ANNEX B

April 2015

FACTSHEET

HetNet Trials

Background

Singapore is striding towards becoming the world's leading Smart Nation, one that will improve the quality of life for individuals and business productivity of enterprises by tapping on the potential of infocomm and media (ICM). A key requisite to achieve this vision is the new Smart Nation Platform (SNP), which is built around four focus areas – Connect, Collect, Comprehend, and Create

The underlying communications backbone (Connect) is an essential component of SNP and must first be in place to support the collection of data for Smart Nation. IDA aims to build a pervasive and robust communications infrastructure through the Heterogeneous Network (HetNet) Programme. This was initiated under the Infocomm Media Masterplan to support Smart Nation with the vision of enabling connectivity for "Everyone, Everything, Everywhere, All the time" (E3A). HetNet is also expected to maximise the utilisation of the frequency spectrum by allowing devices to switch seamlessly and intelligently between different types of wireless networks such as cellular and Wi-Fi networks, while according them the appropriate Quality of Service (QoS) to serve their usage scenarios.

About HetNet

An initial assessment by IDA forecasts the mobile data traffic in Singapore to grow exponentially from approximately 3.1 petabytes per month in 2010 to approximately 37 petabytes per month in 2015, representing a compound annual growth rate of 64%. IDA is exploring HetNet as a strategy to mitigate the potential crunch in wireless spectrum usage, available traffic capacity, and the provision of seamless connectivity everytime and everywhere, indoors and outdoors. The key benefits of HetNet are as follows:

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Efficient and Pervasive Coverage

The use of small cells[1] and Wi-Fi is particularly crucial to provide additional capacity to indoor environments where a majority of broadband data traffic occurs. They can also be used to boost coverage and capacity at key locations where macro coverage is weak. One of the key characteristics of HetNet is to improve cell density in Singapore.

High Quality Connectivity

As real-time Internet services and applications become increasingly popular among users, it is important that users enjoy sufficiently high data speed and low latency access across different networks to support these services and applications. For example, services such as Internet telephony should be provisioned with minimal latency as users switch from one network to another, while other services such as HD video streaming should be provided with sufficiently high bandwidth so that users can enjoy an uninterrupted viewing experience. HetNet will optimise the utilisation of spectrum and network resources to make this possible.

Enhance Resiliency & Security

Consumer devices will be able to roam across different environments covered by networks of different mobile technologies and maintain seamless access to Internet services. Therefore, users will remain connected even when a particular network is down.

HetNet Trials

To help visualise the potential benefits of HetNet to consumers and enterprises, IDA will be conducting a series of HetNet trials with the participation of M1, MyRepublic, Singtel and StarHub.

[1] "Small cells" are low-powered radio access nodes that have a range of ten metres to several hundred metres and are "small" compared to the macro base stations which may have a range of up to tens of kilometers.

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The trials are expected to commence in Q3 2015, and targeted to be completed by end 2015. It will be rolled out in the Jurong Lake District, and some of the locations include lifts, pedestrian walkways, bus interchange and MRT station. Through these trials, industry players will evaluate efficient and optimal solutions to easing network congestion in areas with heavy human traffic and delivering high speed and consistent mobile connectivity. They will also test new methodologies, using small cells to improve mobile coverage in traditionally low or weak coverage areas such as HDB lifts or void decks.

Each participant is rolling out its own HetNet Test Circuits to evaluate the technical feasibility of providing uninterrupted high-speed Internet access to users, when the typical user moves from his home to public areas such as the MRT station.

Existing deployments of LTE leverage on a duplexing technique called Frequency Division Duplex (FDD). For these trials, besides LTE-FDD, some participants will be deploying LTE using a new duplexing technique called Time Division Duplex (TDD) which enables more flexibility in spectrum utilization. One of the objectives of the trials is to enable the interworking of LTE-FDD and LTE-TDD so that mobile devices may access both networks seamlessly. Participants would also be assessing the viability of deploying small cells in areas of high human traffic to ease network congestion there.

Benefits for Citizens

HetNet is expected to bring about immediate and long term benefits for citizens. Commuters will benefit from better mobile and wireless connectivity at congested areas because of the enhanced infrastructure. Smart Nation applications such as tele-medicine, autonomous vehicles, remote health monitoring, and remote learning can be made available in the future with the help of HetNet technological innovation and a good foundation of critical telecommunication infrastructure from the industry.

Benefits for Industry

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The HetNet trials will also provide technology and engineering companies as well as Research Institutes such as I2R the opportunity for collaborative efforts with stakeholders within the telecommunication industry. These trials will facilitate the development of solutions to meet real and current challenges faced by the industry such as increasing data demands of consumers and devices in areas of IOT and M2M development. In addition, innovation and solutions are also needed to address areas of resource scarcity such as spectrum availability, manpower to manage infrastructure and limitation of space for infrastructure deployment. It is envisioned that the HetNet trials will facilitate and catalys the growth in Smart Nation innovation in this industry.

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