TTL RESPONSE TO TRAI CONSULTATION PAPER ON PROLIFERATION OF BROADBAND THROUGH PUBLIC WI-FI NETWORKS

1. Are there any regulatory issues, licensing restrictions, or any other factors which are hampering growth of public Wifi in Country?

TTL COMMENTS

The main factor affecting the growth of public Wi-Fi is the easy availability cost of permissions and cost of infrastructure to build and deploy Wi-Fi networks. Security, safety and power supply are some other issues

The definition and scope of free Wifi by the Center and State Governments are areas which require more clarity and harmonization (Though, the providers can define their own business models, the governments have to provide clear and well defined policies)
The regulation has also some gaps which are dealt with in successive questions

2. Regulatory/policy measures are required to encourage the deployment of commercial models ubiquitous city wide Wifi networks as well as expansion of wifi network in rural or remote area?

TTL COMMENTS

As mentioned above, a major issue in the proliferation of Wi-Fi networks is the availability and cost of infrastructure for deployment. In this respect, Wi-Fi should be given the status of public utility and existing public street infrastructure, buildings etc should be made available. In addition on-ground security to be extended for proliferation of Wi-Fi. Free ROW permissions should be extended where possible at par with public utilities.

TRAI could explore support / subsidy for Wi-Fi rollout on lines of NOFN project and Tax /customs duty benefits. Simplified policies on the authentication processes need further discussions and clarity in consultation with Ministry of Home Affairs though, without compromising the overall security.

Processes like Mobile Connect could be considered, so that customer adoption increases
For a robust Wi-Fi ecosystem to emerge it is very important to have clear understanding on Wi-Fi inter operator agreements and settlement process between different license holders.

These guidelines may be based upon simple and commercially accepted principles and market practices. Wi-Fi as an access is likely to be used for IOT applications that can help subsidize costs for the service providers.

Policies for interconnecting M2M and IOT to Wi-Fi would also help. The ubiquitous nature of service needs more clarity

3. **What measures required to encourage the interoperability between different Wifi network service providers within country or internationally**

   TTL COMMENT

   The following measures may be considered to encourage interoperability between Wi-Fi network service providers:

   - ➢ Standard specification to be defined based on which visited Wifi network should be able to identify the home Wifi network and should authenticate users on standard interface.

   - ➢ Standard identifiers to be defined for each Wifi operator that may help to identify wifi operator

4. **What measures are required to encourage the interoperability between cellular and Wifi networks???**

   TTL COMMENTS

   As discussed in the consultation paper, the basic premise of public Wi-Fi for an operator is to provide a better customer experience to its mobile subscribers. To that effect, the following measures may be useful.

   - ➢ Standard Roaming guidelines like IR 21(in case of Mobility as defined by GSMA) could be worked upon and also further worked upon if required   for offloading the traffic to visited Wifi network from home cellular network

   - ➢ Regulation to be defined for agreement and settlement between cellular and Wi-Fi networks similar to the IRA (in case of Mobility as defined by GSMA).

5. **Apart from frequency bands already recommended TRAI to DOT, are there additional bands which needs to be de-licensed in order to expedite the penetration of broadband using Wifi technology?? Please provide international examples, if any, in support of your answer???**

   TTL COMMENTS

   - • TTL feels that it will help by de-licensing all the Internationally accepted spectrum bands in 5 GHz band for Wi-Fi completely

- Additionally 60 GHZ bands are now being used for short range high speed communications. This band too should be license-exempt and available for WiFI deployments

- Additional bands in the 3GHz are also being explored for free Wi-Fi in various forums around the world.

Also:-

- **WiGig:** A new short-range wireless specification -- using the <u>Institute of Electrical and Electronics Engineers Inc. (IEEE)</u> 802.11ad specification -- that can link devices at up to 7 Gbit/s over a distance of up to 12 meters. That's 10 times faster than the current 802.11n WiFi, though with less range. This makes the technology ideal for wirelessly delivering high-definition video in the home. These devices are expected to grow exponentially in the coming years.
- **Wireless backhaul:** Specifically for small cells, operators can use the 60GHz radios to connect small cells to a fiber hub.
- **Wireless bridges:** Useful for providing extra capacity at events and private high-speed enterprise links.
- **Wireless video:** Some startups have adopted the WiGig standard and have gone ahead with their own 60GHz video connectivity using the Sony-backed WirelessHD standard.
- **Why 60GHz?** A global unlicensed band already exists at 57-64GHz. It is largely uncongested compared to the 2.5GHz and 5GHz public bands currently used for WiFi. Also 60 GHz band boasts a wide spectrum of up to 9GHz that is typically divided into channels of roughly 2GHz each. Significant prospects for the wide-area and short-range use of the technology. Spectrum availability is better than some of the lower-frequency bands. The spectrum is already open and approved for use across many countries such as US, Europe, China, etc.
- Apart from this V Band spectrum, TV White Spaces can also be proposed for unlicensed usage which can facilitate long range connectivity specifically in Rural India (Infact TTL has a running trial going on this spectrum along with IIT, Mumbai in Palghar District in Maharashtra).

6. **Are there any challenges faced in login/authentication to access Wifi hotspots??? In what ways process can be too simplified to provide frictionless access to public Wifi hotspot, for domestic users as well as foreign tourist???**

TTL COMMENTS

While the current method of authentication is simple, supportive regulations to simplify the process would go a long way in increasing the adoption of Wi-Fi in the country.

- There are some alternate login mechanisms like EAP in HS2.0 environment wherein multiple operators can authenticate from their mobile database and user can access wi-fi basis the authentication response. This could result in easy access and local breakout to internet reducing latency.

- Alternate channels for sending the PIN (USSD) to be explored. For example, a GSMA initiative called Mobile Connect uses USSD to authenticate the mobile number and the user.

- Multiple connected devices per user is the norm today. Subscribers carry mobile phone, Tablets and laptops to perform various tasks and require all these devices to be connected to the Internet sometimes simultaneously. However requiring an authentication for every single instance hinders adoption of public Wi-Fi. Simultaneous Multiple Logins for the same username and password could well be carefully considered under security options However, all this should have further interactive consultation on traceability issues for roles and responsibilities

7. **Are there any challenges faced during making payment to access wifi services? Suggest a payment arrangement which will offer frictionless and secured payment for the access to Wifi networks.**

   TTL COMMENTS

   Challenges Faced

   - Currently public Wi-Fi complements the cellular network by providing users a cheaper and better access to the Internet. As a result, the pack denominations tend to be small to cater to a nomadic use. The current two factor authentication for any purchase through any payment instrument leads to dissatisfaction and non-adoption.

   Alternate mechanisms could be:

   - While wallets provide an ideal way to pay for Wi-Fi services, the two factor authentication discourages wide spread usage. No two factor authentication on wallets on pack purchases of less than certain minimum values.

- Given that the mobile number of the customer using the service is stored, the identity of the person in available in case of misuse.

- Access to carrier billing (i.e. ability for the customer to use the balance in their account toward Wi-Fi) is another approach which can address this challenge.

8. **Is there a need to adapt the hub based model along the lines suggested by WBA, where central party AAA will facilitate interconnection, authentication and payments?? Who should own and control the hub? Should the hub operator subject to any regulations to ensure service standard data protection etc???**

   TTL COMMENTS

   Roaming across Wi-Fi hotspots like cellular networks can be done either through a hub-model or bi-lateral agreements. The exact model should be left to market forces and mutual business models. This would benefit the end customers ultimately. Technical considerations in case of a hub operator should include the following:

   ➢ Every Wi-Fi operator has AAA which is integrated to its core network. Enabling multiple integrations on the same AAA exposes the core node to untrusted networks. Hence it is recommended to have a proxy AAA for each wi-fi operator in a DMZ which interacts with the other operator's AAA. This will ensure some levels of security. The guidelines for integration of Hub operators may help and they may have to provide required assurances.

9. **Is there a need for ISP/the proposed hub operator to adopt Unified Payment Interface or other similar payment platform for easy subscription of Wifi access? Who should own and control such payment platform?? Please give full details in support of your answer??**

   TTL COMMENTS

   The payment interface should not be controlled by any one entity. Allowing such a structure would lead to higher prices for the customer. Any payment interface for easy subscription of Wifi access should provide a single touch payment methodology similar to the payment methods followed by the wallet service providers as long some such conditions are met, no special payment platforms would be needed.

10. **Is it feasible to have an architecture where common grid can be created through which any small entity can become data service provider and able to share it's to any consumer or user??**

TTL COMMENTS

This has both pros and cons and need to be weighed. While, technically this is possible provided the prescribed authentication mechanism, however, with many Wi-Fi infrastructures in the same area may have issues. The performance of Wi-Fi degrades exponentially when multiple service providers start radiating their services in the same area.

11. **What regulatory/licensing are required developing such architecture? Is this right time to allow such reselling of data to ensure affordable data tariff to public, ensure ubiquitous presence of Wifi network and allow innovation in the market??**

    TTL COMMENTS

    Data reselling is not allowed under the UASL license. As a result, any licensing should ensure that a level playing field is created for all service providers.

12. **What measures are required to promote hosting of data of community interest at local level to reduce cost of the data to the consumers??**

    TTL COMMENTS

    Cost of data to consumers can be reduced by cross-subsidizing the cost with other revenue streams like Monetization and Content. However to effectively do this, customer profiles are the key. Policies regarding social media logins would be require to be carefully considered in such cases.

    Wi-Fi provides its biggest differentiation when consumers consume data intensive applications like Video, Live TV or time shifted TV. Means may have to found to reduce bandwidth constraints on the backhaul (which will in turn translate to lower costs for consumers),

    Wi-Fi is an access mechanism that can be used by other applications like IOT and M2M. Policies for interconnecting M2M and IOT to Wi-Fi would help. Current security guidelines and policies do not enable such connection.

13. **Any other issue related to matter of consultation??**

    TTL COMMENTS

    The following may be considered:

    - Way forward on Kiosks and RF backhaul based hotspots. Kiosks, both indoor and outdoor, would help exponential increase in public Wi-Fi coverage rapidly.

- Standards Wi-Fi offload through LTE Enode-B.
- LTE over Wi-Fi bands.
- Wireless intrusion prevention and attack mitigation to ensure security of network, non-tampering of data/information and privacy of customer information from unauthorized sources.
- Avoiding broadcast from Access Points which have scanning functionality to prevent misuse.

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