

Public Consultation on 5G Mobile Services

Introduction

In a bid to encourage the industry to explore the potential benefits and test the capabilities of the upcoming fifth generation of mobile technology, the Singapore Government announced on 23 May 2017 that it has waived the frequency fees for 5G trials until 31 December 2019.

On the same day, the Info-Communications Media Development Authority of Singapore (“**IMDA**”) launched a public consultation on 5G Mobile Services and Networks to seek feedback on the various aspects of 5G technology development and spectrum requirements in a data centric environment. The public consultation ends at 12 noon of 7 July 2017.

Developments in 5G

The demand for enhanced mobile broadband experience has led to an increasing focus on 5G. Seen as a comprehensive wireless-access solution with capacity to address the demand and requirements of mobile communication beyond 2020, it is projected that 5G will operate in a highly heterogeneous environment and provide global connectivity for a wide range of devices, new applications and use cases. 5G is envisioned to be used for the provision of, amongst others, enhanced mobile broadband, Machine-to-Machine communications as well as ultra-reliable and low-latency communications. Although still in its infancy, 5G services promise more bandwidth and lower latency for new services that are not possible with 4G today.

Commercial and regulatory activities have begun preparations for 5G technology. These include launching field trials and working on 5G technical standards, the latest of which was that published by the International Telecommunication Union (“**ITU**”) for International Mobile Telecommunication (“**IMT**”) beyond 2020 (“**IMT-2020**”).

5G is anticipated to be introduced on or after 2020. A variety of trials are already being undertaken by telcos worldwide, including Singapore.

Issues for Public Consultation

Through its public consultation, IMDA aims to gather views and comments from stakeholders to be able to develop the necessary policies to facilitate the deployment of innovative and advanced mobile technology, networks and services in Singapore.

Some of the areas discussed in the public consultation are as follows:

Capabilities of 5G Technology

IMDA has identified the capabilities of 5G technology that will bring about the vision of a unified mobile network that integrates in a seamless manner various existing technologies and heterogeneous platforms.

(i) Multiple-Input Multiple-Output (“**MIMO**”)

MIMO technology is considered to be an important element of 5G. MIMO is an antenna technology in which multiple antennas are used at both the transmitter and receiver. It provides the potential for incremental performance improvement over single input single output (“**SISO**”) communications systems.

(ii) Software-Defined Networking / Network Functional Virtualisation and Network Slicing

Software-Defined Networking (“**SDN**”) defines elements of network processing in software rather than hardware. SDN concepts were developed further in the telecommunications industry, leading to the definition of Network Functional Virtualisation (“**NFV**”) technology. NFV facilitates faster configuration for service innovation because it allows closer integration of commercial service design and network configuration functions. Through SDN and NFV, it is possible to configure the network architectures dynamically depending on the service or use case. This “network slicing” is also considered to be a key feature of 5G.

IMDA is seeking feedback on what the industry considers will be the key technologies for 5G and whether existing regulatory frameworks sufficiently facilitates the deployment of these technologies.

Spectrum Requirements to Deploy 5G Services

One of the requirements to deploy 5G services is the use of spectrum bands above 6 GHz, also referred to as millimeter wave (“**mmWave**”) bands. While frequency bands above 20 GHz have been specifically identified as being used for 5G, there is currently no consensus on the specific amount of spectrum that might be required in these bands. However, the majority of industry trials in the mmWave band for 5G, including those in Singapore, have taken place at the 28 GHz.

On this front, IMDA is seeking feedback on the amount of spectrum required in the mmWave spectrum bands to meet 5G applications in Singapore.

Use of Licence-exempt Spectrum for IMT Services

With the increased demand for mobile connectivity, Mobile Network Operators (“**MNOs**”) and consumers have been offloading data using unlicensed band through the use of Wi-Fi. As such, Wi-Fi and cellular have been considered as complementary technologies, and both are now being integrated on the same devices and operating seamlessly. It is reported that there has been a significant increase in Wi-Fi hotspots across Singapore, which implies heavy and growing reliance on Wi-Fi technology and licence-exempt spectrum for wireless communications. On the other hand, Long Term Evolution (“**LTE**”) networks have been deployed using licensed spectrum using specific bands. As the amount of mobile traffic increases, there have been efforts to promote carrier aggregation of licensed and licence-exempt spectrum. 5G technology may use licence-exempt spectrum through Licensed Assisted Access (“**LAA**”) and LTE-Unlicensed (“**LTE-U**”) approach, whereby LTE is deployed in the licensed spectrum, while utilising the licence-exempt bands to improve data rates.

IMDA intends to seek feedback on the adoption of listen-before-talk (“**LBT**”) protocol, which is utilised by LAA, to facilitate sharing of licence-exempt spectrum in an efficient and fair manner. Under the LBT set-up, radio transmitters are required to first sense their radio environment before they start transmission. This will address concerns from industry players that the proprietary method used by LTE-U, Carrier Sensing Adaptive Transmission (“**CSAT**”), may not facilitate fair co-existence with Wi-Fi users.

In connection with the above, the questions that the IMDA has raised for public feedback in the public consultation document include:

- Besides ensuring that spectrum is made available in a timely manner, what other regulatory measures could assist in facilitating the deployment of 5G technology and applications?
- What will be the key technologies for 5G and do current regulatory frameworks sufficiently facilitate the deployment of such technologies?
- Is there a need for further spectrum below 1 GHz to be identified and released for mobile services?
- Are there other frequency bands in the 1-6 GHz frequency band that IMDA should consider for IMT / 5G?
- If the 28 GHz band is opened for IMT services in Singapore, would there be any future competing services that may be deployed in this band which may cause interference issues?
- Considering the current regulations/policies for licence-exempt use and the possibility of LTE-U interfering with Wi-Fi users, is there a need for further technical requirements and regulatory measures to facilitate the sharing of licence-exempt spectrum in an efficient and fair manner?

Our Comments

The development and commercialisation of 5G will represent the next big leap in mobile technology and spawn a host of mobile applications and uses that are not possible today.

Within Singapore, as in the rest of the world, the availability of spectrum for 5G, as well as how it is to be managed and allocated to mobile players, is going to be critical.

The waiver of frequency fees for 5G trials, as well as public consultation issued by the IMDA are encouraging indicators that the Singapore Government is keen to work together with the industry to put in a place a conducive regulatory and testbedding environment for the development of 5G in Singapore.

In particular, the public consultation presents a valuable opportunity for stakeholders to engage the IMDA on its proposed approaches for the introduction of the next generation of mobile services in Singapore, and to shape the relevant regulatory and spectrum framework at this early stage.

Should you wish to take part in the consultation exercise, do let us know and we will be happy to discuss this further with you.

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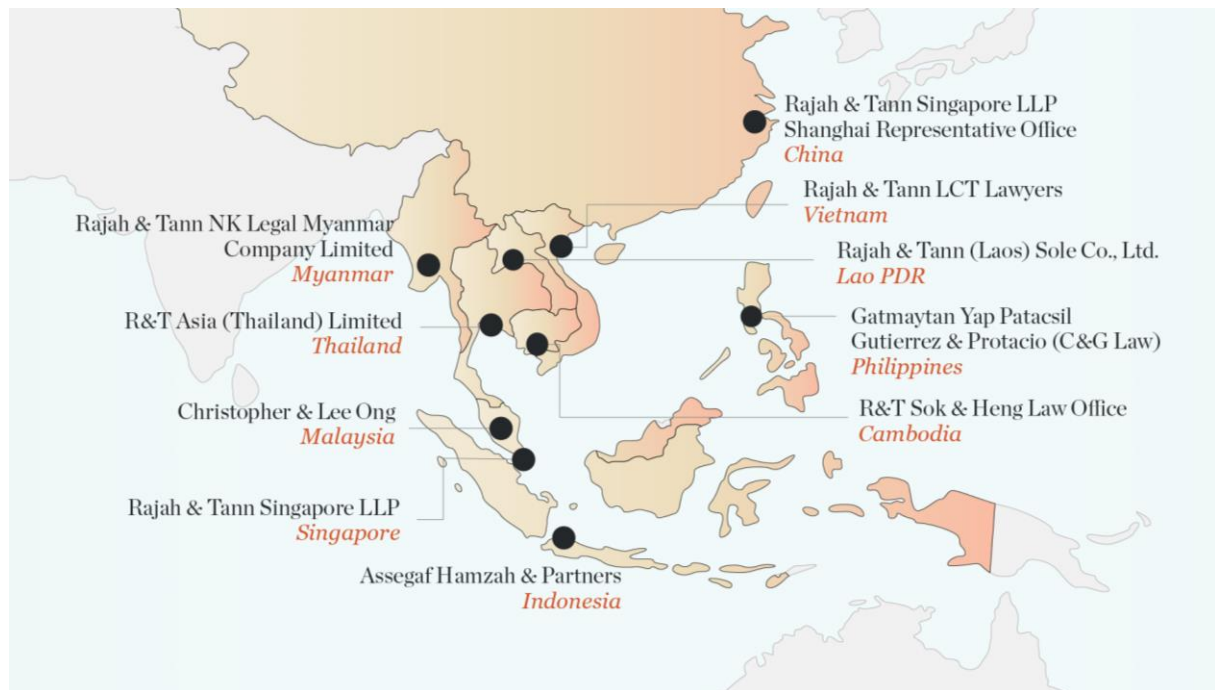
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Client Update: Singapore

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