authentication. All the KYC functions of their customers shall be the responsibility of PDOAs concerned.

- (vii) Public Data Office (PDO) shall continue to be a non-licensed entity as envisaged in TRAI recommendations. PDO will act as infrastructure provider for installation of Access Points (Wi-Fi Hotspots) for all licensees including PDOA on non-exclusive basis (i.e. One PDO may provide infrastructure support to more than one PDOAs/TSPs/ISPs). PDO may also act as a Point of Sale (PoS).
- (viii) Only such Wi-Fi Hotspot (Access Point) will be considered as "Public Wi-Fi Hotspot (Access Point)", which are connected to a Central Registry and enable the customer to have facility of seamless roaming and interoperability in Broadband connection. This shall facilitate customer of PDOA/TSP/ISP to roam and use his/her data pack in any other network connected with Central Registry.
- (ix) In order to have a level playing field, existing Telecom Access Services Licensees {i.e. Unified Licensees (UL) with Access Service Authorisations, Unified Access Service Licensees (UASL), Cellular Mobile Telephone Service (CMTS) Licensees}, Internet Service Provider (ISP) Licensees, Unified Licensees with Internet Authorisation and Unified Licensees (VNO) with Internet Authorisation shall also be eligible to provide "Public Wi-Fi Hotspot (Access Points)".
- (x) To encourage proliferation and penetration of Broadband through Public Wi-Fi, License fee shall be kept at Re. 1 (One) per annum for revenue earned by providing internet services through Public Wi-Fi Hotspots. The reduced license fee shall be applicable to all Licensees including PDOAs for providing Public Wi-Fi Hotspots. Hence, License fee from the revenue earned by Telecom Licensees

(TSPs/ISPs) from Internet Services provided through Public Wi-Fi Hotspots shall also be charged at the rate of Re. 1(Rupee One) per annum.

- (xi) Any other Wi-Fi Hotspot, which is not connected to Central Registry for the purpose of interoperable and seamless roaming, shall not be treated as Public Wi-Fi Hotspots for the purpose of reduced License fee as described in para (x) above.
- (xii) For seamless and interoperable broadband services through "Public Wi-Fi Hotspots" among licensees including PDOAs, there shall be a Central Registry which shall operate as clearing house among various licensees and shall also control and maintain the requisite Web/APP Portal made exclusively for this purpose. The role of Central Registry is proposed to be assigned to Centre for Development of Telematics (C-DoT) or a separate license shall be granted for operation of Central Registry, similar to Mobile Number Portability (MNP).
- (xiii) Terms and conditions of commercial interoperable arrangements among the licensees including PDOAs shall be provided by TRAI.
- (xiv) PDOA may be known as WANI Aggregator and PDO as WANI Provider. The nomenclature will be decided administratively.
- (xv) Proposed PDOAs as envisaged by TRAI recommendations shall come under existing Licensing regime.

Details about the WANI Pilot Project

Mission:

To establish an Open Architecture based Wi-Fi Access Network Interface (WANI), such that:

- (a) Any entity (company, proprietorship, societies, non-profits, etc.) should easily be able to setup a paid public Wi-Fi Access Point.
- (b) Users should be able to easily discover WANI compliant SSIDs, do one click authentication and payment, and connect one or more devices in single session.
- (c) The experience for a small entrepreneur to purchase, self-register, set-up and operate a PDO must be simple, low-touch and maintenance-free.
- (d) The products available for consumption should begin from “sachet-sized” i.e. low denominations ranging from INR 2 to INR 20, etc.
- (e) Providers (PDO, PDOA, Access Point hardware/software, User authentication and KYC provider, and payment provider) are unbundled to eliminate silos and closed systems. This allows multiple parties in the ecosystem to come together and enable large scale adoption.

Objectives:

- (a) Demonstrate that unbundling of services reduces rework, speeds up development and hence is the most effective way to tackle this complex problem.
- (b) Prove that Multi-provider, inter-operable, collaborative model increases the overall innovation in the system, dismantles monopolies and encourages passing of benefits to end user.

- (c) Test the specifications in real life conditions and suggest improvements.
- (d) Jointly develop a business model that fairly allocates value to each provider.
- (e) Fine tune the technology and finalize the specifications based on pilot.
- (f) Test out integrated payment methods such as coupons (purchased using cash by user or gifted to user), credit/debit cards, net banking, e-wallets, and UPI.

2. As per this ‘unbundled and distributed model’:

2.1. **PDO:** Any Indian entity (companies, associations, small merchants, etc.) having a PAN number wanting to provide one or more WANI compliant Wi-Fi hotspots to public using either free or paid model. In that way, large number of small shop owners (i.e. PDOs) could be tapped for establishing and maintaining Wi-Fi Hotspots and delivery of broadband services to end users. Each PDO shall connect its Wi-Fi Access Router with internet through Fixed Internet Access Network of Licensed Service Providers in that area only. The Licensed Service Providers would declare the tariff in non-discriminatory manner for use of such internet connectivity on commercial basis. Accordingly, under this ‘unbundled and distributed model’, the PDO is responsible for establishing and maintaining Wi-Fi Hotspots and delivery of broadband services only. PDO would be supported by PDO Aggregator and App Provider in performing other functions.

2.2. **PDOA:** PDO Aggregator (PDOA) would perform the functions of Authorization, Accounting, and Aggregation. Accordingly, a PDOA would aggregate multiple WANI enabled Wi-Fi hotspots being operated by individual PDOs and authorize authenticated subscriber to use them for accessing broadband services. PDOA will also declare the tariff and keep account of

usage of each subscriber. Each PDOA will establish and operate a Captive Portal for this purpose. For payment purpose, PDOA shall integrate this Captive Portal with different types of Digital Payment Service providers such as UPI, e-Wallets, Credit and Debit Cards, Online Banking etc. Since, it would be completely prepaid service; the billing function is not envisaged. While PDOA shall maintain the details of usage of individual subscriber at any given point of time, the internet traffic will route directly from Wi-Fi Access Router of PDO to the Network of Licensed Service Provider. As per the recommendations PDOA shall be registered with DoT under section 4 of the Indian Telegraphy Act, 1885.

2.3. **App Provider:** Any company providing a software application and backend authentication infrastructure for users to signup, discover WANI compliant Wi-Fi hotspots, and do single-click connect from within the App. This App allow users to create a profile and do their KYC (mobile verification. This app would allow users to discover WANI compliant hotspots and connect to them. In addition, App Provider would also offer a backend user authentication service that is called by Captive Portal to obtain a signed user profile. Initially, the user App Provider would register each subscriber and authenticate the same using OTP. The App Provider would perform the Authentication function for subscribers and discover the WANI enabled Wi-Fi Access Routers of different PDOs/ PDOAs in the nearby area and provide access to them to subscribers through the App. This would provide the added level of security to the users. Further, the App Provider can authenticate each subscriber periodically based on some predefined algorithm. While addressing the security concerns, it would also ensure that the subscribers are not denied services due to non-receipt of OPT every time.

2.4. All these entities i.e. PDOs, PDOAs, and App Providers shall interact with each other using WANI architecture and their common repository would be maintained in the Central Registry.

2.5. This ‘unbundled and distributed model’, while enabling the separate entities to perform one or more functions independent of each other, through Wi-Fi Access Network Interface (WANI) interface, would also ensure the seamless delivery of service to users.

Annexure- III

Sr. No.	UL(Access services)	UL(VNO) Access Services	UL(Internet Services)	UL(VNO) Internet Services	PDO/ PDOA
1	Establish, operate and maintain Telecommunication Networks and telecommunication services using any technology	Establish, operate and maintain Telecommunication Networks parented to NSO(s) Network and telecommunication services using any technology	Establish, operate and maintain Telecommunication Networks and telecommunication services using any technology	Establish, operate and maintain Telecommunication Networks parented to NSO(s) Network and telecommunication services using any technology	Limited to Wi-Fi access points only
2	1. collection, carriage, transmission and delivery of voice and/or non-voice MESSAGES 2. Internet Telephony, Internet Services including IPTV, Broadband Services and triple play i.e voice, video and data	1. Collection, carriage, transmission and delivery of voice and/or non-voice MESSAGES over Licensee's & or NSO's network 2. Internet Telephony, Internet Services including IPTV, Broadband Services and triple play, i.e. voice, video and data	1. Internet access including IPTV, Internet Telephony through Public Internet 2. Install, operate, and commission International Internet Gateway and sell international internet bandwidth to other licensed ISPs	1. Internet access including IPTV, Internet Telephony through Public Internet	1. Internet access using Wi-Fi technology only
3	leased circuits	leased circuits	Internet Service to any VSAT Service subscriber using lease circuit	Not permitted	Not permitted
4	Voice Mail/Audiotex/Unified Messaging services, Video Conferencing	Voice Mail/Audiotex/ Unified Messaging services, Video Conferencing	Limited Unified Messaging Services	Limited Unified Messaging Services	Not permitted
5	Provide access service using wireline and / or wireless media with full mobility, limited mobility and fixed wireless access	Provide access service using wireline and / or wireless media with full mobility, limited mobility and fixed wireless access	Establish its own transmission links and 'Last Mile' linkages either on fiber optic cable or radio communication or underground copper cable	Establish its own transmission links and 'Last Mile' linkages either on fiber optic cable or radio communication or underground copper cable	Last mile linkages on Wi-Fi technology only
6	Roaming services	Roaming services through NSO	Sharing of "passive" infrastructure	Sharing of "passive" infrastructure	Not permitted



भारतीय दूरसंचार विनियामक प्राधिकरण
TELECOM REGULATORY AUTHORITY OF INDIA
भारत सरकार / Government of India



No. 4-5/2016-BB&PA

Date: 04.07.2018

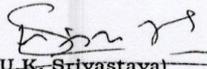
To

Mrs. Aruna Sundararajan
Chairman(TC) and Secretary(T)
Department of Telecom.
20, Ashok Road,
New Delhi-110001.

Sub: TRAI recommendations dated 09.03.2017 on "Proliferation of Broadband through Public Wi-Fi Networks".

Please refer to your letter no. 16/13/2017-DS-III, dated 15.06.2018 seeking views of MHA on the aforementioned recommendations of TRAI.

2. While MAC spoofing is worldwide issue for public Wi-Fi, but WANI (Wi-Fi Access Network Interface) has proposed a solution that minimizes the risk of intrusion. The first and the foremost part is the role of App in providing the security to the user. For an App to be WANI compliant, App provider has to first register itself into Central Registry (presently, managed by TRAI). Since a person has to have a WANI compliant App to sign up on a WANI compliant hotspot, thus this rules out the possibility of an intruder without the registered app to get into the network.
3. As stated in the WANI architecture, the App Provider needs to perform the following tasks:
 - (a) App provider must provide an App to user (for any device/OS based on market needs) and comply with user sign up, profile management, and authentication specifications.
 - (b) App provider must ensure user data is strongly protected to ensure user privacy and data security is ensured.
4. MAC spoofing is not unique to the WANI architecture and exists even today with Phone-OTP based process. The WANI architecture actually goes a step further in reducing the MAC spoofing as connection requests are made by the App itself which is then authenticated by PDOA with the App backend. Thus the proposed solution by TRAI in WANI architecture, of user authentication by App, adds to an extra layer of security to the whole ecosystem.


(I.L.K. Srivastava)
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