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Sent: Tuesday, January 11, 2022 9:44:03 PM
Subject: TRAI consultation paper on 5G auction- Mavenir Submission

Kind Attn:

Shri S.T. Abbas,
Advisor (Network,
Spectrum & Licensing),
TRAI,

Good evening Sir,

We are happy to submit a submission on TRAI Consultation Paper on "Auction of Spectrum in frequency bands identified for IMT / 5G" from Mavenir.

We would be obliged if we could be kept marked in any subsequent intimations from TRAI on the subject.

Best regards,
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Mavenir Response to TRAI consultation paper on spectrum Auctions for Private Network

Q.71 Whether some spectrum should be earmarked for localized private captive networks in India? Kindly justify your response:

Mavenir Response:

Many countries have started earmarking spectrum to private networks as of 2021. GSA in its report of September 2021 on 'Private Mobile Network' has identified 55 countries/territories with private network deployments based on LTE or 5G.

As India is going through an Industrial revolution with push to Make in India products, there is a demand arising for Private captive network to serve Industry 4.0 revolution.

Indian Government regulators should earmark some quantum of spectrum in harmonized IMT bands for private captive networks with geographic specific allocation.

Reasons:

- *Secured Network: Spectrum allocation to private companies is completely secured compared to unlicensed band,*
- *Private Companies will have full Control on their own built network with no dependency on any TSP/MNO.*
- *Ease of implementation of any Use Case application in the network.*
- *Assured QoS*

In the United States, the Federal Communications Commission (FCC) recently completed the standardization of the Citizens Broadband Radio Service (CBRS). CBRS is a 150 MHz wide broadcast band at 3.5 GHz. (3550 MHz to 3700 MHz). Similar allocations in EU and other regions are paving the way for 5G adoption for industrial and other private networks. There are three spectrum options available to enterprise/private network operator in the United States namely licensed spectrum, shared or lightly licensed spectrum, and unlicensed spectrum.

Q.72 In case it is decided to earmark some spectrum for localized private captive networks, whether some quantum of spectrum be earmarked (dedicatedly) from the spectrum frequencies earmarked for IMT services and/or spectrum frequencies earmarked for non-IMT services on location-specific basis (which can coexist with cellular-based private captive networks on shared basis)? Kindly justify your response with reasons.

Mavenir Response

In most countries, it has been seen that private network is based on licensed spectrum dedicatedly allocated for private networks.

As these networks will be used mostly for Industry 4.0 applications and used cases which will require a Network with SA mode with ultra-low latency communications.

There are advantages and disadvantages of allocating IMT bands (typically licensed) for private networks. The advantages of operating in MNO licensed spectrum may include ease of mobility in and out of the NPN and may also offer the opportunity for the MNO to extend its public coverage for its subscribers to the area covered by the NPN, subject to business agreements made between the MNO and the NPN operator. In this way, the MNO realizes enhanced in-building coverage at a fraction of the investment required to go alone. Disadvantages of operating in licensed spectrum may include interference between the NPN and the overlaying MNO macro network. This may require careful engineering of the NPN and may also require that the NPN be considered in the MNO's frequency planning and mobility management. There may also be some increased complexity in terms of segregating the NPN traffic and ensuring that the enterprise IT policies and SLAs are met.

Mavenir recommendation is to base the decision of dedicated and non-dedicated IMT spectrum basis the business viability.

Q.73 In case it is decided to earmark some quantum of spectrum for private captive networks, either on exclusive or shared basis, then

a) Spectrum under which band(s) (or frequency range) and quantum of spectrum be earmarked for Private Network in each band? Inputs may be provided considering both dedicated and shared spectrum (between geographically distinct users) scenarios.

Mavenir Response

Spectrum should be dedicated for Private Networks for below two bands

mm Wave: Band n261 – 27.50GHz to 28.35GHz – 850 MHz

n78 : 3.6GHz to 3.7 GHz: 3600 MHz to 3700 MHz -100 MHz

Spectrum proposed for upcoming Spectrum Auction in India:

- 1. mmWave : **24.25 to 28.5 GHz** in all the LSAs except certain portion of this frequency range at 5 locations (n257 (26.5 to 29.5 GHz), n258 (24.25 to 27.50 GHz) and **n261 (27.50 to 28.35 GHz)**)*
- 2. 3300-3670 MHz (N78)*

b) What should be the eligibility conditions for assignment of such spectrum to private entities?

Mavenir Response:

Government Body to review applications based on the below criteria's

- *Strong financial background to build and operate private Network*
- *Strong Business Plan/case*
- *Spectrum Requirement (One location vs Many locations)*

c) What should be the assignment methodology, tenure of assignment and its renewal, roll-out obligations?

Mavenir Response:

Assignment Methodology: It should be first come first serve basis as there will not be any competitive demand among private players for the same geographical areas. Same spectrum band and frequency can be allocated to different companies based on geographies

Rollout Obligation should be 1 year from date for assignment of spectrum.

Tenure Of Assignment: Spectrum will be assigned for a period of 30 Years in line with the decision taken by DOT for upcoming spectrum Auction. Companies will have provision to surrender the license with 6-month Notice period.

d) What should be the pricing mechanism for assignment of spectrum in the band(s) suggested for private entities for 127 localized captive use and what factors should be considered for arriving at valuation of such spectrum?

Mavenir Response:

Fixed one time + Annual license fee payable on each anniversary of the issued spectrum date.

Fixed one time + Annual License fees should be calculated based on the below criteria's

- i. Bandwidth,*
- ii. Size of coverage area,*
- iii. location of coverage*
- iv. duration of total lease of spectrum.*

e) What should be the block size and spectrum cap for different spectrum band(s) suggested in response to point (a) above.

Mavenir Response:

Suggested Band for Private Network

28GHz, Band N261 (27.50 GHz to 28.35 GHz) - Spectrum available 850 MHz; Block Size for Auction: 100 MHz

3.6GHz to 3.7 GHz (3600 MHz to 3700 MHz) – Spectrum available 100 MHz; Block Size for Auction: 50 MHz

f) What should be the broad framework for the process of (i) filing application(s) by enterprise at single location, enterprise at multiple locations, Group of companies. (ii) payment of spectrum charges, (iii) assignment of frequencies, (iv) monitoring of spectrum utilization, (v) timeline for approvals, (vi) Any other

Mavenir Response:

- i. filing application(s) by enterprise at single location, enterprise at multiple locations, Group of companies: Government should allow spectrum based on locations as this will give flexibility to companies to operate. The license should be on the name of local company where the spectrum will be deployed backed by Parent Company.*
- ii. payment of spectrum charges- Should be paid Annually*
- iii. Assignment of frequencies: Frequencies should be allocated based on Geography.*
- iv. Monitoring of spectrum utilization: This should not be applicable as Private Companies will be using the spectrum for their specific used cases and spectrum utilization will not be the right criteria to decide the spectrum utilization. Private Companies would like to buy minimum spectrum to run their network as this requirement is for their captive usage.*
- v. Timeline for approvals: (to be discussed)*

g) Any other suggestion on the related issues may also be made with details. (Kindly justify your response with reasons)