Indian Government enables framework for setting up of captive non-public network by private enterprises

25 July 2021

Partners: *Rahul Matthan and Nikhil Narendran,* ***Counsel:*** *Jishnu Sanyal,* ***Senior Associate:*** *Puja Saha,* ***Associates:*** *Vishal V and Kuruvila M Jacob*

This update covers:

1 Introduction

On 27 June 2022, the Department of Telecommunications (**DoT**) released the guidelines for (i) captive non-public network (**CNPN**) license (**CNPN Guidelines**); and (ii) leasing of spectrum to CNPN licensee (collectively, the **Guidelines**). CNPN means a terrestrial wireless telecommunication network established for captive use within a specified geographical area.

On 27 June 2022, the Department of Telecommunications issued the guidelines for establishing captive non-public networks. This development will complement India's 5G ambitions and enable 'Industry 4.0' use cases.

The Guidelines allow private enterprises to access or set up their own private isolated networks by allowing such enterprise to lease access spectrum from the telecom service providers (**TSPs**) or by obtaining the spectrum directly from the DoT. The CNPN Guidelines provide for a light touch licensing regime as compared to the Unified License[1] (**UL**) regime.

The Guidelines have been issued in line with the Telecom Regulatory Authority of India's (**TRAI**) recommendations dated 11 April 2022 on '*Auction of Spectrum in frequency bands identified for IMT/5G*' (**TRAI Recommendations**). The TRAI Recommendations were issued pursuant to the DoT's request to provide recommendations on the quantum of spectrum band that can be earmarked for private captive/isolated 5G networks.

As per the Guidelines, CNPN could play a significant role in providing secure, reliable, low latency and high throughput communication to enterprises, especially for emerging technologies such as Long Range (**LoRa**) and machine to machine (**M2M**). LoRa is a long range, low power, wireless communications technology used for internet of things (**IoT**) and M2M applications. M2M communication enables devices in a network or

[1] The license agreement entered between the telecommunication service providers and the DoT.

machines to exchange information and perform functions without or with minimal human intervention. M2M communication offers use cases across various industry verticals, e.g., smart devices such as wearable health devices, self-driving cars and smart electric metering.

2 Framework for setting up CNPN

The Guidelines provide the framework for TSPs and enterprises for setting up CNPNs. There are four different methods of setting up a CNPN:

a. TSPs with an access service authorisation under the UL or Unified Access Service License (**UASL**) can provide private isolated network as a service to enterprises using their network resources over their public land mobile network (**PLMN**), through methods such as network slicing, etc.

b. TSPs with an access service authorisation under the UL or UASL can also establish private isolated networks for enterprises using the international mobile telecommunications (**IMT**) spectrum acquired by them.

c. Enterprises may obtain spectrum on lease from TSPs and establish their own private isolated networks that are not connected with public networks.

d. Enterprises may obtain spectrum directly from the DoT and establish their own private isolated networks.

There is no such requirement to obtain a license in case an enterprise seeks to obtain the services of a TSP as under (a) and (b). However, in case an enterprise seeks to set up its own private isolated networks, as provided in (c) and (d), it must obtain the CNPN license from the DoT as per the procedure provided in the Guidelines. Some of the key features of the Guidelines are highlighted below:

Particulars	Description
Eligibility criteria	Minimum net worth of INR 100 crores for direct assignment of spectrum.
Scope of the license	a. To establish an indoor or within-premise private isolated network for its use within the area of operation of license. b. A single CNPN license is required for operations at multiple locations. c. CNPN cannot be used for providing commercial telecommunication services.
Validity	10 years
Interconnectivity	CNPN licensee cannot connect its own private isolated network with public network such as public switched telephone network (**PSTN**), PMLN, global mobile personal communication by satellite (**GMPCS**) and internet, in any manner.
Security conditions	CNPN licensee must: a. Deploy network elements as per the Telecommunication Engineering Centre standards, wherever mandatory. b. Follow the relevant network security conditions regarding procurement of telecom equipment as issued by the Government. The DoT will have the right to inspect the CNPN, lawfully intercept and ascertain its *bona fide* use.
Spectrum leasing from TSPs	CNPN licensees: a. Can obtain IMT spectrum on lease from more than one TSP with access service authorisation, on mutually agreed terms. b. Must obtain spectrum for each individual geographical area/location separately.
Direct assignment of spectrum	CNPN licensee can also obtain spectrum directly from the DoT. DoT will conduct a demand study and seek TRAI recommendations before directly assigning spectrum for captive use.
Other conditions	Obtain Standing Advisory Committee on Radio Frequency Allocation (**SACFA**) clearance and other conditions such as those in relation to interception, frequency emission, will also be imposed.

3 Opportunities

3.1 Deploy customised use cases through network slicing

The Guidelines offer enterprises and the TSPs an opportunity to deploy customized use cases within specified geography over the same underlying network infrastructure. The TSPs are allowed to provide a private isolated network as a service by using network resources (such as network slicing) over its PLMN network.

Network slicing allows running multiple logical customised networks on a shared common infrastructure. A slice of the network can be managed by the TSP to provide services to the public, while another slice can be used to provide customised enterprise solutions over the same infrastructure. TSPs can therefore leverage the same infrastructure and make use of network slicing capabilities to provide the private isolated network services in conjunction with the public network. This will improve productivity, efficiency, cost optimisation, safety and security.

This could be used in airports, ports, railway stations, data centres, stadia, hospitals and other public and private infrastructures to deliver dedicated non-telecom services. CNPN could also be used to provide edge-caching for media and high latency applications.

Several global players such as NTT (Japan), Comcast (US) and BT Group (UK) are offering/planning to offer 5G CNPN as a service to enterprises.

3.2 Spectrum leasing on mutually agreed terms

In line with global practices, the Guidelines enable enterprises desirous of establishing a private isolated network to lease IMT spectrum from a TSP. A CNPN licensee is permitted to lease spectrum from multiple TSPs for the specific location.

The Guidelines do not provide for any stringent criteria (such as minimum rollout obligations, charges for leasing, compliance obligations) for availing the spectrum and the commercials can be mutually decided between the TSPs and the enterprises. There are several bands which are either not utilised or under-utilised by the TSP. Hence, allowing enterprise spectrum leasing provides an opportunity to the TSPs to recoup their infrastructure investments and monetise these spectrums, as an additional revenue stream.

3.3 Option to avail spectrum directly from the DoT

Enterprises meeting the net worth criteria of INR 100 crore can directly obtain spectrum from the DoT. This provides another opportunity to enterprises to set up their own private isolated networks in remote areas where TSP networks may not be available. Further, in this model, the whole network will be deployed on the premise as a standalone CNPN. Any interconnection with the public network will have to be carried out by the TSPs. Additionally, if enterprises set up their own private isolated network, partnering with a TSP will ensure service continuity when roaming outside the private isolated network area and support high bandwidth services in wide area deployment. Thereby, the TSP's interest is sufficiently protected in providing enterprise solutions.

The TRAI Recommendations noted that earmarking spectrum in globally harmonised bands for localised private isolated network is a key requirement for some of the industries, particularly in cases of manufacturing and other verticals where connectivity is highly critical. The DoT has not earmarked spectrum for private isolated network and is yet to conduct the demand study for direct spectrum assignment. Basis the demand study, the TRAI will issue recommendations on earmarking spectrum on IMT or non-IMT bands for private isolated networks along with the process and conditions for obtaining spectrum directly from the DoT.

Accordingly, an enterprise may set up CNPN using the spectrum bands that will be earmarked by the DoT for CNPN.

3.4 Enhanced security and control by enterprises

An enterprise using CNPN (over public networks) can benefit from enhanced data security, greater control over management of connectivity, network performance and security of the network, optimised quality of service, reliability and a secure means of communication within a specific area. This can help enterprises transform operations, increase automation and efficiency, or implement new products or services.

The incidence of data breaches, hacking and other cybercrime is increasingly common due to the increased global dependency on the public internet. Private networks can help organisations insulate their key information and communications, therefore increasing safety for the organisation as well as its customers. In the event of using services like AWS, Cloudfare, etc., private networks can deploy their own security instructions to manage such interactions.

3.5 Better network optimisation and use cases for enterprises

5G CNPN is likely to act as a catalyst for *'Industry 4.0'* use cases. In comparison to connectivity over unlicensed spectrum, enterprises deploying a 5G enabled CNPN will benefit from superior performance including better quality of service, higher bandwidth and throughput, mobility, reliability, lower latency and greater density of devices. Given these attributes, 5G enabled private network solution and the ability to lease spectrum enables enhanced enterprise-controlled content delivery network (CDN) services. This in turn will decongest the existing access networks and provide a way for better traffic management.

5G CNPN can provide improved capabilities enabling new use cases and significantly augment others, such as autonomous mobile robots, augmented reality, virtual reality, wireless robots, LoRa, M2M, IoT, drone or UAV inspections, software driven controls, remote location monitoring and control, ease in detection and resolution of issues and lower operational costs. For instance, for factories or assembly units, private networks can be connected to IoT devices for better monitoring, automation and security. In hospitals, dedicated network layers can be used for patient health monitoring and for IoT related health devices. They can also be deployed in a variety of public locations such as railway stations or airports to offer on demand, high speed and high security connectivity.

Most *'Industry 4.0'* use cases as well as CDNs require ultra-fast and reliable connectivity, which is critical for real-time decision making. Therefore, 5G CNPN can be a boost to the operations, products or services of enterprises, given the quality of service enabled through a private 5G network.

3.6 Leverages existing infrastructure

5G networks are known to be more expensive to deploy as it requires multiple small cells for effective utilisation. With CNPN, TSPs will now be able to leverage the same infrastructure for providing both private and public networks. This could result in new revenue opportunities for the TSPs arising from the same infrastructure.

With the advent of 5G, there will be a requirement to deploy low power base stations with 5G radios often called '*small cells*' due to network elements working on higher frequency spectrum bands, but with limited coverage. Small cells enable the features of 5G to be exploited fully and hence, deployment of small cells (on street lights, electricity poles, traffic lights, bus shelters, perimeter of offices, etc.) will play a critical role in the success of 5G. If private CNPNs are also allowed to share small cells with TSPs, this will further reduce the number of small cells required for 5G rollout and will result in optimal and greener 5G networks.

4 Looking Ahead

In the years to come, it is expected that most companies will likely deploy 5G in combination with existing connectivity, including wired ethernet networks. Given the global momentum towards adoption and deployment of private 5G networks, the Guidelines are a step forward, striking an adequate balance between TSPs and enterprises.

The Guidelines provide flexibility to enterprises by allowing them to either partner with the TSPs to set up CNPN or set up their own private isolated networks by leasing spectrum from the TSP or even directly from the DoT, subject to the Guidelines. The Guidelines have liberalised the regime for spectrum leasing allowing private entity to set up its infrastructure and are also light touch in their approach. While the provisions relating to earmarking of spectrum, process of allocation of spectrum and conditions are yet to be addressed by the DoT, the Guidelines will bolster India's position in the international market. This will also vastly contribute to the economy and the gross domestic product of India.