SINGAPORE TELECOMMUNICATIONS LIMITED AND SINGAPORE TELECOM MOBILE PTE LIMITED

PUBLIC CONSULTATION ON THE REVIEW OF NUMBER PORTABILITY IN SINGAPORE

1. STATEMENT OF INTEREST AND STRUCTURE OF SUBMISSION

1.1 Singapore Telecommunications Limited and Singapore Telecom Mobile Pte Ltd (together **SingTel**) are licensed to provide telecommunications services in Singapore. SingTel is committed to the provision of state-of-the-art telecommunications technologies and services in Singapore. SingTel has a comprehensive portfolio of services that includes voice and data services over fixed, wireless and Internet platforms. SingTel services both corporate and residential customers and is committed to bringing the best of global communications to its customers in the Asia Pacific and beyond.

1.2 SingTel has a strong interest in the IDA's consultation paper entitled, *Public Consultation on the Review of Number Portability in Singapore* (**Consultation Paper**). As a provider of both fixed line and mobile services, SingTel has a strong interest in the development of an effective and cost efficient technical solution for Fixed Number Portability (**FNP**) and Mobile Number Portability (**MNP**).

1.3 SingTel has reviewed the Consultation Paper. SingTel's broad concerns in respect of the IDA's proposed centralised database solution for number portability include the following:

(a) the current extremely low levels of number portability does not warrant the significant costs involved in implementing a central database solution.

(b) the costs on operators to implement a centralised database solution for MNP and FNP will be significant – SingTel's set up costs alone will exceed the IDA's estimated costs. Other operators will also incur similar set up costs. In addition, there will be system wide set up costs and ongoing implementation costs that will have to be borne by operators and ultimately passed onto consumers;

(c) the benefits associated with a centralised database solution are questionable – there is no evidence to suggest that switching by consumers between service providers will increase following a change in the technical solution for porting numbers; and

(d) the costs associated with the implementation of a centralised database solution will be ultimately passed onto consumers – this will raise the costs of switching rather than decreasing them, thereby discouraging switching by customers rather than encouraging it.

(e) investment in a centralised database approach will result in stranded investment when operators in Singapore upgrade their existing to circuit based networks to "next-generation networks" – it would be prudent to delay changing the technical solution for number portability.

1.4 This submission has been divided into the following sections:

(a) Statement of Interest and Structure of Submission;

(b) Executive Summary;

(c) Part A – General Comments on Consultation Paper; and

(d) Part B – Response to questions put forward by the IDA in its Consultation Paper.

1.5 To the extent possible, SingTel has sought to respond to each of the questions posed by the IDA in its Consultation Paper.

1.6 SingTel has also provided the IDA with a commercial-in-confidence submission in response to the Consultation Paper.

2. EXECUTIVE SUMMARY

2.1 The main points made in SingTel's submission are as follows:

(a) The IDA has proposed the adoption of a centralised database solution to number portability in Singapore without performing a detailed and objective cost-benefit analysis. International best practice requires decisions by regulators to be founded on a proper evidentiary basis. The views expressed by the IDA in the Consultation Paper have no such basis. Any decision by the IDA to change the technical solution for FNP and MNP must be based on a comprehensive and objective cost-benefit analysis. The absence of any detailed cost-benefit analysis is conspicuous.

(b) A centralised database solution will result in operators incurring substantial set up and ongoing costs. SingTel's set up costs alone will exceed the IDA's estimated costs. Other operators will also incur similar set up costs. There will also be system wide

set up costs and ongoing implementation costs. These costs will have to be passed through to consumers and will not be offset by any benefits associated with the adoption of a centralised database. SingTel considers the adoption of a centralised database solution for FNP and MNP to be unnecessary. Such a solution will increase operators' costs to the ultimate detriment of consumers.

(c) The IDA has claimed that the cost of implementing a centralised database solution has fallen from S$100 million to S$10 million. The basis for such a statement is unclear. It appears, however, that the IDA has not taken account of the substantial set up and ongoing costs that each operator would incur within their own respective networks in order to be able to support a central database solution for FNP and MNP. These costs alone would exceed the amount claimed by the IDA.

(d) The existing technical solution for FNP and MNP is efficient, effective and robust. The extremely low levels of number portability in Singapore do not warrant the incurrence of the substantial set up and ongoing cost associated with a central database solution.

(e) The IDA has not produced any substantive evidence to justify changing the existing technical solution for the implementation of FNP and MNP. There is no evidence that a regulatory problem exists or that the existing technical solutions present barriers to switching by consumers.

(f) The existing technical solution for FNP and MNP supports basic services, including the porting of voice calls and SMS messages. The portability of new services should be addressed on a case-by-case basis, having regard to the importance of such services to consumers. The IDA has supported this approach previously and has provided no basis for a departure.

(g) The IDA has claimed that certain aspects of the current technical solution for MNP limit competition and switching by customers. This is not correct. The technical solution used to provide number portability merely facilitates switching by customers - it does not affect the level of switching that occurs. In nearly all instances, mobile customers will be completely unaware of the technical solution used to implement a port.

(h) Number portability is not a key driver of customer switching between service providers. Research conducted in Singapore and United States suggests that the ability of a customer to retain their telephone number will not always be a material issue in that person's decision to change service providers.

(i) Rather, switching levels are primarily determined by a customer's satisfaction with their existing service provider and the prospect of better service from other operators. A customer's decision to switch service providers is therefore primarily influenced by performance issues, such as the price of services, quality of network coverage and customer service. Number portability is not a cause of switching by customers – it is merely a mechanism by which customers can switch between operators.

(j) In addition to the above, evidence of customer switching in different countries suggests that porting rates are low regardless of the technical solution used to implement the port. Switching rates in Singapore are broadly comparable to switching rates in countries that have adopted a centralised database solution. The existing technical solution for FNP and MNP therefore has no impact on the propensity of consumers to port their numbers.

(k) Low levels of switching do not suggest there is a lack of competition or a problem in the porting process. The threat of switching by customers ensures that operators compete vigorously to preserve their market share and negate any inclination by customers to switch. Customer retention strategies are common in competitive markets and provide an effective means of negating the inclination of customers to switch service providers.

(l) A change to the technical solution for FNP and MNP is not warranted because of the introduction of WBA and IP based telephony services. These developments (and the needs of IP telephony and WBA providers) can be accommodated within the existing technical solution for FNP and MNP.

(m) There is no reason why IP telephony providers that hold level '6' numbers cannot adopt the existing FNP solution. IP telephony providers that hold level '3' numbers are Service Based Operators without access networks and should not be allowed to participate in the porting process, as they are not required to comply with the licensing obligations that apply to holders of level '6' numbers. The participation in the porting process of IP telephony providers that hold level '3' numbers will disadvantage consumers by raising the costs of porting and simultaneously depriving the ported customers of functionality traditionally associated with a level '6' number level.

(n) It is premature for the IDA to raise inter-modal porting as a justification for a centralised database solution. Whilst the IDA has not suggested that it will introduce inter-modal porting, SingTel would like to make it clear that inter-modal porting should not be introduced in Singapore. Inter-modal porting is likely to result in confusion amongst consumers in relation to the functionality and charging

arrangements that would apply to communications. The fact that a customer is technically able to retain a number for the purposes of inter-modal porting does not mean that the functionality associated with their original service can also be retained – the porting of a mobile number to a fixed line would remove the functionality originally associated with the mobile number, causing confusion amongst consumers. Inter-modal porting will result in consumers not being able to determine the applicable charging arrangements in respect of a call by simply looking at the relevant number level.

(o) There is no obvious advantage arising from the adoption of a centralised database solution for number portability. The existing technical solutions are effective, efficient and robust. There are also significant disadvantages associated with the adoption of a centralised database solution relative to the existing technical solutions, including very high costs and increased levels of complexity.

(p) Investments by operators to upgrade their existing circuit based networks to support a central database solution will become stranded following the rollout of 'next generation networks'. This is a critical matter in determining whether it is feasible to adopt a centralised database approach and has been recognised as such by overseas regulators. Ofcom in the United Kingdom has recently stated that the risk of stranded investment is a valid reason for delaying the implementation of a centralised database in respect of FNP.

(q) The IDA has confused the central database solution for FNP and MNP with a service platform. Further, operators already have their own service platforms in place and any attempt to build additional service functionality into a centralised database solution would further increase the costs associated with implementation. It appears that the IDA is seeking to expand the purpose for which a centralised database may be used in order to spread the costs of implementation and maintenance over a greater cross-section of the telecommunications sector. This appears to stem from the fact that the implementation costs for the purposes of number portability alone cannot be justified.

(r) Notwithstanding the fact that SingTel does not support a central database solution for FNP and MNP, a centralised database solution cannot be implemented in Singapore within 9 months. The IDA's time estimates are unrealistic and unachievable. The IDA appears not to appreciate the complexity associated with the implementation of a central database solution, as well the preliminary steps that must be undertaken prior to actual implementation. SingTel would expect implementation to take approximately 24 months.

3. PART A – GENERAL COMMENTS

No cost-benefit analysis

3.1 The IDA's Consultation Paper does not consider the costs or benefits associated with the adoption of a centralised database solution.

3.1.1 SingTel considers that the absence of detailed analysis (or an acknowledgement of the need to conduct such analysis in the future) is conspicuous.

3.1.2 In accordance with the principle of evidence based regulation, any decision to require a central database solution must be supported by a cost-benefit analysis. Clearly, it would be inappropriate for the IDA to direct operators to adopt a centralised database approach to number portability if the costs of doing so outweigh the benefits.

3.1.3 All best practice regulators have undertaken a comprehensive cost-benefit analysis before implementing number portability or instituting changes to existing number portability arrangements. Indeed, the implementation of number portability by regulators in Australia, Hong Kong, New Zealand and the United Kingdom has been premised on the outcome of a cost-benefit analysis. The IDA itself has previously undertaken cost-benefit analysis in respect of number portability on the basis that such analysis was needed to ensure that costs were not unnecessarily passed onto consumers.

> *"IDA acting chief executive Leong Keng Thai said his concern was that consumers would bear the costs related to implementing such a system.*
>
> *"I don't think that we will take that (Australia's) route because again if you prescribe that, ultimately it (the cost) ends up with the consumer…"*[1]

3.1.4 SingTel is concerned about the IDA's failure to identify a favourable cost-benefit analysis as a pre-condition to the adoption of a centralised database approach. Such an analysis is absolutely essential.

Costs of implementation are likely to exceed the benefits

3.2 The adoption of a centralised database approach ultimately harms consumers, as the costs would be passed on by operators. It is important for the IDA to realise that the

[1] The Straits Times, *Your phone's mobile, not the number*, 25 March 2002.

cost of adopting a centralised database solution will significantly outweigh the benefits.

3.2.1 A change in the technical solution to number portability will not increase switching between operators or increase competition more generally. SingTel has been unable to identify any benefit that would outweigh the significant costs associated with the adoption of a centralised database approach. In such a situation, it would be contrary to the interests of consumers to require number portability using a centralised database solution. As Vodafone has noted with respect to the introduction of MNP in Australia:

> *"we spent $50 million putting it in place and no-one is using it…*
>
> *"…our perspective is that it was regulator thinking rather than customer thinking…the bottom line is we spent $50 million and nothing's changed. It hasn't been a success from a competition perspective."*[2]

3.2.2 The IDA should therefore avoid mandating a technical solution without proper regard to the costs associated with doing so.

No evidence of market failure

3.3 The IDA has not made any valid or sustainable criticisms of the existing technical solutions for number portability. In particular, it has not provided any substantive evidence that the existing technical solution poses an impediment to switching amongst consumers or that such a solution restricts competition between service providers.

3.3.1 In doing so, the IDA has effectively proposed a technical solution to remedy a problem that either does not exist or which it has not adequately identified. This is contrary to the established principle that regulation is only required to remedy any market failure. Regulatory change is not necessary in the absence of market failure.

3.3.2 The IDA has not identified any market failure. There is no deficiency in competition in the provision of fixed or mobile services that can be resolved through the adoption of a centralised database solution.

3.3.3 Therefore, in the absence of evidence of any market failure, SingTel does not consider that it is appropriate to adopt a centralised database for FNP and MNP.

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[2] ZDNet Australia, *Australia's MNP a AU$50 million failure: Vodafone*, 25 September 2002.

PART B - RESPONSE TO SPECIFIC ISSUES RAISED BY THE IDA IN ITS CONSULTATION PAPER

1. TECHNOLOGICAL AND MARKET DEVELOPMENTS

IDA – Question 1

IDA has identified that developments in the info-communications sector, namely the development of technologies, increasing competition within the same markets, and fixed-to-mobile substitution, warrant a review of our existing number portability implementation for fixed and mobile services.

IDA welcomes views and comments on whether the existing number portability implementation for fixed and mobile services remains relevant and able to support future industry and market needs.

1.1 SingTel considers that the existing technical solutions for FNP and MNP remain relevant and are appropriate, notwithstanding recent developments in the telecommunications sector.

1.2 In respect to the emergence of new technologies, new technologies have not affected the relevance of the existing technical solutions for FNP and MNP. The emergence of IP telephony does not warrant the introduction of 'inter-modal' porting or a review of the existing technical solutions for number portability. IP telephony providers can be accommodated within the existing technical solution for FNP and MNP (discussed in detail in section 5 below).

1.3 The issue of fixed-to-mobile substitution is not relevant to whether there would be a change to the technical solution for FNP and MNP. The emergence of a degree of fixed-to-mobile substitution has not occurred recently as the IDA suggests. There has always been a degree of fixed-to-mobile substitution in Singapore. Substitutability of fixed-to-mobile services should not, in itself, provide a basis for 'inter-modal' porting or a review of the existing technical solutions for number portability. In fact, there are strong reasons against inter-modal porting (discussed in detail in section 3 below).

2. IDA'S ASSESSMENT OF THE 'SHORTCOMINGS' OF THE EXISTING MNP SOLUTION

IDA – Question 2

IDA notes that there are several shortcomings within the existing MNP solution. While the penetration rate is high in the mobile telecommunication market, IDA believes that these shortcomings need to be addresses so that the barriers to switching (with the MNP solution) will be lowered and end-users will further benefit from enhanced competition.

IDA welcomes views and comments on IDA's assessment of the shortcomings on the existing MNP solution. Are there other shortcomings that need to be addressed?

IDA also welcomes industry and in particular, consumers' feedback on their views and experience with the existing MNP services in Singapore. Specifically, IDA requests feedback on the following:

(i) ***Is the ability to retain your telephone number a critical consideration for switching from your current service provider to another service provider? What other factors would you consider before switching to another service provider?***

(ii) ***Have you considered obtaining MNP service when switching to another service provider but have been reluctant or discouraged from doing so? What are the reasons for not using MNP service?***

(iii) ***Do you think the existing MNP solution is adequate e.g. pricing, porting timeframes, settlement of outstanding charges and other performance experience? What aspects of the MNP solution could be improved upon?***

2.1 In this section, SingTel submits that:

(a) the issues identified by the IDA as 'shortcomings' in the existing MNP solution are not material issues – they do not affect switching by mobile customers;

(b) the extent of customer switching does not depend on the technical solution used by operators to implement MNP;

(c) a change in technical solution for MNP will not increase switching by mobile customers – rates of churn in Singapore are comparable to rates of churn in jurisdictions which use a centralised database for MNP;

(d) the fact that switching levels are low does not mean that there is no competition or that there is a glitch in the current technical solutions for MNP – in competitive markets, operators seek to retain customers by satisfying their expectations; and

(e) porting times and porting charges in Singapore are comparable to most other countries – current porting times and porting charges do not affect a customer's ability or inclination to switch.

Issues identified by the IDA do not constitute shortcomings in the existing MNP solution

2.2 In its Consultation Paper, the IDA has criticised the existing MNP solution on the basis that:

(a) the use of two (2) mobile numbers for the routing of calls under the call forwarding solution is inefficient;

(b) incorrect caller line identification (**CLI**) – the "CLI issue" - causes confusion and undermines the benefits of number portability; and

(c) the current solution cannot support the porting of multimedia (**MMS**) messages.[3]

2.3 The IDA has also stated that these alleged shortcomings do not provide a transparent and seamless porting experience for customers and that a new MNP solution is required to lower barriers to switching and encourage operators to be more innovative in their packaging of mobile services and to compete more aggressively.[4]

2.4 SingTel does not consider that the issues identified by the IDA with respect to the existing MNP solution constitute shortcomings. Nor do they affect the degree of switching or competition in respect of mobile services.

2.5 First, SingTel disagrees that the call forwarding solution results in an inefficient use of mobile numbers. The use of two mobile numbers for each ported number would

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[3] IDA, *Public Consultation on the review of number portability in Singapore*, 6 September 2005, paragraph 12.

[4] Ibid, paragraph 13.

only be inefficient if there was a supply shortage of mobile numbers. This is not the case.

2.6 SingTel notes that:

(a) the IDA's National Numbering Plan has identified that up to 18 million numbers are available for the provision of mobile, paging and trunk radio services in Singapore, out of which only about 10 million have been allocated to operators for the provision of services. SingTel also notes that the paging market is currently in a decline, and hence, numbers that were identified as available for paging services could in future be made available for mobile services.

(b) Even if the level of porting was to increase from the current low levels of porting experienced so far, there are more than sufficient amounts of numbers available to accommodate future growth in subscriptions.

2.7 Mobile numbers are therefore not scarce. As such, the allocation of two (2) numbers for each ported number under the existing technical solution does not result in an inefficient use of numbering resources.

2.8 Secondly, this "CLI issue" can be remedied through a 'technical fix'. A 'technical fix' will ensure that the CLI that is displayed on a recipient's phone is the original mobile number of the caller. SingTel has already proposed in the Mobile Number Portability Working Group (**MNPWG**) that this issue be remedied. In fact, technical solutions have been proposed that can go towards resolving the CLI issue. SingTel supports the development of a 'technical fix' to resolve this issue.

2.9 SingTel does not therefore consider the "CLI issue" to be an insurmountable issue. The IDA should not use the "CLI issue" as a basis for arguing that operators should change to the entire technical solution for MNP, particularly where a 'technical fix' within the existing solution is available to resolve such an issue.

2.10 Finally, SingTel does not consider that the current inability to port MMS messages and other IP based services (e.g. Push to Talk) represents a barrier to switching amongst consumers. MMS messaging is not currently an important feature of mobile services from a consumer perspective. The current inability to port MMS messages is unlikely to affect switching between operators.

2.11 The volume of MMS messages as a total proportion of SMS and MMS messages are extremely low.

2.12 MMS messages have consistently accounted for an extremely low volume of all messages generated on SingTel's network. The level of MMS traffic on StarHub and M1 also appears very low as a proportion of total SMS and MMS messages.[5]

2.13 A high number of mobile subscribers do not use MMS messaging. MMS messaging is unlikely to be an issue for the overwhelming majority of mobile customers and therefore not an impediment to switching by these subscribers.

2.14 SingTel does not believe that the current inability to port MMS messages is an obstacle to switching. Research conducted by SingTel in 2003 revealed that the switching disposition of consumers did not change appreciably with the introduction of SMS portability. Statistics on the volume of SingTel Mobile customers porting to other operators with the introduction of SMS portability also show that there was no appreciable or direct increase in porting as a result of SMS portability.

2.15 SingTel considers that the overall findings would be readily applicable to the switching propensity of customers with respect to MMS messaging. In fact, the minor differences identified in respect of SMS portability may not even arise with respect to MMS messages, as MMS messages are unlikely to have the same utility to customers as SMS messages.

2.16 The MNPWG is the appropriate forum to deal with the porting of MMS messages and related matters. The IDA should not use the inability to port MMS messages as a basis for changing the entire technical solution for MNP.

2.17 SingTel does not consider that it is necessary to change the entire technical solution for MNP to address the issues raised above. These matters will be resolved in due course through the MNPWG.

2.18 On the other hand, jurisdictions that have implemented a database solution have seen complaints, for example, in Australia and the United States, where MNP is implemented through an individual and centralised database solution respectively.[6]

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5 StarHub, *2Q-2005 Results: Presentation*, 3 August 2005, page 17, www.starhub.com; M1, *1H05 Results Presentation*, July 2005, page 14, www.m1.com.sg.

6 Telecommunications Industry Ombudsman, *Quarterly Complaints Statistics*, March 2005. FCC, *Wireless Portability Complaints: Approximately 7,040 consumer complaints since began on Nov 24*, News Release, 29 April 2004.

The extent of customer switching does not depend on the technical solution used to implement MNP

2.19 The IDA's comments in respect of the alleged shortcomings of the existing MNP solution suggest that a new MNP solution is required to increase switching by customers and enhance competition between operators.

2.20 SingTel does not agree with this submission. Mobile services in Singapore are already highly competitive. This is demonstrated by the fact that mobile phone penetration is currently at 98.1 percent.[7] Intense competition for mobile customers between SingTel, StarHub and M1 has resulted in unprecedented demand for mobile services by customers and the development of new and innovative mobile packages and services.

2.21 MNP provides the mechanism that enables switching between operators. The technical solution used to provide MNP does not have a bearing on rates of switching, it merely facilitates it. As a Marta Munoz of Ovum has noted, "the option to port one's number is a bonus, rather than a reason to churn".[8] In nearly all instances, mobile customers will be completely unaware of the technical solution used to provide MNP.

2.22 The IDA has incorrectly assumed that changing the technical solution for MNP will encourage further switching. This view is contrary to the evidence of switching in other countries. Evidence of customer switching in different countries suggests that, apart from a minor rise in the 12 months immediately following the introduction of MNP, porting rates are generally low regardless of the technical solution used to implement the port.

2.23 The technical solution used to implement ports and the relative porting rates in various countries is set out in Table 2 below.

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7 IDA, *Statistics on Telecom Services for 2005 (Jul-Dec)*, www.ida.gov.sg

8 Quoted in The Economist, *Much ado about porting*, 27 November 2003.

Table 2 – Mobile porting rates in different countries.

Country	Technical Solution	Porting rate (approx)
Australia[9]	Individual database	3.5%
Germany[10]	Centralised database	2%
Netherlands[11]	Centralised database	2.6%
Singapore	Call Forwarding	2% - 3% (estimated)
United Kingdom[12]	Call Forwarding	1.8%

2.24 These figures suggest that the willingness of a customer to switch will not depend on the technical solution used by operators to implement the switch. These findings are not surprising. In practice, the rate of switching is likely to depend on a variety of factors that are unrelated to the method by which a port is implemented. These factors are discussed below.

Switching decisions are primarily influenced by their satisfaction with customers' existing service provider

2.25 The IDA has requested submissions on whether the ability to retain a telephone number is a critical consideration in decisions by consumers to change their service providers. It has also requested comments on what other factors a customer would consider before switching to another service provider.

9 Australian Communications Authority, *Telecommunications Performance Report 2003-04*, 2004. Porting rates have been obtained by multiplying the number of ports for FY 2003-04 by the total number of mobile subscribers for the same period.

10 Ovum, 2004.

11 Ibid.

12 Ibid.

2.26 The ability of a customer to keep their existing mobile number will not always be a material issue in that person's decision to change service providers. Number retention is clearly not the deciding factor nor is it material in a person's decision to switch service providers, rather, service quality, price plans, rates and freebies were quoted and ranked as the top 3-4 key factors that would be considered in a person's decision to switch providers.

2.27 Similar data also exists in the United States, where a recent survey of 2,700 mobile customers reveals that 48% of those surveyed would not be more likely to switch providers if they could retain their mobile number.

2.28 Such research shows that a large proportion of consumers will switch service providers regardless of whether they can keep their mobile numbers.

2.29 The primary reason for switching amongst customers is dissatisfaction with their existing mobile subscription plans and the possibility of better service from another service provider. The following issues are likely to affect a customer's decision to change service providers:

(a) price of services;

(b) network coverage and reliability;

(c) types of value added services offered (e.g. GPRS);

(d) types of handsets offered;

(e) customer service and responsiveness; and

(f) other issues.

2.30 The ability of operators to maintain customers in a competitive environment depends on their ability to consistently meet customers' expectations. This view is confirmed by research conducted by Syniverse Technologies into number portability in various countries:

> *"In several countries where MNP implementation took place, analysts predicted that churn would 'go through the roof'. This prediction never materialised. NP does not cause churn; rather the impact of portability only exaggerates existing reasons to churn – clear quality issues, holes in coverage, better data services, availability of more exciting handsets.*

…

"Furthermore, churn in the U.S. varied widely by operator. Just as in other countries, operators who developed strategies around loyalty, service improvements, improved network quality, and better customer service, saw churn actually decrease despite the implementation of number portability, while other operators had significant increases in churn".[13]

2.31 Similar views have been expressed by representatives of the Federal Communications Commission in the United States:

"…I find little recorded support for the conclusion that consumers would readily prefer [wireless] LNP to better coverage, lower prices or more innovation services"[14]

2.32 Given that switching between operators is likely to depend on the level of customer satisfaction with their existing mobile provider, low levels of switching may be attributable to a level of customer satisfaction that negates the inclination to switch. The lack of actual switching does not suggest that there is insufficient competition or an issue associated with the porting process.

2.33 Customer retention strategies are common in competitive markets – operators will seek to meet the expectations of their existing customers out of the fear of losing that customer to rivals. This is the hallmark of competition and is reflected in the Singapore mobile market. The fact that switching levels are low does not suggest that there is no competition between operators.

2.34 The mere threat of switching by customers will result in operators competing vigorously to preserve their market share, notwithstanding the fact that such rivalry does not result in actual switching by customers. As the New Zealand Commerce Commission has stated:

"The pro-competitive effect of number portability may not be reflected in high switching rates. For example, because number portability facilitates switching, operators may lower prices, improve their quality of service, and expand the range of services offered. To the extent that they do so, switching

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13 Syniverse Technologies, *A Global Perspective on Number Portability*, May 2004, page 17.

14 Statement of Commissioner Abernathy, *Memorandum Opinion and Order*, CC Docket No. 95-116, 16 July 2002.

rates may not increase dramatically following the introduction of number portability."[15]

2.35 This view is also supported by the fact that the degree of switching varies between operators. Different levels of churn suggest that competitive performance and the degree of customer satisfaction varies between operators. In Singapore, rates of churn vary moderately between operators, suggesting that the reasons for churn may be operator specific. As at 30 June 2005:

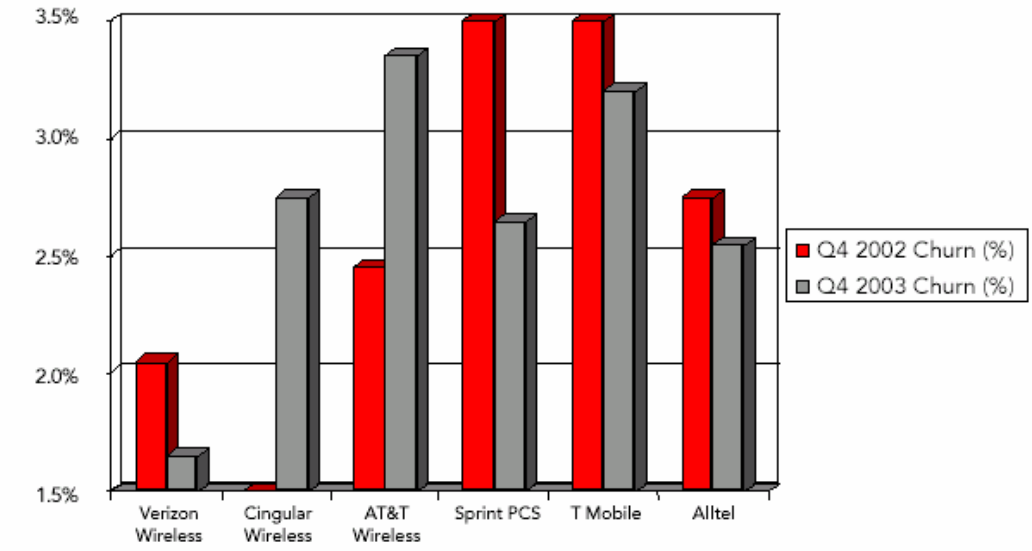
(a) M1 had a churn rate of 1.6%;[16]

(b) SingTel had a churn rate of 1.2%;[17] and

(c) StarHub had a churn rate of 0.9%.[18]

2.36 Similar evidence can be found in other countries. As the chart below demonstrates, customer churn also varies moderately between operators in the United States (but ultimately remains low).[19]

U.S. Mobile Operator Monthly Churn



Source: iGillottResearch

15 Commerce Commission, *Determination on the multi-party application for determination of 'local telephone number portability service' and 'cellular telephone number portability service' designated multi network services*, 31 August 2005, paragraph 71, www.comcom.govt.nz

16 M1, *1H05 Results Presentation*, July 2005, page 11, www.m1.com.sg

17 SingTel, *Management Discussion and Analysis of unaudited financial condition, results of operations and cash flows for the first quarter ended 30 June 2005*, page 19, www.singtel.com

18 StarHub, 2Q-2005 Results: Presentation, 3 August 2005, page 18, www.starhub.com

19 Quoted in Syniverse Technologies, *A Global Perspective on Number Portability*, May 2004, page 17.

(a) the willingness of customers to change service providers will not always depend on their ability keep their existing telephone number;

(b) switching by customers is more likely to be influenced by the performance of their existing service provider with respect to issues such as price, network coverage and value added services;

(c) number portability is not the cause of switching, rather it is a mechanism that facilitates switching;

(d) low levels of switching do not suggest there is no competition or a problem in the porting process – the threat of switching by customers ensures that operates compete vigorous to preserve their market share, notwithstanding an absence of actual switching by customers; and

(e) in any case, levels of switching in Singapore are broadly comparable to rates in other countries.

Existing MNP solution is adequate

2.37 The IDA has requested views on whether the existing MNP solution is adequate with respect to matters such as price, porting times and other related issues.

2.38 SingTel considers that the costs of porting and the time taken to effect a port are reasonable. In particular, SingTel does not believe the costs of porting or the time taken to effect a port prevent or reduce the likelihood of switching by customers.

2.39 The cost of porting and the time taken to effect a port in Singapore are comparable with those that exist in other countries. SingTel does not consider that the costs of porting or the time taken to implement a port in Singapore will result in a customer refraining from, or being less likely to, switch operators.

2.40 As Table 3 and 4 demonstrate, porting costs and the time taken to implement ports in Singapore are broadly comparable to (and in some case better than) those in other jurisdictions.

Table 3 – Customer porting charges in different jurisdictions

Country	Customer Porting Charges (one-off) ($US PPP)	$US PPP exchange rate (2004)[20]
Australia[21]	$5.59	1.432
Germany[22]	$25.50	0.941
Hong Kong[23]	$0.38 plus a dipping charge of $0.08 per call	6.548
Netherlands[24]	$0 – $8.89	1.012
Singapore[25]	$0 - $13.37	1.571
United Kingdom[26]	$14.31 - $42.92	0.699

Table 4 – Mobile porting times in different jurisdictions

Country	Time taken to effect port
Australia[27]	90% within 3 hours, 99% within 2 business days
Germany[28]	4 working days + 2 further days

20 Based on the PPP US dollar exchange rates for 2004. See, International Monetary Fund, *World Economic Outlook Database*.

21 Telstra Mobile, *Customer Terms: Part A – General*, 4 May 2005, http://www.telstra.com.au/customerterms/docs/mobilegeneral.doc

22 Ovum, 2004.

23 OFTA, *Charges for Mobile Number Portability (MNP), Porting Activity Service and Database Interrogation Service (Dipping) operated by PCCW-HKT Telephone Limited: Statement of the Telecommunications Authority of Hong Kong, 30 May 2002*, www.ofta.gov.hk

24 Ovum, 2004.

25 Nominal one-time charges could be as high as S$20. SingTel Mobile currently does not levy the one-time charge.

26 Ovum, 2004.

27 Australian Communications Industry Forum, *Industry Code: Mobile Number Portability*, ACIF C570: 2003, August 2003, section 6.6.

28 Electronic Communications Committee within the European Conference of Postal and Telecommunications Administrations, *Implementation of Mobile Number Portability in CEPT Countries*, ECC Report 31, March 2003, page 13

Italy[29]	10 days
France[30]	30 days
Hong Kong[31]	1 – 2 days
Netherlands[32]	4 - 60 days
Norway[33]	6.5 days
Singapore	7 days
United Kingdom[34]	5 days

The IDA will create a barrier to switching where none currently exists

2.41 The IDA has incorrectly assumed that the current technical solution for MNP is the cause of low levels of porting in Singapore. The IDA has also incorrectly assumed that the introduction of a centralised database will result in increased levels of porting.

2.42 These assumptions have no factual basis. SingTel is not aware of evidence anywhere in the world to suggest that a customer's decision to port a number is influenced by the technical solution used to implement the port. It cannot be reasonably suggested that a consumer would refrain from porting unless they were permitted to do so through a centralised database solution. As noted above, customer is unlikely to be aware of the technical aspects of the porting process.

2.43 The only relevance of the technical solution to the propensity of a customer to switch service providers is the relationship between the solution and the cost of porting to the customer. If the IDA mandates a technical solution that is not feasible from a cost-benefit perspective, operators would be forced to pass such costs to consumers thereby reducing the propensity of consumers to switch because of high costs

29 Ibid, page 13.
30 Ibid, page 13.
31 http://www.ofta.gov.hk/en/ca_bd/mnp.html
32 Ovum, 2004.
33 Electronic Communications Committee within the European Conference of Postal and Telecommunications Administrations, *Implementation of Mobile Number Portability in CEPT Countries*, ECC Report 31, March 2003, page 13.
34 Ovum, 2004.

associating with doing so. Therefore, the IDA's mandating of a centralised database solution will create barriers to switching.

2.44 No such switching barrier currently exists in Singapore. However, should the IDA insist on an uneconomic and unnecessary centralised database approach it will actually create a barrier to switching. This is because a centralised database will be so costly to implement that operators would be forced to recover their costs from consumers.

2.45 SingTel is concerned that the Consultation Paper does not provide any analysis of the likely costs to consumers that will result from the introduction of a centralised database. Consumers should be made aware of the full implications of the IDA's proposed changes to the technical solution for number portability.

No basis for the IDA's assertions

2.46 The IDA does not have any evidence that consumers' desire to use MNP will increase with a change in the technical solution. SingTel notes that the IDA has included a series of 3 leading questions at Question 2 of the Consultation Paper, with the aim of extracting consumer views to support a change to a centralised database solution.

2.47 SingTel's view is that these questions have no qualitative or quantitative rigour. Answers to these questions cannot be relied on as evidence to support any regulatory decision-making. As SingTel continually advocates in this submission, any decision to alter the current regulatory requirements for number portability must be based on a rigorous cost-benefit analysis.

2.48 The IDA should not rely on 3 leading questions that are designed to produce a particular answer as the basis for the adoption of a centralised database solution.

3. ENTRY OF IP TELEPHONY AND WIRELESS BROADBAND ACCESS ON THE EXISTING FNP IMPLEMENTATION

IDA – Question 3

IDA welcomes views and comments on the impact of the entry of IP Telephony and WBA players on the existing FNP implementation. Will the FNP solution be able to support these players effectively? What are the areas that IDA needs to consider and address in the FNP implementation?

3.1 In its Consultation Paper, the IDA has requested comments about the impact of IP telephony and WBA on the existing technical solution for FNP. It has also requested comments on whether the existing solution will be able to support these players effectively.

3.2 SingTel considers that providers of IP telephony and WBA that offer fixed voice services should be required to adopt the existing FNP solution. The existing FNP solution will be able to support the participation of these players in the provision of fixed services. This has been recognized by the IDA.

3.3 As the IDA is aware, the call routing algorithm built into the intelligent networks of SingTel and StarHub are able to satisfy the porting needs of fixed line customers through a Query on Release (**QoR**) technique. SingTel and StarHub have incurred considerable costs in configuring their respective networks in order to provide for FNP using this solution.

3.4 SingTel considers that the existing FNP solution will be able to support providers of IP telephony and WBA services. As such, these providers should adopt the existing FNP solution if they wish to make porting available to their customers.

3.5 SingTel and StarHub should not be required to modify the technical solution for FNP (and incur substantial costs in doing so) in order to accommodate the needs of IP telephony and WBA providers.

3.6 Further, SingTel considers that the IDA should have regard to the principle of equivalency. A provider of IP telephony should only be allowed to make porting available to their customers if it has obtained a level '6' number. IP telephony providers with level '3' numbers should not be allowed to participate in the FNP solution, as they are not required to comply with the stringent licensing requirements that apply to the provision of PSTN and IP telephony services by level '6' number holders. This will ensure that IP telephony providers are subject to equivalent obligations as those faced by SingTel and StarHub.

4. USE OF A CENTRALISED DATABASE APPROACH IN IMPLEMENTING NUMBER PORTABILITY AND DIRECT ROUTING/ACQ FOR ROUTING CALLS

IDA – Question 4

IDA has identified various areas for review with regard to the existing number portability implementation. These include administrative arrangements, technical solutions and commercial arrangements. IDA notes that a centralised database approach has been adopted in many countries due to benefits it offers. IDA also notes that with respect to the technical routing solutions, the Direct Routing/ACQ method has been adopted as the preferred method, as it provides a long-term, optimised call routing solution.

IDA welcomes views and comments on the use of a centralised database approach in implementing number portability and the Direct Routing/ACQ for routing calls. Specifically, IDA welcomes views and comments on the following:

(i) ***the advantages and disadvantages of implementing number portability using a centralised database approach;***

(ii) ***should the centralised database be run by the operators (e.g. a consortium of the operators) or by an independent and neutral party (e.g. a third party vendor)? What are the pros and cons of each option identified or proposed?***

(iii) ***The likely cost components and cost estimates in implementing a centralised database in Singapore? What are the commercial or charging arrangements that can be considered when implementing a centralised database, e.g., should the charges be apportioned or recovered from operators based on equal sharing, usage, market share etc? What are the pros and cons of each of these options identified?***

(iv) ***What are the pros and cons of Direct Routing/ACQ versus Indirect Routing? What issues an factors need to be considered in deciding which method to adopt? What are the likely cost components and estimates in implementing a Direct Routing/ACQ in an operator's network?***

(v) ***What impact would the use of centralised database and change in technical routing solutions have on other industry players, such as the mobile content and application service providers? IDA notes that currently some mobile content and application providers rely on the phone number N1 (the ported***

customer's original phone number in the Donor Network) and N2 (the new phone number assigned to the ported customer in the Recipient Network) of a ported customer for proper authentication and billing purposes. Will mobile content and application providers benefit form a centralised database approach?

(vi) What is the impact on downstream markets, e.g. telecom equipment dealers and existing ported customers? If so, who are the affected parties and what are these impact?

(vii) ***Are there other implementation issues IDA should consider in its number portability review?***

4.1 In this section, SingTel submits that:

(a) a centralised database:

(i) does not have any clear advantages relative to the existing technical solutions for FNP and MNP, which are both efficient, effective and robust; and

(ii) is problematic in several respects – it is very expensive, highly complex and increases regulatory risk. It also requires operators to upgrade their infrastructure, thereby creating the risk of stranded investment;

(b) in determining whether to implement a centralised database, the IDA must consider the costs and benefits associated with adopting such a solution;

(c) SingTel's view is that the costs associated with a centralised database are likely to exceed the benefits (if any);

(d) the costs associated with the adoption of a centralised database include the following components:

(i) operator specific set up costs;

(ii) common industry set up costs;

(iii) per line set up costs; and

(iv) additional call conveyance costs

(e) based on SingTel's estimates, operator specific set up costs are likely to be substantial; and

(f) the benefits of establishing a centralised database are likely to be low in light of:

(i) the fact that the existing technical solution already provides an effective solution for porting;

(ii) the fact that switching (or competition more generally) will not increase upon adoption of a centralised database; and

(iii) the fact that costs associated with the implementation of a technical solution are fixed while the benefits are dependent on the number of subscribers – in a small country such as Singapore, it would be very difficult to conclude that the benefits of implementing a centralised database solution for number portability will offset the costs of implementation.

Advantages and disadvantages associated with a centralised database solution

4.2 The IDA has requested comments on the advantages and disadvantages associated with using a centralised database.

4.3 SingTel does not consider that a centralised database presents any real advantages relative to the existing technical solutions for FNP and MNP.

4.4 SingTel has demonstrated already that competition will not be enhanced through the adoption of a centralised database. The existing technical solutions for FNP and MNP already facilitate switching between operators. Switching rates are not dependent on the technical solution used to implement number portability. If a customer is dissatisfied with their existing service provider there is nothing within the existing technical solutions for FNP and MNP that prevent them from switching. As such, SingTel does not consider that there any clear advantages associated with a centralised database approach relative to the existing technical solutions.

4.5 In addition, SingTel believes that there are various problems or shortcomings associated with the adoption of a centralised database, including the following:

(a) centralised databases are expensive – the adoption of a centralised database imposes several categories of costs, including system wide and operator specific set up costs,

per line set up costs and call conveyance costs. The costs associated with establishing and maintaining a centralised database are likely to outweigh the benefits associated with its adoption (discussed in more detail below);

(b) centralised databases are very complicated relative to the existing technical solution – centralised databases introduce a high level of complexity into porting arrangements, as they require higher levels of interaction and standardisation across different networks. For example, in order to operate a centralised database:

(i) an SSP function must be installed in originating exchanges;

(ii) communication protocols must be standardised amongst service providers;

(iii) the database will require regular reconciliation and backup to prevent system error;

(iv) operators will have to establish their own databases to interact with the centralised database; and

(v) CPs and ASPs will need to enter into arrangements with the database operator.

(c) centralised databases impose additional regulatory requirements – as a centralised database is the 'core' of number portability arrangements, a high level of regulation required to ensure the proper functioning of the porting process;

(d) centralised databases provide a single point of failure – the financial failure of the database operator or an incident in respect of a centralised database may have implications for the entire porting process.

4.6 On this basis, SingTel is concerned that the adoption of a centralised database approach does not present any real advantages when considered in light of:

(a) the effectiveness of the existing technical solution;

(b) the extremely low levels of porting within Singapore; and

(c) the numerous issues that are likely to be associated with the adoption of a centralised database.

The adoption of a centralised database must be supported by cost-benefit analysis

4.7 The IDA has requested comments on the likely cost components and cost estimates in implementing a centralised database in Singapore. SingTel welcomes the fact that the IDA is conscious of the costs associated with the implementation of a centralised database.

4.8 As indicated earlier in this submission, any decision by the IDA to modify the current technical solutions must be supported by cost-benefit analysis. It will make little economic sense to adopt a centralised database approach if the costs outweigh the benefits. A cost-benefit analysis is required to substantiate the IDA's arguments for modifying the existing technical solutions. This is consistent with international best practice and the principle of evidence based regulation.

4.9 Regulators in the United Kingdom and New Zealand have recently undertaken a review of number portability in their respective jurisdictions using cost-benefit analysis. Ofcom is currently considering whether the existing call forward solution for MNP should be replaced with a centralised database solution. The decision to adopt a centralised database is "subject to the satisfactory outcome of a Regulatory Impact Appraisal (**RIAs**), which it has explained as follows:

> *"RIAs provide a valuable way of assessing different options for regulation and showing why options were chosen or rejected. They form part of best practice policy-making and are commonly used by other regulators.*
>
> …
>
> *The key objectives of this RIA are to identify the costs and benefits of introducing a CDB system for number portability. The potential net efficiency benefits and the extent of any benefits associated with safeguarding the number of customers of failed access networks are considered and compared with the costs of introducing and running a CDB solution".*[35]

4.10 SingTel considers that the IDA should adopt a similar approach in its review of number portability. Such an approach is consistent with international best practice and will ensure that any decision to change the technical solution for FNP and MNP is founded on a strong evidentiary basis.

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[35] Ofcom, *An assessment of alternative solutions for UK number portability: A consultation document issued by Ofcom*¸ 26 August 2004, pages 10 and 11.

Costs components associated with the adoption of a centralised database approach

4.11 SingTel's view is that the costs of implementing a centralised database solution for number portability are likely to significantly outweigh the benefits. SingTel's view has been informed by its review of the implementation of number portability via a centralised database in other jurisdictions. It is clear that the costs of establishing and maintaining a centralised database will be very high relative to the benefits.

4.12 SingTel considers that the cost components identified by the New Zealand Commerce Commission (**NZCC**) provide a reasonable starting point. The NZCC has identified the following cost components:[36]

(a) industry common system costs – costs associated with developing the technical specifications for and the design and build of the centralised database and other common systems. These costs also include implementation and ongoing management services;

(b) per operator set up costs – costs incurred by an operator in developing its network to provide number portability, including the costs of establishing and maintaining routing databases, upgrading network switches, modifying existing software and building and operating links to access the centralised database;

(c) per line set up costs – incremental costs that are efficiently incurred when customers port their number from one operator to another, including the costs associated with modifying customer data in corresponding databases. These costs are usually incurred by the Donor Network Operator (**DNO**); and

(d) additional call conveyance costs – additional costs incurred by the originating operator as a result of the processing and routing of calls to numbers which have been ported, which are above the costs of processing and routing a call to a non-ported number.

4.13 SingTel broadly agrees with the cost components identified by the Commerce Commission, and considers that these provide a reasonable basis for the IDA's

[36] Commerce Commission, *Determination on the multi-party application for determination of 'local telephone number portability service' and 'cellular telephone number portability service' designated multi network services*, 31 August 2005, paragraphs 52-57, www.comcom.govt.nz

analysis of the costs that will be associated with the adoption of a centralised database.[37]

4.14 Indeed, similar conclusions were reached by Ofcom in a recent review into the viability of retaining the call forwarding solution for FNP. In response to the collapse of Atlantic Telecom in 2001 (which resulted in 14,000 customers losing their original numbers due to the indirect call forwarding solution for FNP), Ofcom undertook a review to determine whether the existing solution should be replaced with a centralised database solution utilizing ACQ/direct routing. Following a cost-benefit analysis, Ofcom concluded that the costs associated with moving to a centralised database approach are disproportionate to the benefits. It stated:

> *"There are several benefits of moving to an Intelligent Network (IN) based CDB solution for number portability. These include lowering any costs to consumers caused as a result of network failure (such as those which arose when Atlantic Telecom failed) and efficiency gains in the conveyance of calls to ported numbers. But the assessment, looking over a ten year period, shows that only where extreme assumptions are used in the modelling can costs be shown to be offset by the benefits. Core assumptions show the net cost, of what is probably the most viable of the options explored in this document, the All Call Query (ACQ) solution…to be £200.6 million. Some 70 similar incidents like the Atlantic failure would be required to recoup this scale of cost. The benefits do not appear to offset the significant costs of setting up and running such a solution using currently deployed circuit-switched network technology" (our emphasis).*[38]

Per operator set up costs are likely to be high

4.15 SingTel has estimated the set up costs it is likely to incur if the IDA requires a centralised database for FNP and MNP. These costs exceed the estimates given by the IDA.

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37 For the avoidance of doubt, SingTel reserves the right to suggest an alternative method of identifying cost components if this matter is subject to further consideration by the IDA.

38 Ofcom, *An assessment of alternative solutions for UK number portability: A consultation document issued by Ofcom*, 26 August 2004, pages 3-4.

4.16 The adoption of a centralised database will require wholesale changes to many aspects of an operator's business. As Syniverse Technologies has noted, it is reasonable for these costs to be included as operator specific costs:

> *"MNP does not just impact billing systems and network elements, although these two areas are the most affected. Operators need to consider every aspect of their business, and assess what changes are necessary to those systems. In some cases, the billing and network vendors need to be contacted for NP-compliant upgrades; in some cases in-house development staff or out-sourced consultants need to be augmented to deal with modifications and enhancements to make NP successful.*
>
> - *A brief list of systems and components that need to be assessed include:*
> - *HLRs, VLRs, and SMSCs*
> - *Billing systems, point of sale systems, activation and provisioning systems*
> - *Directory assistance, operator services emergency services (e.g. 911, fire, police)*
> - *Caller ID, LIDB, voice mail, prepaid*
> - *Roaming systems and fraud system".* [39]

4.17 On the basis of the above, SingTel considers that its operator set up costs are likely to be very high. Operator specific set up costs alone are therefore likely to significantly exceed the $10 million estimated by the IDA as the cost of implementing a centralised database solution.

IDA should have regard to the costs of stranded investment

4.18 The requirement for operators to implement a centralised database solution at this point in time will result in stranded investment. When the IDA considers the costs associated with the adoption of a centralised database, it should have regard to the fact that operators (including SingTel) will begin a process of phasing in IP based networks (i.e. 'next generation network' or NGN) to replace their existing circuit switched networks.

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[39] Syniverse Technologies, *A Global Perspective on Number Portability*, May 2004, page 21.

4.19 Investment in existing networks to support a centralised database for FNP and MNP will become redundant in the NGN context. A decision by the IDA requiring operators to implement a centralised database solution on their existing networks would therefore be pointless.

4.20 More importantly, any investment undertaken by operators to implement a centralised database solution on their existing networks will become stranded. This would constitute an unreasonable imposition on operators.

4.21 As Ofcom has correctly stated:

> *"Development in next generation networks over the next five to ten years offers an opportunity to migrate to a new solution for number portability (a CDB approach). But investment in current [legacy] network infrastructure now risks assets being stranded and made obsolete in only a few years.*
>
> …
>
> *"…a solution to the number portability problem may emerge as a side effect of a more general solution to address resolution problems associated with NGNs. Major changes to existing network architectures will be required to support such concepts as mobility and personalisation, and it is reasonable to suppose that these might also result in an improved mechanism for implementing number portability" (our emphasis)".*[40]

On this basis, SingTel believes that it makes little or no economic sense to require the adoption of a centralised database solution at this point in time. Any cost-benefit analysis that is conducted would undoubtedly conclude that the costs associated with structural investment would completely offset the benefits of the adoption of a centralised database.

Benefits associated with the adoption of a centralised database approach

4.22 SingTel has noted above that the costs associated with the implementation of a centralised database are likely to be significant. SingTel considers that these costs are likely to outweigh the benefits associated with a centralised database. This is because there are unlikely to be any appreciable benefits arising from the adoption of a centralised database approach.

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[40] Ofcom, *An assessment of alternative solutions for UK number portability: A consultation document issued by Ofcom*, 26 August 2004, pages 4 and 31.

4.23 Throughout the Consultation Paper, the IDA has referred to the apparent benefits arising from the adoption of a centralised database. SingTel is concerned, however, that the IDA has failed to establish a proper framework to calculate or measure these benefits. The IDA's Consultation Paper does not indicate how it intends to quantify such benefits. The IDA's number portability requirements set out in Annex 3 of the Consultation Paper do not provide sufficient guidance on this issue.

4.24 International best practice, as evidenced by Ofcom[41], OFTA[42] and the NZCC[43], categorises benefits as follows:

(a) Type 1 benefits – benefits accruing to customers who port their numbers (e.g. price, quality and features provided by the competing service provider);

(b) Type 2 benefits – efficiency improvements, price reductions and greater consumer choice resulting from increased competitive pressure stemming from the introduction of number portability; and

(c) Type 3 benefits – convenience and cost savings enjoyed by all users as a result of fewer numbers being changed (e.g. fewer misdialed numbers, directory enquiry calls and changes to information stored in a customer's handset).

4.25 Based on this approach, there is no evidence that the adoption of a centralised database solution in Singapore will result in any appreciable Type 1, 2 or 3 benefits. SingTel does not consider that any of these benefits will arise following the adoption of a centralised database.

Interaction of costs vs benefits in small countries

4.26 SingTel notes that the benefits associated with the adoption of a centralised database solution for number portability are likely to be highly limited in countries with small populations, such as Singapore. This is primarily because the benefits associated with number portability usually depend on the number of subscribers.

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41 Ibid, pages 13-15.

42 NERA & Smith System Engineering, *Feasibility Study and Cost Benefit Analysis of Number Portability for Mobile Services in Hong Kong: A report for OFTA*, 1998.

43 Commerce Commission, *Determination on the multi-party application for determination of 'local telephone number portability service' and 'cellular telephone number portability service' designated multi network services*, 31 August 2005, paragraph 72, www.comcom.govt.nz

4.27 Indeed, the world's largest mobile telephony provider, Vodafone Group plc, has consistently argued that number portability is not viable in small countries.[44] SingTel agrees with this assertion.

4.28 This is because:

(a) operator and system set up costs are fixed costs. They must be incurred irrespective of whether customers port their numbers. These costs are broadly similar in different countries, as most of these costs are not dependent on the number of porting customers; and

(b) benefits accruing from number portability are likely to be proportionate to the number of ports, which in turn is related to the size of a country's subscriber base.

4.29 As such, it is highly unlikely that the benefits associated with the adoption of a centralised database approach would outweigh the costs in countries such as Singapore.

4.30 Singapore has a relatively small subscriber base relative to other countries where number portability has been introduced. This has implications for the outcome of any cost-benefit analysis that is undertaken. The costs incurred in adopting a centralised database solution are likely to be very high in Singapore because the potential for offsetting benefits based on the number of ports is likely to be less.

Commercial arrangements

4.31 The IDA has requested views on the commercial or charging arrangements that should apply if a centralised database is implemented.

4.32 As noted above, SingTel does not consider that the technical solution for FNP or MNP should be changed. SingTel believes that the existing technical solution for FNP and MNP is the most efficient solution for Singapore. SingTel has stated above that it considers that the costs associated with the adoption of a centralised database are likely to outweigh the benefits.

4.33 A consideration of the structure of potential charging arrangements would only be required if a cost-benefit analysis concluded that the benefits of implementing a

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[44] For example see, Presentation by N Gough, Director of International Relations – Vodafone Group, *Learning Lessons from Regulatory Interventions: Mobile Number Portability*, 18 April 2005. http://www.cept.org/E626C755-3A7F-43CB-8DE9-42BC75471DE0

centralised database solution exceed the costs. As such, SingTel does not consider that a review of charging arrangements is required.

4.34 However, as a general rule, SingTel considers that the principles of cost causation and the alignment of costs with benefits should be used to determine the relevant charging principles.

4.35 SingTel considers that these principles provide an appropriate basis for any charging arrangements that may be required as a consequence of the implementation of a centralised database solution.

4.36 SingTel does not consider it necessary to make any further comment on this issue, as it should be irrelevant to the IDA's review of number portability in the short term. SingTel does, however, reserve the right to make further submissions in relation to this issue if it considers necessary.

Advantages and disadvantages of direct routing

4.37 The IDA has requested comments on the pros and cons of direct routing vs indirect routing, including the issues need to be considered in deciding which method to adopt and what the likely cost components in implementing direct routing.

4.38 SingTel considers that the pros and cons of direct routing vs indirect routing are directly dependent on the level of ported numbers. As such, the issue of whether direct routing should be adopted depends on the extent to which calls are subject to porting.

4.39 SingTel agrees with the following statement made by the IDA in its Consultation Paper":[45]

> *"In ACQ, all calls to ported and non-ported numbers will require a database query. Therefore, while there will be efficiency improvements for calls to ported numbers, this improvement can be offset by inefficiency loss arising from unnecessary database queries for calls to non-ported numbers. However, as ported numbers increase, there will come a point where the efficiency improvement for calls to ported numbers will outweigh the efficiency loss for calls to non-ported numbers".*

[45] IDA, *Public Consultation on the review of number portability in Singapore*, 6 September 2005, page 10

4.40 However, SingTel considers that it would be highly inefficient for mobile and fixed calls to be subject to direct routing at this point in time. The actual level of porting of fixed and mobile numbers in Singapore is extremely low. SingTel does not consider that the actual level of porting of fixed and mobile numbers is such as to justify the adoption of direct routing. The adoption of direct routing based on current statistics would result in the overwhelming proportion of calls being subject to a database inquiry notwithstanding the fact they are not ported. This is highly inefficient.

4.41 Porting levels for mobile and fixed numbers have not reached a point which would justify the adoption of direct routing. Nor are calls likely to reach such a point in the foreseeable future, notwithstanding the existence of intense competition in the provision of mobile services and fixed calls.

4.42 SingTel considers that the adoption of the direct routing method at this point in time (and in the foreseeable future) will result in an inefficient use of network resources due to the small number of ported numbers.

4.43 Similarly, Ofcom has recently stated that direct routing should not be adopted for FNP in the United Kingdom on the basis that the level of porting did not justify subjecting the majority of calls to an inefficient database query. It stated:

> *"Certainly in the case of ACQ it seems likely that, since most calls are made to numbers which have not been ported, the efficiency gains would have to be relatively large to offset the efficiency losses.*
>
> *As a result, although there may come a point when a CDB solution using the ACQ is the most efficient outcome in response to growth in the proportion of ported numbers, it may also be the case that this point is never reached, i.e. if the level of number portability does not increase by enough to ensure that the efficient gains offset the inefficiencies and costs of installing the system".*[46]

5. IMPLICATIONS OF ALLOWING INTER-MODAL NUMBER PORTABILITY

IDA – Question 5

IDA notes that in Singapore, the number levels have been associated with the particular

[46] Ofcom, *An assessment of alternative solutions for UK number portability: A consultation document issued by Ofcom*¸ 26 August 2004, page 16.

type of service. However, the association of number levels with a particular service may no longer be sustainable due to technological and market developments. Therefore, it may not be critical or useful for end-users to identify a particular number with the type of service. IDA welcomes views and comments on possible implications of allowing inter-modal number portability (i.e. porting numbers between different services) and the de-linking of a particular number level with a type of service.

5.1 In this section, SingTel submits that:

(a) inter-modal porting should not be introduced;

(b) inter-modal porting is likely to result in confusion amongst consumers in relation to the functionality and charging arrangements that would apply to communications;

(c) the fact that a customer is technically able to retain a number for the purposes of inter-modal porting does not mean that the functionality associated with their original service can also be retained – the porting of a mobile number to a fixed line would remove the functionality originally associated with the mobile number, causing confusion amongst consumers; and

(d) consumers will not be able to determine the applicable charging arrangements in respect of a call by simply looking at the number they are calling following the introduction of inter-modal porting.

Functionality and charging arrangements for fixed and mobile services are different

5.2 Inter-modal porting is conceptually straightforward. It permits a mobile subscriber to have their mobile number ported to a fixed line and vice versa.

5.3 However, the fact that a customer is technically able to retain a number for the purposes of inter-modal porting does not mean that the functionality associated with their original service can also be retained. In particular, a fixed line is able to provide the same functionality as mobile services (e.g. most fixed lines cannot send or receive SMS or MMS messages). As such, it is highly likely that the porting of a mobile number to a fixed line would result in the removal of the functionality originally available to the customer in its capacity as a mobile subscriber.

5.4 Inter-modal porting is likely to result in confusion amongst consumers in relation to the functionality and charging arrangements that would apply to such communications.

5.5 Upon seeing a mobile number level, a consumer will automatically assume that the owner of the mobile number will be able to send the recipient SMS and MMS messages. This may not necessarily be the case if a mobile number is ported to a fixed line. Any SMS or MMS messages that are sent to this ported number would fail.

5.6 Consumers have a reasonable expectation that a mobile number level will be attended by a certain form of functionality. The association of a particular telecommunications service to a number level will allow consumers to immediately understand the functionality that is available to them in their communications with the other party.

5.7 In addition, inter-modal porting will also have adverse consequences for consumer awareness in respect of the charges payable for telecommunications services.

5.8 The introduction of inter-modal porting will result in confusion amongst consumers as to the applicable charging arrangements. Consumers will not be able to determine the applicable charging arrangements in respect of a call by simply looking at the number they are calling. SingTel does not consider this to be in the best interests of consumers.

5.9 SingTel also believes that its position on inter-modal porting is consistent with the IDA's established approach to number management. SingTel does not consider that there is any basis for altering this approach to number allocation and management. The association of number levels with specific types of services should be maintained. Differentiation of telephone services on the basis of number levels is required from a consumer protection perspective and should be maintained.

Mobile and fixed services are developing differently

5.10 SingTel believes it is highly premature to consider the adoption of inter-modal porting in Singapore. It is currently unclear as to whether the development of fixed and mobile networks will converge.

5.11 3GPP, the body responsible for technical standards and reporting for 3G mobile technology, is currently proceeding on a different development path to the International Telecommunications Union, the body responsible for the technical aspects of fixed line services. Indeed, the existing technical solution for MNP is

compatible to specifications set by 3GPP and the GSM Association (**GSMA**). SingTel considers that standardisation of protocols and standards across mobile and fixed platforms is needed before any consideration is given to the prospect of inter-modal porting.

6. OTHER POTENTIAL COMMON PLATFORM SERVICES

IDA – Question 6

IDA notes that in addition to having a centralised database infrastructure for number portability, such infrastructure can be expanded to support other common platform services. IDA welcomes views and comments on how the centralised database infrastructure can support and develop other aspects of the info-communications market, in particular content development. Are there other services and applications that can leverage on such infrastructure?

6.1 In its Consultation Paper, the IDA requested comments on how the centralised database infrastructure can support and develop other aspects of the info-communications market, in particular content development. It has also requested views on whether there are other services and applications that could leverage on such infrastructure.

6.2 The IDA appears to have confused the central database solution for FNP and MNP with a service platform. It has also failed to acknowledge that operators already have their own service platforms in place and that any attempt to build additional service functionality into a centralised database solution would further increase the costs associated with implementation. It appears that the IDA is seeking to expand the purpose for which a centralised database may be used in order to spread the costs of implementation and maintenance over a greater cross-section of the telecommunications sector. This appears to stem from the fact that the implementation costs for the purposes of number portability alone cannot be justified.

6.3 The arguments in favour of a centralised database seek to address problems in Singapore that do not even exist. In this Section, SingTel submits that:

(a) <u>the speculative functionalities of a centralised database confuses the issue of number portability</u> – the IDA's review of number portability is concerned with the implementation and management of the number porting process between operators. The introduction of other service functionalities which the IDA calls "common

platform services", ranging from digital rights to third party content access, is irrelevant. The focus of this present review must be confined to the management of the number porting process.

(b) the suggestion that additional service functions that could be provided by a centralised database is irrelevant and purely speculative – the five examples of potential services listed at paragraph 24 of the Consultation Paper have been raised without regard to any technical or practical feasibility issues. As indicated above, it also confuses a centralised number database with a service platform – the two are entirely different. This has nothing to do with number portability. In addition, the IDA has improperly speculated about the benefits of a centralised database claiming it will provide content providers with "faster and feasible means to retail their content with adequate protection"[47]. Such statements are highly speculative and potentially misleading as to the current ability of content providers to supply their content to operators.

(c) the suggested uses of a centralised database are already addressed on a commercial level in Singapore – the IDA has raised five potential uses of a centralised database outside number portability. However, the IDA has not raised any argument regarding the need for regulatory intervention to address any competitive failures in each of these areas. The reality is that operators have their own service platforms and other industry participants, such as content providers, already have their own commercial arrangements in place that effectively deal with each of these issues. There is no basis for regulatory intervention or even consideration of other functionalities. There is no evidence of market failure in respect of these commercial arrangements. Any interference by the IDA with these arrangements will undermine the natural evolution of such services through commercial arrangements.

(d) there is no economic justification for considering other uses of a centralised database or proposing it become a service platform – there is an assumption in the IDA's reasoning at paragraph 24 of the Consultation Paper that "more services equates to greater efficiency". This is a false presumption. If a centralised database is required to perform multiple functions outside the management of numbers in a porting environment, then it will necessarily require additional costs to build a system that can accommodate those extra functionalities. There is no cost-benefit analysis to support the presumption that a common database can, or should, support the additional functionalities proposed by the IDA.

(e) the centralised database proposal undermines incentives to minimise the costs of portability – increased functionality of a centralised database will ultimately be borne

[47] Paragraph 24(ii) of the Consultation Paper.

by consumers. This is because the increased cost of providing additional service functions will require increased investment by operators. It means that customers will be forced to pay for the inefficient investment of an industry where operators already have arrangements in place to perform the functionalities proposed by the IDA. The result of a centralised database to support additional functions will be an inefficient duplication of resources.

The speculative functionalities of a centralised database confuses the issue of number portability

6.4 The stated objectives of the IDA's review of number portability are to determine whether the existing technical solutions for number portability in Singapore are sufficient. By proposing a centralised database solution and speculating that such a solution can support "other value added services", the IDA has obscured or undermined the main purpose of this review. If the IDA wishes to conduct a review of the issues raises in paragraph 24 of the Consultation Paper, SingTel considers that this should occur independently of the number portability review. These are two separate issues. The IDA should treat them as such for regulatory purposes.

6.5 A centralised database is a place where subscriber numbers are stored and analysed to instruct the network where to route the call. It requires a mainly administrative function - populating the number into the database - to make this happen. However, the service platforms proposed by the IDA require the capability to offer real time functions, such as the "dynamic" inter-operating billing functions suggested by the IDA. The two different needs proposed should not be mixed into a single review process. Furthermore, there is no lack of competition among operators to provide value added services to consumers. There is therefore no need to transform a database into a service platform.

The suggested uses of a centralised database are already addressed on a commercial level in Singapore

6.6 Each of the issues raised as examples of enhanced centralised database functionality in the Consultation Paper are already addressed in commercial arrangements. The proposal for a centralised database would mean that operators who have made significant investments over time in their own systems (particularly costly and essential ones, such as inter-operator billing) would be forced to abandon those systems and incur new costs for the sake of a centralised database.

6.7 Operators already have their own common service platform (e.g. Parlay) and content management systems. Furthermore, there is no business need to develop additional

centralised platforms for competition or efficiency reasons. Nor is there any market failure. A centralised database solution for number portability should only be used to facilitate the porting of numbers between operators – the cost of implementing and maintaining a centralised database would increase significantly and unnecessarily duplicate existing commercial arrangements if it was extended to become a multi-service platform.

There is no economic justification for considering other uses of a centralised database

6.8 The purpose of a centralised database is for the mapping of ported numbers to operators. Adding other functionalities will only increase costs and complexity. Such services are already provided at a commercial level in Singapore, without either:

(a) any need for duplication; or

(b) any such duplication to be performed by a third party.

6.9 SingTel is particularly concerned about the lack of any economic justification for a centralised database in the Consultation Paper. Enhanced functionality will impose additional implementation, maintenance and call conveyance costs, which will ultimately be passed on to consumers. The IDA's suggestion will also complicate the issue of cost recovery for operators, because it will be impossible to properly differentiate between the set up costs associated with number portability and those of other functionalities. It is therefore inevitable that consumers will ultimately be worse off under a centralised database, because they will be bearing the costs of portability.

The centralised database proposal undermines incentives to minimise the costs of portability

6.10 The Consultation Paper also either assumes a one-off or inbuilt cost of a centralised database with expanded functions beyond number administration. Specifically for the fixed network, where migration of current TDM network to the NGN is forthcoming, spending more money to upgrade existing infrastructure is not worthwhile as the invested assets' life cycle will be short.

6.11 The need for a technical solution that minimises the costs of portability is one of the fundamental tenets of portability itself. Without the incentive to make the most efficient choice of technical solution, operators will employ a method which is either unsatisfactory from a service level (leading to poor quality of service); or opt for a "gold plated" solution that requires operators to recoup incurred costs from

consumers. In both cases, the improper incentive means that the consumer is worse off.

6.12 Such will be the case with a centralised database in Singapore. Without any cost benefit analysis of the need for its establishment, nor any regard to the fact that the functionalities are already being provided without the need for third party management, oversight and additional unwarranted investment, the result will be a regulatory-mandated incentive to make the least efficient choice of technical solution. As has been noted by the ACCC:

> *"Encouraging [operators] to adopt efficient technology is important given the size of the system set-up and call conveyance costs…Providing the incentives to make inefficient choices will impose substantial additional costs, which in the end will be the detriment of the long-term interests of end-users."*[48]

7. IDA'S PROPOSED APPROACH TO IMPLEMENT NUMBER PORTABILITY IN SINGAPORE

IDA – Question 7

IDA has proposed to adopt a centralised database approach for implementing number portability. The implementation of number portability must fulfil the number portability requirements set out by IDA. IDA also requires that mobile operators resolve all shortcomings in the MNP solution identified above. As a start, all existing fixed line operators (including IP Telephone serve providers allocated with number level "6") and mobile operators should interface with the centralised database to implement FNP and MNP.

IDA welcomes views and comments on IDA proposed approach set out above to implement the number portability in Singapore. Specifically, IDA welcomes views and comments on the following:

(i) The feasibility of using a centralised database approach for fixed and mobile number portability services in Singapore, in light of technology and market developments;

(ii) IDA's proposed number portability requirements to achieve the desired outcomes of number portability as set out in Annex 3; and

[48] ACCC, *Pricing Principles for Local Number Portability – A Guide*, June 1999, paragraph 6.2.

(iii) IDA believes that 9 months is a reasonable and adequate time for implementation of a new number portability solution. If respondents feel otherwise, please justify in detail why the timeframe is insufficient.

The adoption of a centralised database will not be feasible

7.1 The adoption of a centralised database for FNP and MNP will not be feasible. In this submission, SingTel has observed that:

(a) market developments do not support the establishment of inter-modal porting;

(b) the existing technical solution is sufficient and provides an adequate basis for switching by customers;

(c) the adoption of a new database solution would not increase competition or encourage further switching by customers;

(d) the costs associated with the adoption of a centralised database are likely to outweigh the costs; and

(e) there are little, if any, benefits arising from the adoption of a centralised database.

7.2 On this basis, SingTel concludes that it is not feasible to implement a centralised database solution in Singapore at this time. SingTel considers that the IDA should conduct a comprehensive cost-benefit analysis in order to understand the likely costs associated with the establishment of a centralised database.

The IDA's proposed requirements for number portability

7.3 The IDA's number portability requirements set out in Annex 3 of the Consultation Paper are laden with unsubstantiated and value-based assumptions. These requirements appear to represent the IDA's "wish list" with respect to a number portability solution. In any event, the IDA's number portability requirements are largely satisfied within (or capable of satisfaction with minor changes to) the existing technical solutions for FNP and MNP.

7.4 In response to the specific points raised by the IDA in Annex 3, SingTel notes that the following:

(a) no unreasonable degradation in service quality, reliability and convenience to end-users - the existing FNP and MNP solutions do not result in an unreasonable degradation of service quality, reliability and convenience to end users following the porting of a customer – SingTel does not consider that a customer's porting experience will improve upon the adoption of a centralised database approach. As previously noted, the technical solution is not the cause of switching, it merely facilitates it. A customer will be unaware of the technical solution that is used to provide number porting.

(b) cost effective, efficient and robust solution in the long run – SingTel has sought demonstrate that the costs of adopting a centralised database are likely to significantly outweigh the benefits. The existing technical solutions are cost effective, efficient and robust.

(c) easily scalable and capable of meeting future porting demands – the existing technical solutions are capable of meeting future porting demands (which are likely to be moderate in any case). It is unlikely that the adoption of a centralised database will result in a scalable solution. Any centralised database that is adopted within the existing legacy network infrastructure will become redundant upon the launch of NGNs over few years.

(d) ensure efficient use of numbering resources – there is no shortage of numbering resources, The IDA cannot reasonably claim that this should be a valid requirement for number portability.

(e) a long-term robust, cost effective and efficient solution, facilitates ease of entry of new players and non-discriminatory treatment between players – the existing technical solution does not present insurmountable difficulties or issues for new entrants. The adoption of a centralised database will result in operators (including new players) incurring significant costs. SingTel considers that it more efficient for these players to adopt the existing technical solution. The adoption of a new solution as proposed by the IDA will be more costly for the industry and consumers compared to minor modifications to the existing technical solution.

(f) reliance on the donor network should not be required to route calls to ported subscribers – as demonstrated above, the implementation of direct routing is highly inefficient in light of the current number of ported customers. The IDA's proposal cannot be justified from a cost-benefit perspective.

(g) no unnecessary or adverse impact to service provisioning of other service providers in the implementation of the new NP solution – this is an actual implementation issue. This issue can be addressed during the implementation phase of a new technical solution for number portability.

Timeframe for implementation of new technical solution

7.5 The IDA's suggested implementation timeframe is unrealistic and unachievable. In most jurisdictions, implementation of number portability has taken several years. It appears that the IDA has underestimated the amount of work that must be undertaken prior to and as part of the implementation process.

7.6 In setting an implementation timeframe, the IDA must have regard to the following issues:

(a) finalisation of cost-benefit analysis;

(b) finalisation of cost allocation and charging arrangements between 2 fixed, 3 mobile and 6 WBA operators, and an unknown number of IP telephony providers;

(c) implementation related issues, including:

(i) tender selection of centralised database operator;

(ii) tender selection of vendor;

(iii) agreement of common standards and establishing the type of communication protocol (e.g. INAP);

(iv) other specifications to be used between the central database and various networks;

(v) migration of existing MNP users;

(vi) system modifications, upgrades, integration and testing of new number porting processes; and

(vii) commercial trial and field testing of the new system prior to the launch to the public.

7.7 In other countries where a database solution has been introduced, implementation took a matter of years, rather than months. It is highly fanciful to suggest that operators in Singapore can implement the IDA's proposed database solution in a matter of months.

7.8 The above issues cannot reasonably be finalised within 9 months. SingTel estimates that at least 24 months are required for the successful implementation of a new number portability solution.