

Cisco Systems India Private Limited response to Consultation Paper on Proliferation of Broadband through Public Wi-Fi Networks

Q1. Are there any regulatory issues, licensing restrictions or other factors that are hampering the growth of public Wi-Fi services in the country?

Backhaul capacity needs to be increased considerably if Wi-Fi is to be expanded. The current backhaul options are on either wired media or 3G/4G which are of limited capacity. Hence more bands need to be provided and additional spectrum bands need to be opened up for Wi-Fi backhaul.

Lower limits on the maximum power that can be radiated from a AP also inhibit the growth, as it becomes commercially unviable to have a AP in low density areas.

More spectrum in the 5 GHz band should be made available for unlicensed Wi-Fi use. Increasing traffic also require wider channels to support higher data rates. There is more spectrum available in the 5 GHz band than in the 2.4 GHz band, enabling more and wider channels to support high data rate applications.

Deployment barriers should also be reviewed. Wi-Fi should be usable under general authorization and not be subject to further restrictions, such as individual town planning permits or diverse technical characteristics for deployment, such as maximum size, power, electromagnetic characteristics or visual impact. It is also important that there are no limits on who can install the access points or requirements to register their locations.

Q2. What regulatory/licensing or policy measures are required to encourage the deployment of commercial models for ubiquitous city-wide Wi-Fi networks as well as expansion of Wi-Fi networks in remote or rural areas?

More bands should be allowed for outdoor Wi-Fi coverage. Further, in areas where the user density is low, the coverage area of a single AP can be the commercially inhibiting factor. Hence, it is suggested that the power limitation on the AP be increased so that a single AP can cover a geographically larger area.

Currently, only 5.825 – 5.875 GHz band is allowed for outdoor deployment, and the spectrum bands 5.150-5.350 GHz and 5.725 – 5.850GHz are not allowed for outdoor deployment. We suggest that all bands should be allowed for outdoor deployments and power limitation of lower two band should also be increased to 4 Watts or 36dBm which is currently upto 23 dBm.

Alongside improving the economic case for deployment in the 5GHz band, this will tremendously help in expanding backhaul to remote rural areas where fiber reach is practically difficult as broadband radio access networks are a viable alternative.

In terms of additional spectrum at 5GHz for license-exempt use, the 5470 – 5725 MHz band has a global footprint and fully developed Wi-Fi equipment ecosystem. The US and EU are also currently looking into making the ‘centre gap’ at 5350 – 5470 MHz and the top band at 5850 – 5925 MHz available, subject to technical studies to develop appropriate mitigation techniques to allow sharing with incumbent users of the bands. WRC-15 mandated studies at 5150 – 5925MHz for future Wi-Fi operational requirements and for coexistence with incumbent services ahead of a possible decision to make spectrum available in WRC-19.

Ideally, a continuous swath of spectrum from 5150 MHz through 5925 MHz will help to alleviate spectrum scarcity and maximize the number of wideband channels available for gigabit-level Wi-Fi.

Q3. What measures are required to encourage interoperability between the Wi-Fi networks of different service providers, both within the country and internationally?

IEEE has amended the IEEE 802.11-2007 standard to add features that improve interworking with external networks. This is standardized as IEEE 802.11u-2011. This standard allows for the discovery of suitable networks (pre-association) through the advertisement of access network type, roaming consortium, and venue information, and also allows devices to move between 3G and Wi-Fi networks by providing a common abstraction that all networks regardless of protocol can use to provide a common authentication experience.

The Wi-Fi Alliance uses IEEE 802.11u in its "Wi-Fi Certified Passpoint" program, also known as "Hotspot 2.0".

Next Generation Hotspot 2.0 play a critical role in offering seamless authentication, provisioning, and roaming. Hence IEEE 802.11u support should be made mandatory requirement for all the Wireless access network to be deployed.

Q4. What measures are required to encourage interoperability between cellular and Wi-Fi networks?

Technology is already available for this by way of ePDG platform as defined in 3GPP. Operators would deploy ePDG to ensure better Wi-Fi coverage, seamless handover between Wi-Fi and mobile data, and a unified billing in addition to data offload to conserve capacity on the licensed spectrum. IEEE 802.11u enabled APs, and ePDG platforms together can provide interoperability between cellular and Wi-Fi networks.

India currently has regulatory rules relating to spectrum sharing and trading by operators, as well as conditions regarding the operation of virtual mobile network operators. These regulatory frameworks should be reviewed to ensure that they are not potential inhibitors to interoperability between cellular and Wi-Fi networks. The regulatory framework should enable hetnets to be deployed by third party providers.

Q5. Apart from frequency bands already recommended by TRAI to DoT, are there additional bands which need to be de-licensed in order to expedite the penetration of broadband using Wi-Fi technology? Please provide international examples, if any, in support of your answer.

TVWS bands are already being explored by TRAI. It is highly recommended that these bands be de-licensed and used for expediting penetration of broadband to support Wi-Fi backhaul. In terms of additional spectrum for Wi-Fi at 5GHz, please see our comments in Q2 above.

Q6. Are there any challenges being faced in the login/authentication procedure for access to Wi-Fi hotspots? In what ways can the process be simplified to provide frictionless access to public Wi-Fi hotspots, for domestic users as well as foreign tourists?

Separate access mechanisms for different hotspots, and non-availability of roaming agreements between different Wi-Fi providers and mobile data operators are major deterrents for users, as users need to have multiple accounts or subscriptions to use pervasive Wi-Fi. It is recommended to mandate the use of IEEE 802.11u so that there can be a seamless user experience with regard to login and authentication across public hotspots.

Q7. Are there any challenges being faced in making payments for access to Wi-Fi hotspots? Please elaborate and suggest a payment arrangement which will offer frictionless and secured payment for the

access of Wi-Fi services.

Having a model using IEEE 802.11u would provide a consistent user experience, and would allow users to have a single account and login, by making a one-time payment that allows usage of multiple hotspots.

Q8. Is there a need to adopt a hub-based model along the lines suggested by the WBA, where a central third party AAA (Authentication, Authorization and Accounting) hub will facilitate interconnection, authentication and payments? Who should own and control the hub? Should the hub operator be subject to any regulations to ensure service standards, data protection, etc?

A hub based model can be adopted to facilitate the interconnection between multiple service providers. An agency on the lines of NIXI can be created that can act as the central hub to authenticate the users of one provider, who want to use the access points of another service provider.

Q9. Is there a need for ISPs/ the proposed hub operator to adopt the Unified Payment Interface (UPI) or other similar payment platforms for easy subscription of Wi-Fi access? Who should own and control such payment platforms? Please give full details in support of your answer.

Since the Wi-Fi users can be users of a service provider (SP) of their choice, it is recommended that the users be allowed to have an account with that service provider. Only in cases where the user has an account with one SP, but is using the services from another SP, would there be a need for interoperability, and accounting reconciliation. This can happen through the use of IEEE 802.11u or the proposed hub operator, that can act as a Unified payment interface across all SPs. This gateway can be operated by the hub operator, who would also have the responsibility of maintain logs for security purposes, and accounting between multiple service providers.

Q10. Is it feasible to have an architecture wherein a common grid can be created through which any small entity can become a data service provider and able to share its available data to any consumer or user?

Such a mode exists in South Korea where small units can become data service providers, and share available data to users. However, this require detailed security architectures to ensure the users are differentiated from the service provider, and can be tracked for legal purposes. This can happen only if the equipment deployed for such use is IEEE 802.11u compliant.

Q11. What regulatory/licensing measures are required to develop such architecture? Is this a right time to allow such reselling of data to ensure affordable data tariff to public, ensure ubiquitous presence of Wi-Fi Network and allow innovation in the market?

It is too early to allow reselling of data with a large number of players. This is because the system architecture for consistent use needs to be tested first for scale, security and user experience with a limited number of service providers and control points. Once the model has matured and the system is stable, it can be expanded to allow data resellers, and SPs also can then have franchises like the PCO model to resell data.

|

Q12. What measures are required to promote hosting of data of community interest at local level to reduce cost of data to the consumers?

Hosting of data of community interest would depend a lot on the usage patterns, and the geographical spread and connectivity between the users of a community. Further, hosting would also need infrastructure like small data centers, that need relatively higher operational skills, and basic infrastructure facilities like power, space, air-conditioning, etc. This might not be possible beyond medium sized PoPs of the service providers. It should be left to the Service providers to decide on the caching and hosting locations based on the business cases, which would reflect in the user experience. The regulator might define high level KPIs to ensure that the service does not deteriorate adversely.

Q13. Any other issue related to the matter of Consultation.

Security of public Wi-Fi networks needs to be addressed and guidelines formulated for each of the models that are being proposed for Wi-Fi penetration.