



Suruhanjaya Komunikasi dan Multimedia Malaysia
Malaysian Communications and Multimedia Commission

PUBLIC CONSULTATION PAPER
Implementation of Fixed Number Portability (FNP) in Malaysia

18 December 2020

TABLE OF CONTENTS

1.0	PREFACE	3
2.0	ABBREVIATIONS	4
3.0	LEGISLATIVE CONTEXT	5
4.0	INTRODUCTION.....	6
5.0	BACKGROUND.....	9
5.1	FIXED TELECOMMUNICATIONS MARKET	9
5.2	MOBILE NUMBER PORTABILITY IN MALAYSIA	11
6.0	INTERNATIONAL BENCHMARKING.....	13
6.1	ANALYSIS OF FNP IMPLEMENTATION BASED ON BENCHMARKING STUDY	15
6.2	ASSESSMENT OF INTERNATIONAL BEST PRACTICE	21
7.0	TECHNICAL ASPECTS OF FNP	22
7.1	FNP SERVICES	22
7.2	TECHNICAL SOLUTIONS FOR FNP	26
8.0	COSTS OF FNP	31
9.0	PROCEDURAL ASPECTS OF FNP	34
	ANNEX	38
	A. LIST OF QUESTIONS.....	39
	B. TEMPLATE FOR RESPONSE	41

1.0 PREFACE

The objective of this Public Consultation is to seek views and comments from the industry, interested parties and members of the public on the implementation of Fixed Number Portability (FNP) in Malaysia.

Confidential treatment may be requested on any part of the submission that is believed to be proprietary, confidential or commercially sensitive with supporting justification for MCMC's consideration. In such cases, the submission must be provided in a non-confidential form suitable for publication, with any confidential information redacted as necessary and placed instead in a separate annexe and clearly marked as "CONFIDENTIAL".

If MCMC grants confidential treatment, it will consider, but will not publicly disclose the information. However, if MCMC rejects the request, the information will be returned and not to be considered as part of the submission. Any submission that requests confidential treatment for all, or a substantial part of the submission, will not be accepted by MCMC.

MCMC invites submissions on all proposals put forward in this document concerning the procedures, processes, cost implications and technical solutions involved in implementing FNP in Malaysia. In particular, MCMC invites comments on the specific questions outlined herein. All submissions should be provided to MCMC in full on or before **12:00 noon, 1 March 2021**.

Submissions should be addressed to:

Malaysian Communications and Multimedia Commission

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2.0 ABBREVIATIONS

ACQ	All Call Query
CMA 98	Communications and Multimedia Act 1998
ADSL	Asymmetric Digital Subscriber Line
CD	Call Dropback
Celcom	Celcom Axiata Berhad
DEL	Direct Exchange Line
DN	Directory Number
ECC	European Communications Commission
FNP	Fixed Number Portability
IN	Intelligent Network
MSAP	Mandatory Standard on Access Pricing
Maxis	Maxis Communications Berhad
MCMC	Malaysian Communications and Multimedia Commission
MNP	Mobile Number Portability
MVNO	Mobile Virtual Network Operator
NEAP	Numbering and Electronic Addressing Plan
NGN	Next Generation Network
NPC	Number Portability Clearinghouse
NPDB	Number Portability Database
OR	Onward Routing
QoR	Query on Release
RCF	Remote Call Forwarding
RN	Routing Number
TIME	TIME dotcom Berhad
TM	Telekom Malaysia Berhad

3.0 LEGISLATIVE CONTEXT

- 3.0.1 Under Section 179(1) of the Communications and Multimedia Act 1998 (Act 588) (CMA 98), Malaysian Communications and Multimedia Commission (MCMC) is vested with the control, planning, administration, management and assignment of the numbering and electronic addressing of network services and applications services.
- 3.0.2 Pursuant to Section 180(1) of the CMA 98, MCMC is responsible for the development of a Numbering and Electronic Addressing Plan (NEAP) for the numbering and electronic addressing of such network services and applications services.
- 3.0.3 Section 180(2) of the CMA 98 provides that the Plan may set out rules which include the portability of assigned numbers and electronic addresses. The NEAP currently specifies the need to implement Mobile Number Portability (MNP).
- 3.0.4 The sub-regulation 25 of the Communications and Multimedia (Numbering) Regulations 2016 also states that:
- 1) An assignment holder who is required by the Commission to implement number portability service shall comply with the requirements specified in the NEAP.
 - 2) Any assignment holder who contravened sub-regulation (1), commits an offence and shall, on conviction, be liable to the penalty provided under Section 242 of the CMA 98.

4.0 INTRODUCTION

4.0.1 Fixed Number Portability (FNP) is a process by which customers may keep their fixed telephone number when changing either service provider, service or location (or any subset thereof). The first country to roll-out FNP was Hong Kong, doing so when it liberalised the fixed telephony market in 1995.¹ Since then, FNP has been rolled out in countries across the world, often in combination with MNP. However, the exact portability services on offer, as well as the technical solutions which have been applied to implement portability are varied.

4.0.2 The implementation of FNP removes a potentially significant barrier to customer choice and switching, thus facilitating more effective competition in the fixed telephony market. Furthermore, coupled with the rise of bundled services, it may exert a wider influence on competition across the telecommunications market including the fixed broadband market. The potential benefits to all of the key stakeholders are summarised below:

a) **Consumer and business customers:** The primary benefits of FNP to customers arise from the increased ease of switching, allowing customers the freedom to choose the service provider which offers the best value product. In the case of those customers that would switch provider in the absence of number portability, there may be additional benefits attributable to the avoidance of costs directly related to changing fixed telephone number. Such benefits may be particularly relevant to business customers, for whom it may be possible to avoid costs associated with informing potential callers of the number change; changing letterheads or business cards; changing advertising material and possible loss of business. It is important to note that these benefits are not restricted to porting customers; FNP would also benefit callers to ported numbers.

b) **Service providers:** Service providers would benefit from the successful implementation of FNP. It provides a structure by which they may compete fairly for customers

¹ Yankee Group, Number Portability Through the Global Lens, July 2012.

based on the relative merits of their service offerings. FNP lays a platform for innovation and price-based competition.

Industry: The primary benefits of FNP to the telecommunications industry as a whole relate to the aforementioned pro-competitive effects. FNP would significantly decrease the cost of switching to customers, providing further incentives for service providers to invest in improved services and price offerings so as to compete against one another for both new and existing users. In a competitive landscape supported by portability, service providers can improve the value they offer to customers in the long-term by increasing the efficiency of their operations, thus improving the overall health of the industry.

- 4.0.3 Since 2016, several service providers have been expressing their interest in fixed services market and support FNP implementation in Malaysia. These service providers believe that FNP will reduce barriers presented to customers when switching service provider.
- 4.0.4 During an industry consultation on the National Fiberisation and Connectivity Plan (NFCP) in October 2018, MCMC received requests from service providers to implement FNP. MCMC in its response stated that it encourages any initiatives that would benefit customers.
- 4.0.5 Furthermore, the government had recently launched Pelan Jalinan Digital Negara (JENDELA) initiatives that among others to increase the fixed broadband connectivity by expanding fibre infrastructure to sub urban and rural areas. It is targeted to increase gigabit access from 4.95 million to 9 million premises passed by 2025.
- 4.0.6 In this Public Consultation, MCMC seeks input on several key questions, including the most appropriate, effective FNP service(s) and technical solution(s) to implement, as well as how the process should be administered. MCMC also seeks input on how to expedite the implementation of FNP utilising a method that is simple and inexpensive both for consumers and service providers.

- 4.0.7 MCMC has appointed Aetha Consulting Limited (Aetha), to undertake a feasibility study on the implementation of FNP in Malaysia. MCMC has also engaged all fixed service providers in June 2020 by circulating questionnaires followed by virtual meeting with each service provider to gauge industry's readiness on FNP.
- 4.0.8 This document outlines the results of the study and MCMC's preliminary position with regard to FNP implementation. This document is structured as follows:

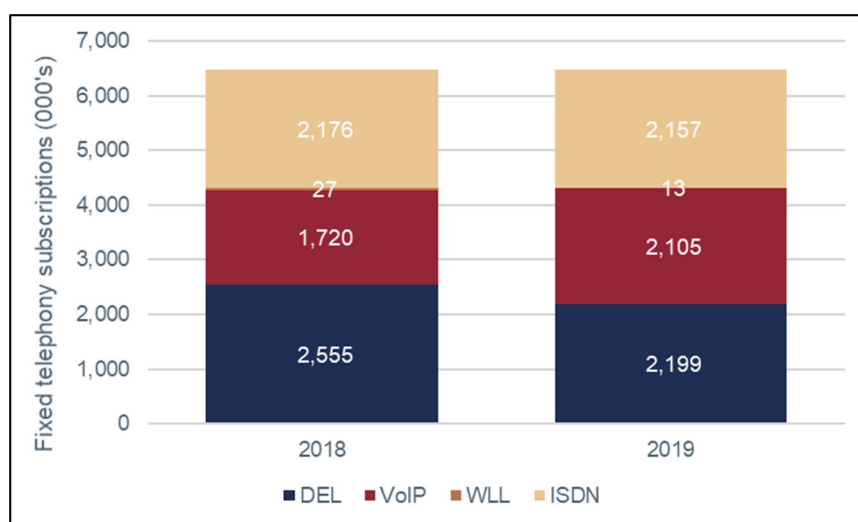
Section 5: Background	
5.1	The fixed telecommunications market
5.2	Mobile Number Portability in Malaysia
Section 6: International benchmarking	
6.1	Analysis of the case for FNP based on benchmarking <ul style="list-style-type: none">• Take-up of FNP services• The development of fixed telecoms pricing• The development of service bundling• The development of fixed broadband penetration• The overall case for FNP implementation
6.2	Assessment of international best practice
Section 7: Technical Aspects of FNP	
7.1	FNP services <ul style="list-style-type: none">• Service provider• Service portability• Location portability
7.2	Technical solutions
Section 8: Costs of FNP	
Section 9: Procedural Aspects of FNP	

5.0 BACKGROUND

5.1 FIXED TELECOMMUNICATIONS MARKET

5.1.1 There are currently eight (8) service providers which have been assigned with Geographic Numbers. These service providers hold Network Service Provider (Individual) licence which are compulsory for an application of numbering assignments. The service providers are Celcom Axiata Berhad; Digi Telecommunications Sdn Bhd, Maxis Broadband Sdn Bhd, Redtone Engineering & Network Services Sdn Bhd, Telekom Malaysia Berhad, TTdotcom Sdn Bhd, XMT Technologies Sdn Bhd and YTL Communications Sdn Bhd.

5.1.2 As at end 2019, there were 6.48 million fixed telephone subscriptions, including 2.2 million Direct Exchange Line (DEL) subscriptions.² While DEL is decreasing annually, subscriptions for Voice-over-Internet Protocol (VOIP) are increasing, having gone from 1.72 million in 2018 to 2.1 million in 2019.³ This shows that fixed telephony is still relevant even when DEL subscriptions are decreasing, supported by the increase in VOIP subscriptions.



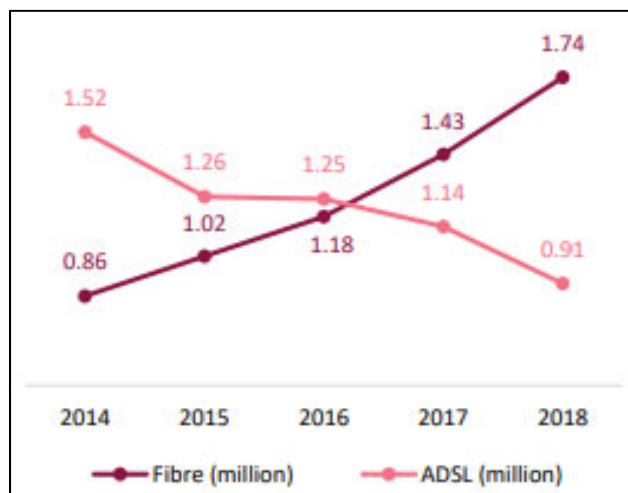
Graph 1: Fixed telephony subscriptions 2018-2019

5.1.3 The trends in fixed broadband market show that fibre broadband has taken over Asymmetric Digital Subscriber Line (ADSL). The penetration of fixed broadband has increased, driven by the take-

² MCMC, Communications and Multimedia: Facts and Figures, 1Q 2020, 13 July 2020.

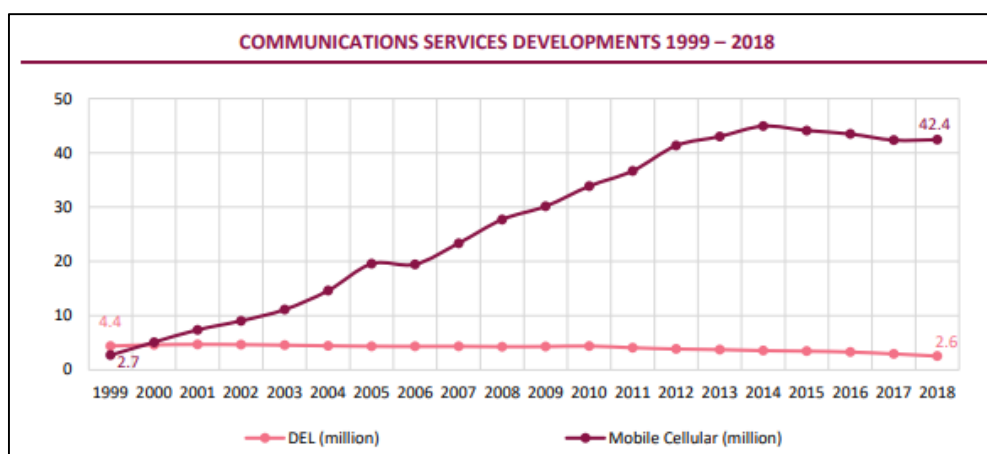
³ MCMC, Communications and Multimedia: Pocket Book of Statistics, 2019, 5 June 2019.

up of fibre broadband. The number of fibre subscriptions overtook the number of Asymmetric Digital Subscriber Line (ADSL) subscriptions in 2017 and grew by 21.7% in 2018⁴, as shown in Graph 2 below:



Graph 2: Fixed broadband subscriptions 2014-2018

5.1.4 It is noted that mobile subscriptions have exceeded the fixed subscriptions since year 2000.⁵ However, the reduction in the number of DELs has been offset by other services such as VoIP, ISDN and fixed wireless local loop (WLL) subscriptions.



Graph 3: DEL and Mobile Cellular subscriptions 1999-2018

⁴ MCMC, Industry Performance Report for 2018, 21 August 2019.

⁵ MCMC, Industry Performance Report 2018, 2019.

5.2 MOBILE NUMBER PORTABILITY IN MALAYSIA

5.2.1 Mobile Number Portability (MNP) was launched in Malaysia in 2008, marking the completion of a process which started with the Ministerial Direction on Number Portability (Direction No. 2 of 2004) issued on 10 September 2004.⁶ Thereafter, a consultation process was launched to assess the impact of implementing MNP for the telecommunications industry. As part of this process, a Public Inquiry Paper on the Implementation of Mobile Number Portability in Malaysia was published on 1 September 2005,⁷ the outcome of which was published on 28 December 2005.⁸

5.2.2 MNP utilises the All Call Query (ACQ) methodology, a form of direct routing relying on the implementation of a Centralised Number Portability Clearinghouse (NPC) and a Centralised Number Portability Database (NPDB). For further details of this solution, please see Section 7.2.

5.2.3 The key characteristics of the MNP solution are summarised in Table 1 below:

Implementation Year	2008
Type of Portability	Service Provider Portability
Technical Solution	All Call Query (ACQ)
Porting Charge	RM25
Porting Time	<ul style="list-style-type: none"> • 2 days for consumers • 5 days for businesses

Table 1: Information on MNP

5.2.4 Whilst fixed and mobile markets are two distinctly different market, there are similarities when it comes to deciding the most appropriate method to implement number portability. There are additional benefits of harmonising the FNP and MNP processes, notably in terms of ensuring simple, coordinated customer experience. Thus, the current MNP system provides a useful reference point when considering the implementation of FNP.

⁶ Minister of Energy, Water and Communications, Ministerial Direction on Number Portability – Direction No. 2 of 2004, 10 September 2004.

⁷ MCMC, Public Inquiry Paper – Implementation of Mobile Number Portability (MNP) in Malaysia, 1 September 2005.

⁸ MCMC, A Report on a Public Inquiry under Section 55(2), 55(4) and 61 of the Communications and Multimedia Act 1998 on Implementation of Mobile Number Portability (MNP) in Malaysia, 28 December 2005.

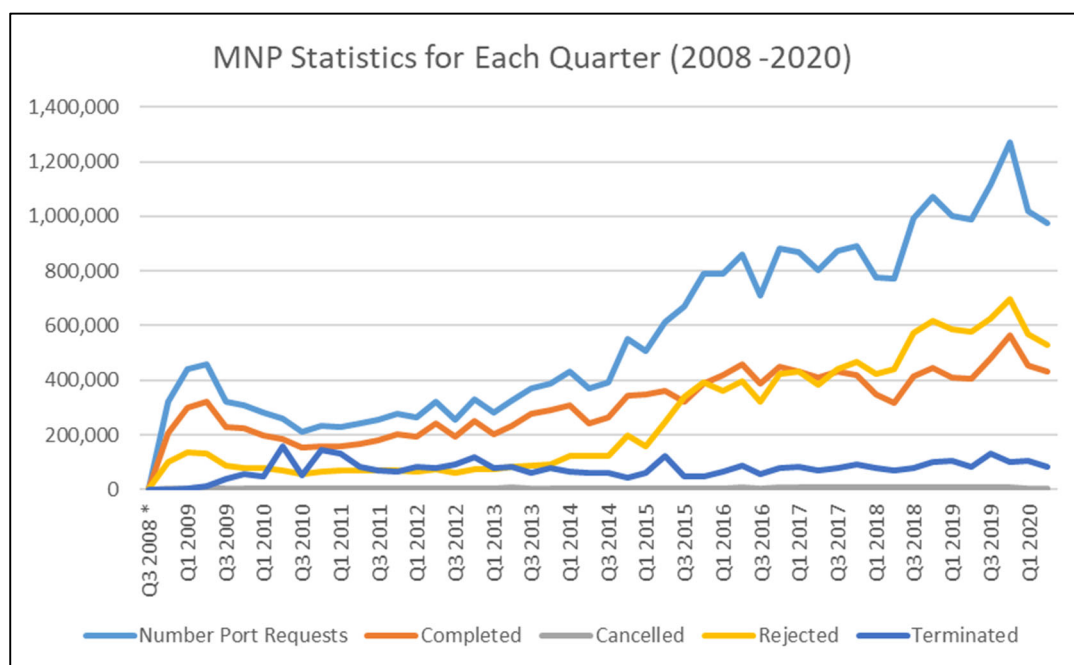
Therefore, MCMC's view on FNP takes into account the structure of the current MNP regulations.

5.2.5 MNP has proved to be a successful tool in facilitating competition in the mobile market. Since Q1 2019, the demand for MNP has been high. Table 2 below shows the statistics for MNP in Malaysia for every quarter in 2019 and 2020:

Month	Number Port Requests	Completed	Cancelled	Rejected	Terminated
Q1 2019	1,000,586	411,493	5,880	586,544	105,400
Q2 2019	989,080	406,105	6,688	575,665	83,341
Q3 2019	1,115,865	480,396	8,425	624,355	131,346
Q4 2019	1,271,470	564,169	7,529	695,652	102,714
Q1 2020	1,019,126	454,536	5,670	570,812	103,272
Q2 2020	973,792	431,839	4,091	527,187	82,176

Table 2: MNP statistics for 2019 and 2020

5.2.6 Graph 4 below shows the overall trend for mobile number ports for each quarter from its initial implementation (Quarter 3 2008) until Quarter 2 2020.



Graph 4: MNP statistics overall trend 2008-2020

6.0 INTERNATIONAL BENCHMARKING

- 6.0.1 MCMC has commissioned a detailed international benchmark of FNP approaches in order to identify areas of best practice. The international benchmark aims to compile information on the portability services, the technical solution(s) employed, the implementation timeline, the porting process (including porting and donor compensation charges) and the take-up of FNP services over time in the following countries: Albania, Brazil, Bulgaria, Croatia, Hong Kong, Mexico, Singapore, South Korea, Spain, Sweden, United Kingdom and the United States of America.
- 6.0.2 These countries were selected to cover a wide range of FNP implementations, in order to assess the impact of various parameters for a successful implementation of FNP. In particular, these countries represent a range of implementation dates, technical approaches and geographical locations. The countries typically have an incumbent fixed telecoms service provider with several smaller competing service providers, similar to Malaysia. Another key consideration in the country selection was the availability of data.
- 6.0.3 The key findings for each country included in the benchmark are summarised in Table 3 below:

Country	Year ⁹	FNP Services ¹⁰	Technical Solution ¹¹	Porting Charge	Porting Time	FNP Take-up ¹²
Albania	2012	Service provider portability	All Call Query (ACQ)	Zero	1 Day (Reduced from 3 in 2018)	0.3% (2017)
Brazil	2009	Service provider portability	All Call Query (ACQ)	BRL 4.00	3 Days (Reduced from 5 in 2009)	3.7% (2018)

⁹ Year refers to the date on which commercial FNP was first offered.

¹⁰ Further details of the FNP Services are provided in Section 7.1.

¹¹ Further details of the Technical Solutions are provided in Section 7.2.

¹² FNP take-up is defined as the total number of numbers ported annually divided by the total number of fixed voice subscribers. The figures presented here represent the most recent year for which data has been sourced but time-series data has been collected where possible.

Country	Year ⁹	FNP Services ¹⁰	Technical Solution ¹¹	Porting Charge	Porting Time	FNP Take-up ¹²
Bulgaria	2009	Service provider portability & location portability within a single area code	All Call Query (ACQ) or Onward Routing (OR)	Zero	3 Days	3.3% (2017)
Croatia	2005	Service provider portability	All Call Query (ACQ)	Zero	5 Days	12.9% (2018)
Hong Kong	1995	Service provider portability & location portability	All Call Query (ACQ) with interim OR from 1995-96	Unknown	7 Days	1.5% (2019)
Mexico	2008	Service provider portability	All Call Query (ACQ)	Zero (Reduced from MXN17 in 2015)	1 Day	2.9% (2016)
Singapore	2000	Service provider portability & location portability	Query on Release (QoR)	Unknown	5 Days	Unknown (Data not published by the regulator)
South Korea	2003	Service provider portability	Hybrid - ACQ (Transition to ACQ from RCF ¹³)	KRW 2,000	2 Days	5.5% (2011)
Spain	2000	Service provider portability	All Call Query (ACQ)	Zero	1 Day (Reduced from 5 in 2013)	12.0% (2018)
Sweden	1999	Service provider portability	All Call Query (ACQ)	Zero	3 Days (10 for Business)	5.4% (2019)

¹³ Remote Call Forwarding.

Country	Year ⁹	FNP Services ¹⁰	Technical Solution ¹¹	Porting Charge	Porting Time	FNP Take-up ¹²
United Kingdom	1997	Service provider portability	Onward Routing (OR)	Not regulated but no retail charges in practice according to the regulator	1 Day	Cumulatively 10% 1997-2004 (Data not published by the regulator)
United States	1998	Service provider, service & location portability	All Call Query (ACQ)	Not regulated – varies by service providers	1 Day (Reduced from 4 in 2009)	7.4% (2009)

Table 3: Summary of international benchmarking findings

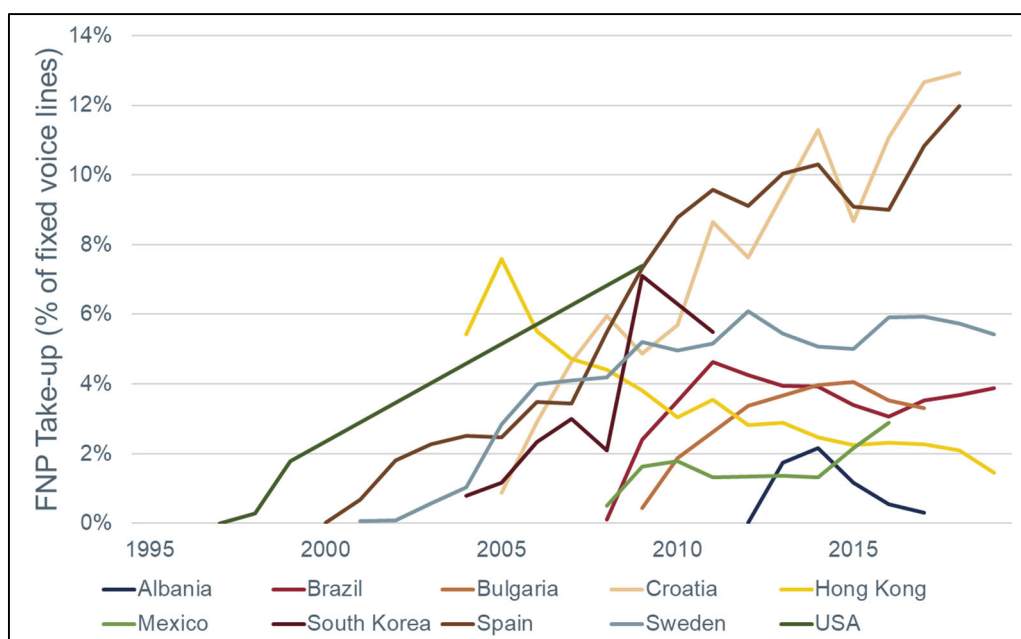
6.1 ANALYSIS OF FNP IMPLEMENTATION BASED ON BENCHMARKING STUDY

6.1.1 In order to establish whether there is a case for the implementation of FNP in Malaysia, MCMC has analysed various factors in the international benchmark countries which may indicate their success or failure of FNP implementation. Factors which have been considered are as follows:

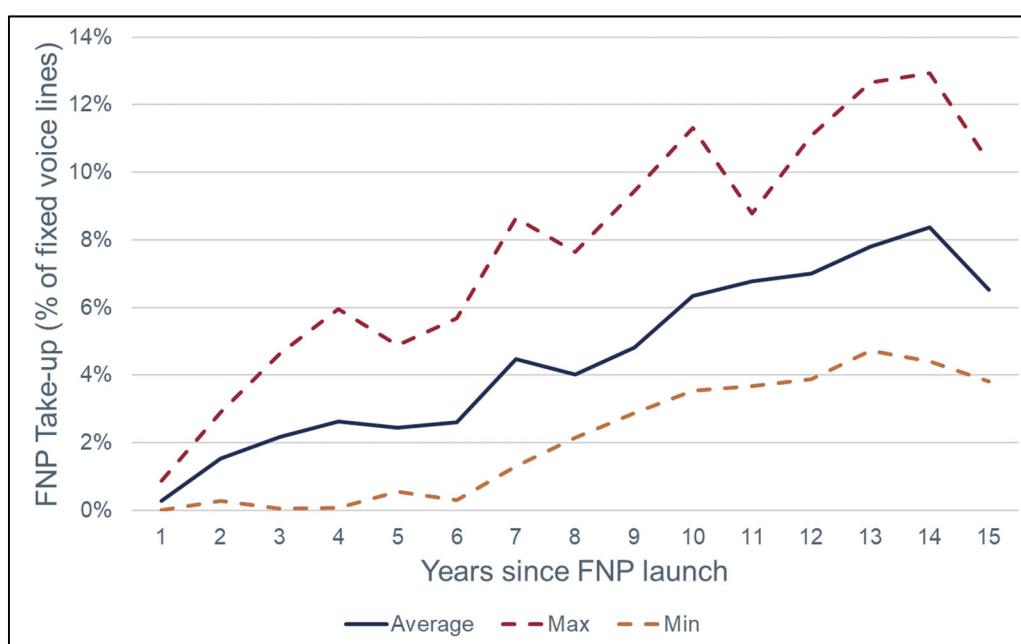
- a) Take-up of FNP services;
- b) Fixed telecoms pricing trend;
- c) Service bundling;
- d) Development of fixed broadband penetration.

TAKE-UP OF FNP SERVICES

6.1.2 Analysis of the twelve (12) benchmark countries shows the following trend for the take-up of FNP services over time:



Graph 5: FNP take-up in benchmark countries



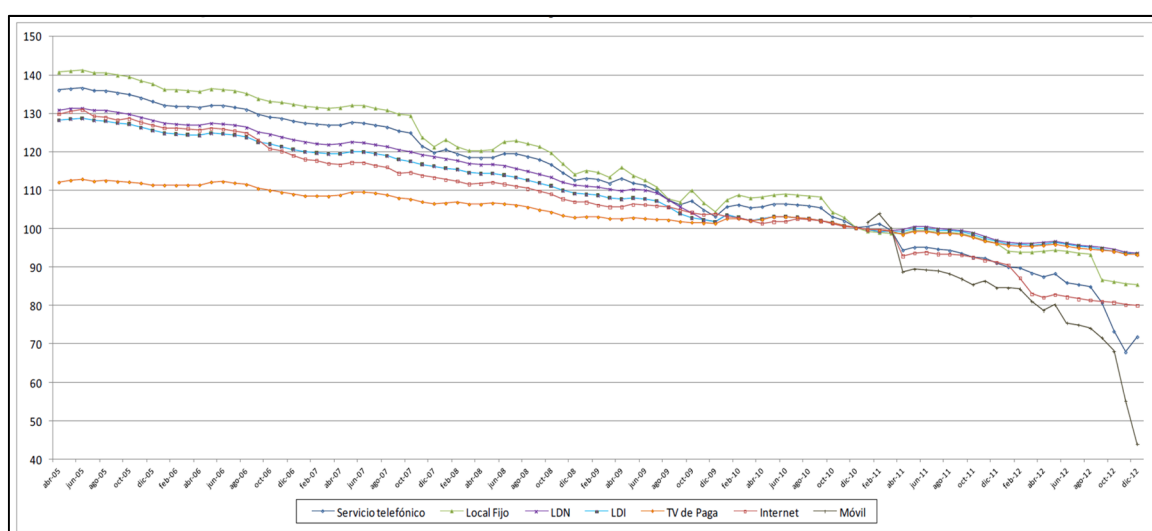
Graph 6: Average FNP take-up since launch in benchmark countries

6.1.3 Majority of benchmarked countries show a clear increasing trend in take-up after FNP launch. This is likely a result of increased awareness of the service and may also be influenced by factors such as reduced porting time and costs, as well as other reasons for customer switching. Therefore, introduction of FNP is still likely to elicit significant competition benefits.

FIXED TELECOMS PRICING TREND

6.1.4 One of the key objectives of FNP implementation is to elicit an increase in competition and correspondingly, a reduction in service prices for customers. MCMC has identified some evidence of reduced prices in the benchmark countries following their FNP launch.

6.1.5 Graph 7 below shows the price index of telecommunications services in Mexico across the period 2005-2012. For reference, FNP was launched in Mexico in July 2008.



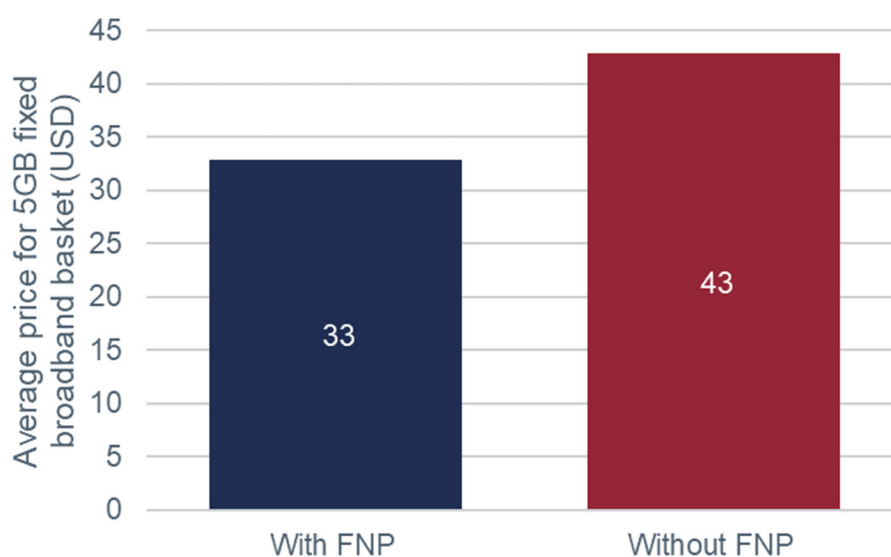
Graph 7: Price Index of Telecommunications Services in Mexico (2005-2012)
[Source: ITEL, Índice de Producción del Sector Telecomunicaciones, 2012]

6.1.6 Graph 7 shows that the prices of all telecoms services included in this figure, including fixed telephony, decreased over the period 2005-2012. In particular, the price index for local fixed telephony, shown in Green in Graph 7, decreased from ~120 in July 2008 (the date of FNP launch in Mexico) to ~85 in December 2012. However, decreases were also observed in the price indexes of internet services, national and international long-distance telephony, which are shown in Red, Purple and Blue in Graph 7, respectively.

6.1.7 These data points give insight to the impact that FNP can have on telecoms service pricing, along with other pro-competitive measures. Whilst it is not possible to draw a direct relationship between these reductions in service pricing and the introduction

of FNP, it is likely that the introduction of FNP, which occurred in conjunction with the introduction of MNP in Mexico, played a significant role in shaping the competitive landscape.

6.1.8 MCMC has also analysed the prices paid for fixed broadband in the benchmark countries, all of which have implemented FNP, as well as several countries which have not implemented FNP.¹⁴ It is shown that, on average, a 5GB fixed broadband basket costs USD32.80 in the benchmark countries (when adjusted for Purchasing Power Parity (PPP)).¹⁵ In comparison, the average price of an equivalent bundle in the countries that had not deployed FNP was USD42.80. This is equal to a price reduction of ~23% in countries that have deployed FNP, relative to those that have not. Therefore, the implementation of FNP is likely to impact on the prices paid for fixed services to the benefit of all customers, not just those who port.



Graph 8: Fixed broadband price comparison between countries with and without FNP

THE DEVELOPMENT OF SERVICE BUNDLING

6.1.9 Service bundling is something which has risen in popularity worldwide over the last 10-15 years. Therefore, it is interesting to analyse the popularity of fixed voice services bundles including

¹⁴ MCMC researched the same countries as for our comparison of incumbent market share. The countries in question, all of which have not implemented FNP, were Ecuador, Ghana, Guatemala, India, Nigeria, Pakistan, Peru, Philippines and Sudan.
¹⁵ ITU, ICT Price Baskets (IPB) - Fixed-broadband basket 5GB, 21 July 2020.

other fixed and mobile telecoms services, such as fixed broadband.

- 6.1.10 The table below shows the proportion of households subscribing to fixed voice services as part of a bundled offering in Europe.

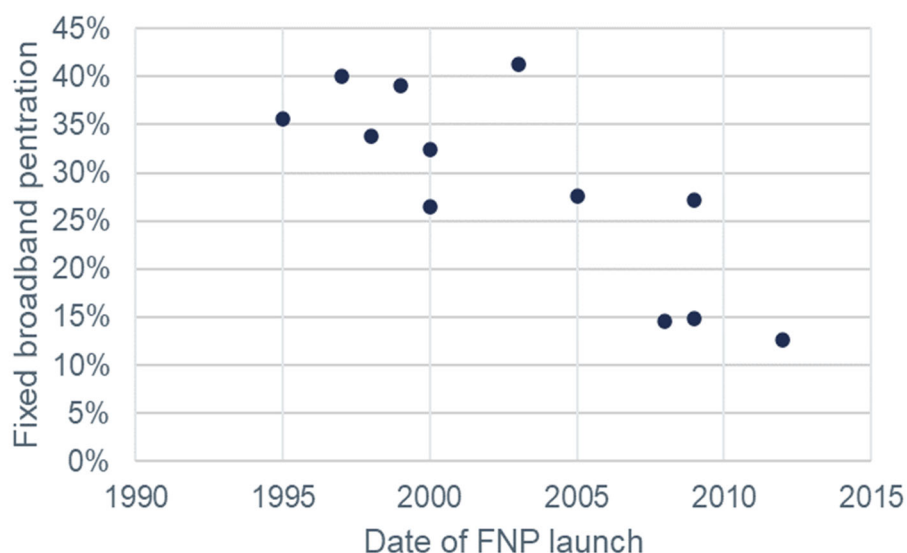
Country	Proportion of Households with fixed voice as part of a bundle in 2016 (%)	Proportion of Households with fixed voice as part of a bundle in 2017 (%)
Bulgaria	19%	19%
Croatia	56%	58%
Spain	72%	75%
Sweden	26%	20%
United Kingdom	69%	72%
EU Average	59%	61%

Table 4: Proportion of Households with fixed voice as part of a bundle in Europe (2016-2017) [Source: European Commission, Financial indicators, fixed and mobile telephony, broadcasting and bundled services indicators 2017, February 2019]

- 6.1.11 The key observation to make from Table 4 above is that, in majority of the benchmark countries, the proportion of households subscribing to fixed voice services as part of a bundle is significant and increasing, with the notable exception of Sweden. Therefore, the impact of FNP on customer switching in markets other than the fixed voice market is significant and likely to increase.

FIXED BROADBAND PENETRATION

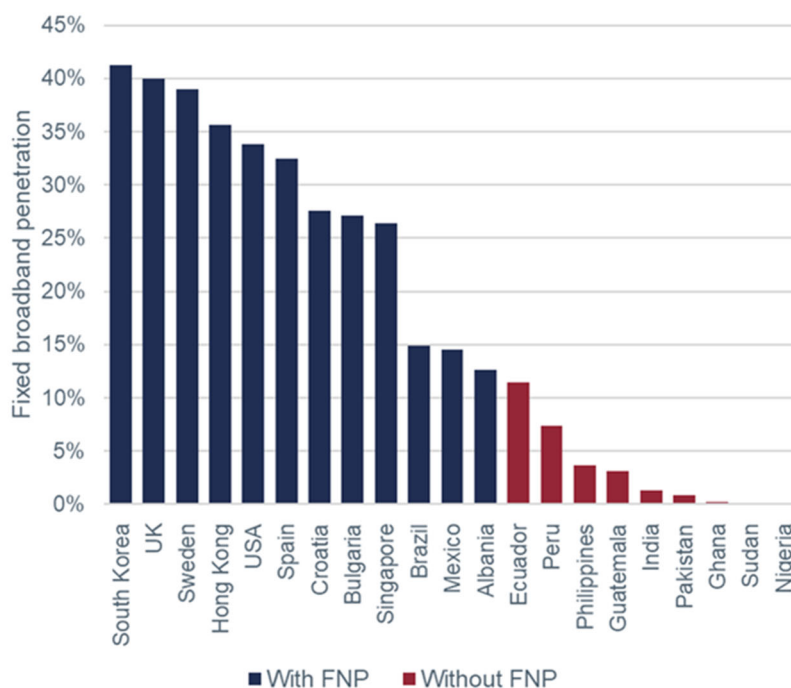
- 6.1.12 MCMC is of the opinion that it is important to ensure that the FNP implementation has a positive impact towards fixed broadband penetration. Therefore, MCMC has plotted fixed broadband penetration in the benchmark countries (as of 2018) against the date of FNP launch, as shown in Graph 9 below.



Graph 9: Fixed broadband penetration versus date of FNP launch

6.1.13 Based on the observation made on Graph 9, the earlier FNP was launched, the greater the fixed broadband penetration was likely to be and vice versa. This shows that the introduction of FNP may have a positive effect on the development of the fixed broadband market.

6.1.14 Meanwhile, Graph 10 below shows fixed broadband penetration comparison for countries with and without FNP:



Graph 10: Fixed broadband penetration comparison for countries with and without FNP

- 6.1.15 Therefore, there is an association between FNP implementation and fixed broadband penetration. Putting Malaysia's position into perspective, our position is similar to the position of other countries without FNP at 9.3%¹⁶ of fixed broadband penetration.

6.2 ASSESSMENT OF INTERNATIONAL BEST PRACTICE

- 6.2.1 MCMC has identified several areas of best practice for effective FNP implementation. The European Communications Commission (ECC) has produced a document summarising best practice with regard to number portability in 2010.¹⁷

- 6.2.2 The identified international best practice includes the following:

- a) To implement service provider portability in order to ensure effective customer switching.
- b) To adopt a technical solution based on direct routing principles, for example, using ACQ or an equivalent routing method, supported by a centralised Number Portability Database (NPDB).
- c) To adopt a recipient-led porting process for FNP (i.e. a 'one stop shop').¹⁸
- d) To ensure the number portability process is as quick and efficient as is practicably possible:
 - To define the maximum porting time and review this regularly such that, if possible, it is reduced. In the benchmark countries, it can be one day.

¹⁶ MCMC, Communications and Multimedia: Facts and Figures, 1Q 2020, 13 July 2020.
¹⁷ Electronic Communications Committee, Number Portability – Best Practices, 11 May 2012.

¹⁸ Subscribers should be able to port their number simply by contacting the recipient service provider. Previously, FNP processes (for example in Bulgaria) have required customers to inform both donor and recipient service providers, introducing inefficiency to the porting process which may pose a barrier to effective switching.

- To define the maximum time for loss of service, ensuring it is as short as possible. For example, it should be significantly shorter than one working day.
 - To identify the acceptable reasons for rejecting a port request within the number portability regulations, so as to avoid invalid rejection by the donor service provider and guarantee the subscriber is able to exercise their right to port.
- e) To synchronise processes such as FNP and MNP where fixed and mobile service bundles are common. This is necessary in order to facilitate a quick, efficient switching of bundled services.

Question 1:

Based on the findings from the benchmarking exercise, MCMC seeks general views and comments on the implementation of FNP in Malaysia.

7.0 TECHNICAL ASPECTS OF FNP

7.1 FNP SERVICES

7.1.1 There are three types of FNP services, as described below:

- a) **Service provider portability:** It allows a customer to change service provider (without changing location) whilst keeping the same telephone number.
- b) **Service portability:** It allows a customer to change, for example, from fixed services to mobile services (without changing service provider or location) whilst keeping the same telephone number.
- c) **Location portability:** It allows a customer to change location (without changing service provider) whilst keeping the same telephone number.

7.1.2 It is technically possible to implement any of the above FNP services in combination. Therefore, MCMC has considered each separately, accounting for the implications of deploying them both as standalone services and in combination with one another, where appropriate.

7.1.3 Table 5 below shows that service provider portability has been implemented by all benchmark countries. On the other hand, only one (1) country has implemented service portability whilst four (4) countries have implemented location portability.

Type of Portability	Number of Countries
Service Provider	12
Service	1
Location	4

Table 5: FNP services implemented by benchmark countries

7.1.4 Service provider portability offers multiple benefits which are as follows:

- a) Consumers will not have to go through the hassle of informing their contacts as and when they change their service providers.
- b) Results in cost savings for consumers who are currently prevented from switching by the prospective loss of their number.
- c) Increase levels of competition in the market and, consequently, leads to price reduction for all consumers (including non-porting consumers).

7.1.5 Currently, the cost of losing one's telephone number is likely to discourage consumers from switching service provider. Therefore, by removing this barrier to switching, consumers may be further motivated to switch service providers in order to enjoy lower prices and/or improved services. In turn, the increased level of competition may encourage service providers to prevent churn from their network, either in the form of improved services or reduced prices for existing customers.

- 7.1.6 There are significant costs associated with the implementation of service provider portability. These costs are, however, expected to be minimised due to the following:
- a) Prior implementation of Next Generation Network (NGN) technology in the networks of the service providers; and
 - b) Possible seamless integration and harmonisation of both MNP and FNP under existing Number Portability Clearinghouse (NPC) requires minimal changes to service providers network.
- 7.1.7 Majority of service providers indicated in their response to MCMC's industry questionnaire that they are in favour of the implementation of service provider portability, in consideration of the benefits highlighted above. In particular, several indicated that losing one's fixed number represents a barrier to switching and, therefore, removing this barrier is vital to increase competition.
- 7.1.8 In light of the benefits of service provider portability and input from service providers, MCMC would like to seek public views on this.

Question 2:

MCMC seeks public views for service provider portability to be considered for Fixed Number Portability implementation in Malaysia.

- 7.1.9 Service portability offers clear benefits, related to a customer's ability to retain their telephone number as their service requirements change. For example, with service portability a business would be able to move its main number from a fixed line to a mobile handset so that the owner can receive incoming calls whilst away from the office. Furthermore, there may be additional cost savings as a result of customers no longer requiring multiple voice services (i.e. acquisition of both fixed and mobile voice services).
- 7.1.10 The only benchmark country to have deployed service portability is the United States. Their consumers are able to transfer numbers between fixed and mobile services and vice versa. This was made possible by the adoption of a neutral numbering plan which does

not distinguish between fixed and mobile services. There is no need for clear differentiation between fixed and mobile numbers since calls to mobile are charged by the service providers on a receiving party pays basis.

7.1.11 Currently, numbering plan in Malaysia differentiates between geographic numbers and mobile numbers where geographic numbers would indicate geographical location of the person while mobile numbers does not (due to its nomadic characteristic). Malaysia also implement a " Calling Party Pay" model where the total cost of a call is borne by the caller. Therefore, it is safe to assume that the implementation of service portability is likely to require a major revamp to the interconnection regime and the numbering plan.

7.1.12 Considering the above, MCMC is of the view that service portability not to be considered at this juncture as the implementation would disrupt the fixed services market.

Question 3:

MCMC seeks public views on its proposal that service portability not to be considered for Fixed Number Portability implementation in Malaysia.

7.1.13 The benefits of location portability to customers are clear; they avoid the direct costs of informing their contacts of their number change when moving location. There are, however, no wider benefits to subscribers who are not moving location – and in many cases there is an administration cost associated with informing contacts of their new address, so the incremental cost of informing contacts of their new telephone number is limited. The implementation of location portability is not expected to have any impact on competition.

7.1.14 MCMC expects that the costs of deploying location portability are likely to be low, particularly at the network level. There may, however, be additional administrative costs related to the numbering assignment. However, the administrative barriers to location portability are low in comparison to service portability and may be mitigated by, for example, restricting the scope of location portability services to within specific geographical areas.

- 7.1.15 A total of 4 of the 12 benchmark countries have deployed location portability, representing a significant minority. In all cases that location portability has been deployed, it has been done in combination with service provider portability and, in the case of the United States, service portability.
- 7.1.16 Majority of service providers indicated that they were in favour of implementing location portability. The costs of implementing location portability would be small as a result of their existing NGN networks. Some service providers did, however, indicate that if location portability were to apply across state boundaries (i.e. nationally), significant changes to MCMC's Numbering and Electronic Addressing Plan (NEAP) would be required.
- 7.1.17 Based on the above, MCMC proposes the implementation of location portability within state boundaries as to maintain each state's area code.

Question 4:

MCMC seeks comments on its proposal that location portability (within state boundaries) to be considered for Fixed Number Portability implementation in Malaysia.

7.2 TECHNICAL SOLUTIONS FOR FNP

- 7.2.1 There are several technical solutions available for the implementation of FNP. In order to fully assess these technical solutions, this document separates the issue into two parts:
- a) The portability provisioning process; and
 - b) The call routing process.
- 7.2.2 The portability provisioning process relates specifically to the processing of port requests and the method of communication between service providers. There are two main approaches to the processing of number portability requests:

- a) **Bi-lateral approach:** Service providers communicate directly with one another, as dictated by commercially agreed bi-lateral agreements. These agreements must cover the exchange and validation of data, as well as the notification process for executed port requests. This approach has been adopted, for example, in the United Kingdom,¹⁹ however, it has several disadvantages. For example, it poses additional challenges for new service providers entering the market as they are required to agree bi-lateral agreements with existing service providers in order to provide portability services.
- b) **Centralised clearinghouse approach:** Service providers communicate via a single centralised system known as the Number Portability Clearinghouse (NPC). Within this approach, the NPC acts as a single point of contact, via which service providers may initiate and respond to port requests according to pre-agreed rules. The NPC provides a platform via which messages may be exchanged and validated, data may be transferred, and service providers notified of any executed port requests. Furthermore, a central reference database is maintained to provide details of directory number (DN)/routing number (RN) mappings for all ported numbers. This database may be used to update the local Number Portability Database (NPDB) of service providers. Additional benefits of the portability clearinghouse approach include the ease with which service providers and/or MCMC may obtain statistical data related to number portability (for example, the number of port requests, completed ports and success rate etc.). This is the approach adopted for MNP in Malaysia.

7.2.3 A NPDB is required to store data regarding the current location of ported numbers in the fixed network. Specifically, the database contains the necessary information to translate the DN into a RN. This is true across all FNP solutions, however, there are several different options available. Nevertheless, they may be split broadly into two categories:

¹⁹ Electronic Communications Committee (ECC), Number Portability Efficiency: Impact and Analysis of Certain Aspects in Article 30.4 of the Universal Service Directive and General Remarks on NP Efficiency, November 2010.

- a) **Centralised:** This solution relies on a single centralised database, typically operated by a third party. At a minimum, the centralised database must contain information regarding all ported telephone numbers, however, it often contains details of all telephone numbers regardless of their porting status. This is the approach adopted for MNP in Malaysia.
 - b) **Distributed:** This solution relies on several NPDBs, each of which only contains a subset of the data that would be contained in a single centralised database.
- 7.2.4 The NPC approach is preferred internationally, supported by a centralised NPDB. Indeed, this approach has been employed in 10 of the 12 countries included in the international benchmark, as well as for MNP in Malaysia. The primary benefits of this approach are related to the establishment of a clear set of rules by which service providers must communicate and share data related to the porting process, thereby reducing the likelihood of problems related to, for example, the invalid rejection of port requests by the donor service provider.
- 7.2.5 There was widespread support from service providers for the adoption of a centralised NPC/NPDB solution, in line with that currently applied for MNP in Malaysia. Some service providers, however, raised concerns regarding the costs of establishing a centralised NPDB.
- 7.2.6 Once a number has been ported, there are several different call routing methodologies that could be implemented. MCMC outlines the call routing methodologies under active consideration below:
- a) **Onward Routing (OR):** This solution utilises a call forwarding mechanism to route calls from the donor network to the recipient network. In this approach, portability information is stored by the donor network - the originating network will have no knowledge of ported numbers and will therefore initially route the call to the donor network. The donor network then makes a NPDB query to obtain a RN, at which point the call is routed to the recipient network. This is a form of on-switch solution, meaning that information is

obtained from the donor network (i.e. the exchange at which the subscriber was initially located) and requires call forwarding.

- b) **Call Dropback (CD):** This solution requires the originating network to first route the call to the donor network, at which point it will perform a NPDB query to ascertain whether the number has been ported. If the number has been ported, the donor network will release the call back to the originating network with details of the recipient network. The originating network will then route the call to the recipient network. As with OR, the originating network will have no prior knowledge of ported numbers. Furthermore, it is also a form of on-switch solution.
- c) **Query on Release (QoR):** This solution requires the originating network to first route the call to the donor network to determine whether or not the number has been ported. If the number has been ported, the donor network will release the call back to the originating network indicating that the number has been ported. At this point, the originating network will perform a NPDB query before routing the call to the recipient network. This is a form of off-switch solution, meaning that portability information is transferred into an external database (which may be either centralised or distributed) that can then be queried by the originating network.
- d) **All Call Query (ACQ):** This solution utilises Intelligent Network (IN) technology to route calls directly to the recipient network (i.e. without the need to route the calls via the donor network). The originating network will interrogate a database to identify whether or not the number has been ported, allowing the call to be routed directly to the recipient network. This is another form of off-switch solution.

7.2.7 Typically, off-switch solutions such as ACQ and QoR, which utilise an external database to store porting information, result in shorter porting times and a correspondingly better customer experience which is likely to result in higher take-up. From a technical

perspective, off-switch solutions are therefore more efficient than on-switch solutions.

- 7.2.8 QoR requires calls to ported numbers to be routed to the donor network before then being rerouted to the recipient network. In contrast, all calls are routed directly to the recipient network if using the ACQ solution. Therefore, ACQ has a clear advantage over QoR in terms of performance – from a technical perspective, it is the most efficient call routing solution.
- 7.2.9 The establishment costs for off-switch solutions are typically greater than for on-switch solutions. However, the magnitude of establishment costs for off-switch solutions is expected to be comparatively low in Malaysia as a result of service providers' modern (i.e. NGN) networks. In contrast, the ongoing call conveyancing and administration costs are typically greater for on-switch solutions than for off-switch solutions.
- 7.2.10 Table 6 below shows that ACQ is the most commonly adopted solution in the international benchmarking, being adopted in 10 of the 12 countries. MCMC has therefore concluded that ACQ represents best practice. Furthermore, it is the solution adopted for MNP in Malaysia.

Technical Solution	Number of Countries
All Call Query (ACQ)	10
Onward Routing (OR)	2
Query on Release (QoR)	1

Table 6: FNP technical solutions implemented by benchmark countries

- 7.1.18 A clear majority of respondents to MCMC's industry questionnaire also indicated a preference for an ACQ call routing solution, with several highlighting that the establishment costs would be comparatively low as a result of service providers' modern (i.e. NGN) networks. All of those who did not were in favour of adopting an on-switch solution such as OR. In all such cases, the service provider's preference for OR was driven by concerns regarding establishment costs and their allocation between stakeholders.
- 7.2.11 Following careful review of international benchmarks and in line with the current technical solution applied for MNP, MCMC

proposes the adoption of an ACQ solution supported by a Centralised NPC utilising a Centralised NPDB.

Question 5:

MCMC seeks comment on its preliminary view that an All Call Query (ACQ) approach should be implemented, supported by a Centralised Number Portability Clearinghouse (NPC) utilising a Centralised Number Portability Database (NPDB).

- 7.2.12 Currently, ACQ with a centralised NPDB is already used for MNP in Malaysia. Therefore, MCMC is of the view that the most efficient manner in which to deploy FNP would be to upgrade and adapt the existing NPDB. The upgrade costs would be significantly lower than the cost of establishing a standalone solution. In light of this, it would be necessary to have a single database administrator for both FNP and MNP.

Question 6:

MCMC seeks comment on its preliminary view that FNP should be deployed by upgrading and adapting the existing Number Portability Database (NPDB) developed for MNP, with the process overseen by a single database administrator for both FNP and MNP.

8.0 COSTS OF FNP

- 8.0.1 There are costs associated with the implementation and continued operation of FNP. MCMC has identified three types of cost as follows:

- a) Establishment cost;
- b) Call conveyance cost; and
- c) Administration cost.

- 8.0.2 One-off establishment costs would be incurred both within the networks of service providers in order to ensure compliance with the FNP technical requirements, and in implementing a centralised NPC and NPDB solution. It is therefore important to establish how these costs should be allocated between service providers, with

the objective of ensuring that the implementation of FNP is cost-effective and results in the greatest possible benefits to the industry.

- 8.0.3 MCMC is of the view that the non-shared costs of implementation (i.e. those incurred by each service provider to perform the necessary network upgrades) should be borne directly by that service provider. This approach is in line with international benchmarks and best practice, as well as with the MNP guidelines. It was also supported by service providers in their response to MCMC's industry questionnaire.
- 8.0.4 Meanwhile, the shared costs of implementation (for example, those incurred in implementing the required centralised NPDB upgrades) should be recovered from service providers on the basis of cost recovery.
- 8.0.5 Service providers have raised concerns regarding the use of both a straight-line cost allocation approach, such as that used for MNP, and a market share cost allocation approach.
- 8.0.6 Within the straight-line approach, costs are divided equally between participants, regardless of their size. With regard to this approach, several service providers highlighted the risk of FNP becoming prohibitively expensive for small service providers, potentially forming an existential threat to their business. Furthermore, it may act as a barrier to market entry.
- 8.0.7 Conversely, if market share approach is applied, costs are allocated in direct correlation to market share. Service providers highlighted that the market share approach would allocate a large percentage of shared costs to the market-leading service providers, despite the fact that they are likely to suffer a negative impact on their market share as a result of FNP.
- 8.0.8 MCMC proposes to consider the use of a hybrid approach where the costs is split into a fixed and variable component, essentially adopting the straight-line approach for a certain proportion of costs and the market share approach for the rest. Details of the cost allocation approach would be finalised in consultation with industry through the formation of an industry working group.

Question 7:

MCMC seeks comment on its preliminary view that shared establishment costs should be recovered from service providers on the basis of cost recovery with costs allocated using a hybrid approach.

MCMC seeks comment on its proposal to finalise the details of the cost allocation mechanism in consultation with industry through the formation of an industry working group.

- 8.0.9 Service providers may incur ongoing call conveyancing costs attributable to additional call processing, signalling, call-set-up and routing for calls to ported numbers. However, any such costs are expected to be minimal if the recommended ACQ solution is applied.
- 8.0.10 Service providers may incur additional administrative costs related to the processing of individual port requests. MCMC is of the view that service providers should be permitted to recover the administrative costs of porting through the levying of charges equivalent to the Porting Charge and Donor Compensation as per the MNP guidelines. This approach would be in line with MCMC's assessment of best practice based on the results of the international benchmarking, as well as with the current MNP guidelines. Furthermore, there is widespread support for this approach within the industry.
- 8.0.11 The maximum level of administrative porting charges, however, should be limited. This is necessary to ensure that the porting charges do not act as a barrier to consumer switching. MCMC is of the view that the maximum Porting Charge and Donor Compensation Charge should be regulated in line with the approach currently applied for MNP.

Question 8:

MCMC seeks comment on its preliminary view that service providers should be permitted to recover the administrative costs of porting through the levying of Donor Compensation and Porting Charge. Furthermore, MCMC seeks comment on its proposal to regulate the maximum level of such charges.

9.0 PROCEDURAL ASPECTS OF FNP

9.0.1 In order for FNP to elicit significant benefits, it is essential that the service is successfully taken up. A key factor in take-up is the customer experience by which the process must be quick and efficient to ensure that it does not act as a disincentive to switching. However, the experience of customers is dependent on a range of factors, including the simplicity and speed of the porting process.

9.0.2 One key aspect of the porting process is whom the customer must contact in order to submit a port request. The assessment of best practice indicates that the porting process should be recipient-led. In other words, the customer should only be required to inform the recipient network of their intention to port. A recipient-led process has been adopted in all 12 of the benchmark countries, as well as for MNP in Malaysia. Furthermore, all service providers who responded on this point within MCMC's industry questionnaire were in support of a recipient-led porting process. Based on this, MCMC proposes that the porting process should be recipient-led. The proposed porting process under such a model is summarised below:

- a) The customer contacts the recipient service provider in order to initiate a port request.
- b) The recipient service provider performs any necessary checks to ensure the request is valid, in light of any restrictions placed on FNP.
- c) The recipient service provider notifies all other service providers of the port request.
- d) The donor service provider confirms that the port request is valid.
- e) The recipient service provider activates this number on its own network, thus completing the porting process.

Question 9:

MCMC seeks comment on its proposal that the porting process is recipient-led.

- 9.0.3 The length of time it takes to port is likely to be a major driver of FNP take-up. All 12 of the countries included in the international benchmark have implemented a maximum regulated porting time, in order to ensure effective customer switching. Table 7 below summarises the results of the international benchmarking with regard to the maximum regulated porting times.

Maximum Regulated Porting Times	Number of Countries
1 day	5
2 to 3 days	4
4 to 7 days	3

Table 7: Maximum Regulated Porting Times for FNP by Benchmark Countries

- 9.0.4 Service providers were also in support of MCMC regulating the maximum porting time. As such, MCMC intends to enforce a maximum regulated porting time, in line with best practice.

Question 10:

MCMC seeks comment on its proposal to set the maximum regulated porting time for FNP.

- 9.0.5 MCMC proposes that it is best practice to regulate the maximum permissible time for loss of service during the porting process.
- 9.0.6 It has done so following analysis of the international benchmark countries, as well as the best practice assessments of other industry bodies, including the ECC. The countries in the international benchmarking restricted the maximum time for loss of service to between 20 minutes and 3 hours. Furthermore, the ECC recommended that it should be significantly less than one working day.

Question 11:

MCMC seeks comment on its proposal to regulate the maximum permissible time for loss of service during the porting process.

- 9.0.7 MCMC proposes that it is best practice to clearly identify the acceptable reasons for rejecting a port request within the number portability regulations.
- 9.0.8 The objective in doing so is to ensure a quick and efficient porting process by preventing invalid rejection by the donor service provider and guaranteeing the subscriber is able to exercise their right to port. Therefore, it is MCMC's intention to limit the valid reasons for rejecting a port request, in line with international best practice. This approach would also be in line with that applied for MNP in Malaysia and was supported by service providers in their response to MCMC's industry questionnaire.
- 9.0.9 MCMC expects there to be benefits in harmonising the porting process for fixed and mobile numbers in Malaysia including, to the extent possible, the acceptable reasons for rejecting a port request. Therefore, MCMC is of the preliminary view that the acceptable reasons for rejecting a port request should, to the greatest possible extent, match those for MNP. The details of these acceptable reasons can be finalised in consultation with industry through the formation of an industry working group.

Question 12:

MCMC seeks comment on its proposal that the acceptable reasons for rejecting a port request should be defined within the FNP regulations. Furthermore, MCMC seeks comment on its proposal to, where possible, harmonise the acceptable reasons for rejecting a port request between FNP and MNP.

- 9.0.10 Win-back refers to the process via which donor service providers contact customers for marketing purposes on receipt of a port request. There are clear incentives for donor service providers to engage in such practices, in order to persuade customers to remain with their current network. Currently, the win-back practice is prohibited in MNP.

Question 13:

MCMC seeks comment on its preliminary view that win-back (i.e. the practice of donor networks contacting customers for marketing purposes on receipt of a port request) should be prohibited.

- 9.0.11 MCMC proposes that an industry working group to be established, as this would allow stakeholders to have meaningful input to the process of implementing FNP and would be in line with the approach adopted for MNP.

Question 14:

MCMC seeks comment on its intention to form an industry working group to finalise the details of the FNP guidelines.

ANNEX

A. LIST OF QUESTIONS

MCMC welcomes comments on the following questions and issues raised in this Public Consultation Paper. The list of questions for comment is summarised in the table below.

Subject	Questions
FNP implementation	Question 1: Based on the findings from the benchmarking exercise, MCMC seeks general views and comments on the implementation of FNP in Malaysia.
FNP services	Question 2: MCMC seeks public views for service provider portability to be considered for Fixed Number Portability implementation in Malaysia.
FNP services	Question 3: MCMC seeks public views on its proposal that service portability not to be considered for Fixed Number Portability implementation in Malaysia.
FNP services	Question 4: MCMC seeks comments on its proposal that location portability (within state boundaries) to be considered for Fixed Number Portability implementation in Malaysia.
Technical solutions	Question 5: MCMC seeks comment on its preliminary view that an All Call Query (ACQ) approach should be implemented, supported by a Centralised Number Portability Clearinghouse (NPC) utilising a Centralised Number Portability Database (NPDB).
Organisational approach	Question 6: MCMC seeks comment on its preliminary view that FNP should be deployed by upgrading and adapting the existing Number Portability Database (NPDB) developed for MNP, with the process overseen by a single database administrator for both FNP and MNP.
Establishment costs	<p>Question 7: MCMC seeks comment on its preliminary view that shared establishment costs should be recovered from service providers on the basis of cost recovery with costs allocated using a hybrid approach.</p> <p>MCMC seeks comment on its proposal to finalise the details of the cost allocation mechanism in consultation with industry through the formation of an industry working group</p>
Porting costs	Question 8: MCMC seeks comment on its preliminary view that service providers should be permitted to recover the administrative costs of porting through the levying of Donor Compensation and Porting Charge. Furthermore, MCMC seeks comment on its proposal to regulate the maximum level of such charges.
Porting process	Question 9: MCMC seeks comment on its proposal that the porting process is recipient-led.
Porting time	Question 10: MCMC seeks comment on its proposal to set the maximum regulated porting time for FNP.

Subject	Questions
Loss of service	Question 11: MCMC seeks comment on its proposal to regulate the maximum permissible time for loss of service during the porting process.
Porting restrictions	Question 12: MCMC seeks comment on its proposal that the acceptable reasons for rejecting a port request should be defined within the FNP regulations. Furthermore, MCMC seeks comment on its proposal to, where possible, harmonise the acceptable reasons for rejecting a port request between FNP and MNP.
Win-back	Question 13: MCMC seeks comment on its preliminary view that win-back (i.e. the practice of donor networks contacting customers for marketing purposes on receipt of a port request) should be prohibited.
Industry Working Group	Question 14: MCMC seeks comment on its intention to form an industry working group to finalise the details of the FNP guidelines.

B. TEMPLATE FOR RESPONSE

Please provide comments/responses in the Table below:

Question	Comments/Responses
1.	
2.	
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