

Infocommunications Development Authority Of Singapore (IDA)

Methodology for Determining Fixed and Mobile Inter-operator Number Portability Charges

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This document sets out the guidelines for calculating and estimating the charges for number portability (NP) services. The methodology has been prepared to guide fixed and mobile network operators, in Singapore, in their estimation of inter-operator charges for NP related services. The guidelines serve to provide a checklist of items and issues that should be considered in the determination of the charges. In releasing these guidelines to operators, Infocommunications Development Authority of Singapore (IDA) wishes to demonstrate the broad framework that will be applied to assess and review future NP charging proposals submitted to IDA.

Operators will receive written notice of IDA's requirement to determine charges according to the guidelines prescribed below. IDA has released this document to operators to provide, in advance, an illustration of the types of information that must be collected and compiled for future submissions on NP charges. IDA acknowledges that there may be exceptions to the rules noted below and welcomes operators to set out their comments accordingly in their next submissions. Such exceptions will be accepted by IDA provided they have a sound rationale for their application and they conform, in broad terms, to the guidelines set out below.

The information required to estimate and determine NP charges must be reconcilable to financial and other statistical reports submitted to IDA on an ongoing basis. Specifically, IDA requires assurance that the financial information reported is reconcilable to audited financial statements and that the information prepared is consistent with the guidelines noted in this document. A prototype cost model will be provided to assist operators with future cost estimations.

1 Exclusions

1.1 System Set-up Costs

The costs of setting up NP systems or capabilities within each operator's network are to be excluded from any determination of NP charges. Examples of these costs are:

- The costs of establishing and maintaining the databases that contain information on ported numbers;
- The costs of software upgrades necessary to modify switches so that they can route calls to ported numbers; and
- The costs of hardware and software necessary to support billing and administration of NP.

1.2 Indirect Fixed Costs

Common fixed costs that are incurred to provide both NP and other telecommunications services, are to be excluded from the determination of NP charges. Examples of these costs are:

- Costs, namely salaries and related overhead items, associated with indirect supervision, management and executive personnel;
- Fixed capital and operating costs associated with facilities that are used to provide both NP and other telecommunications services, i.e. the costs which would not be avoided if NP services were no longer provided by the operator; and
- Other fixed costs that would not be avoided by an operator if NP services were no longer provided by the operator.

2 Inclusions

Costs, which are deemed relevant in the estimation of NP charges, are those that are *caused* by the provision of NP services. These costs fall into two general categories: administrative processing costs and conveyance costs. The principles for identifying and determining the relevant costs for each of these categories are as follows:

- Only costs that are *incremental* to processing NP applications and providing additional conveyance to ported numbers are considered relevant. The relevant cost standard to apply is the Long Run Average Incremental Cost (LRAIC) of such functions. LRAIC comprises all variable costs and those fixed costs that are *directly* attributable to the incremental change in NP services, as well as a share of indirect costs that are discernibly caused by the provision of NP. LRAIC includes capital costs such as depreciation of relevant assets, cost of capital employed, and all incremental operating expenses.
- Forward Looking Economic Costs (FLEC) is the basis upon which operators are required to estimate the cost of providing NP services. FLEC requires that costs reflect the most cost-effective technology currently available, and which can accommodate projected growth over a specified time horizon, and the most efficient business processes to support provision of NP services.

IDA may require operators to demonstrate that the costs used in determining NP charges are those costs that would be avoided if NP services were no longer provided.

3 Methodology

A description of the methodology for determining charges for both administrative NP services and conveyance services is set out in this section. This methodology provides definitions for the services to be costed, the information requirements that operators must maintain to estimate and validate their submissions, the relevant costs and volumes to be used to estimate the cost per unit of service. Methodologies are set out for:

- Applications processing and one-time set-up NP services;
- Conveyance of calls to subscribers who have ported their numbers on the fixed telecommunications network; and
- Monthly recurring processing of calls to subscribers who have ported their numbers on the mobile telecommunications network.

3.1 Application Processing Costs and One-time Set-up Costs

3.1.1 NP Application Processing Costs

- NP application processing costs include the costs associated with setting up a subscriber who wishes to port their number from the Donor Network to another operator's (or Recipient's) network.
- In the case of Fixed Number Portability (FNP) five types of NP application processing services are identified:
 - *NP applications* where the Recipient Network Operator (RNO) submits a duly completed NP application form from a customer to the Donor Network Operator (DNO) for processing;
 - *NP Port-Back applications* arise when a customer who had previously applied to the RNO for NP, requests to be ported back to the DNO. In this case, the application will be treated as a new NP application and the DNO will then become the RNO.
 - *NP Termination* where the RNO submits a duly completed NP termination form from the customer to the DNO for processing; and
 - *NP Withdrawal* where prior to the implementation of NP service, the RNO submits a NP withdrawal form to the DNO to withdraw a NP application.
 - An additional surcharge applies where a DNO, that typically processes NP applications overnight, is required to activate NP during the daytime.
- In the case of Mobile Number Portability (MNP) application processing costs are consolidated into a one-time set-up charge.

3.1.2 Processing Scenarios

- The following processing scenarios, for each category of NP application, should be considered in estimating charges:
 - Processing an application for a *single* porting subscriber; and
 - Processing applications for a *batch* of 50 subscribers;
- Processing an application for a *single* subscriber, such as a business customer, that wishes to port a *block* of numbers:
 - A subscriber porting a block of 51 to 2,000 numbers; and
 - A subscriber porting a block of over 2,000 numbers.

3.1.3 Activity Profiles

- For each type of processing scenario list, operators should provide:
 - Applications processing process flow diagrams, their activities, and their process and activity descriptions, and the type of personnel, i.e. administrative, technical, other, that undertake the procedures; and
 - The duration (estimated number of minutes) required to complete each activity for each class of personnel.
- Direct supervision activities may separately identified or, alternatively, the following assumptions may be applied:
 - The ratio of supervisory administrative staff to administrative personnel directly involved with processing NP applications; and
 - The ratio of supervisory technical staff to technical staff directly involved with processing NP applications.

3.1.4 Study Period

- The relevant study period, over which the estimates for costs and volumes are as follows:
 - Actual costs and volumes are to be compiled for the current fiscal period, or the time frame prescribed by IDA; and
 - Future or projected costs and volumes are to be compiled for the up coming fiscal period, or the time frame prescribed by IDA.

3.1.5 Relevant Costs

- The relevant costs must be compiled for each scenario described in section 3.1.2 and the study period noted in section 3.1.4. The illustrative cost model provided may be used for reference.

- 3.1.5.1 Staff-related Costs
- The relevant staff-related costs must be provided for each of the activities described in section 3.1.3.
 - Staff-related costs include the cost of administrative, technical and direct supervisory personnel involved in processing NP transactions.
 - These costs also include employee benefits (i.e. fringe benefits) for each of the categories of personnel noted above. An estimated percentage (i.e. employee benefits to salary costs) may be used in lieu of actual numbers. Rationale supporting this percentage must be provided.
- 3.1.5.2 Accommodation Costs
- Accommodation costs include the *direct* rental costs, excluding internal overheads, for space used by staff involved in processing NP transactions. Only the accommodation costs that would be avoided if NP services were no longer provided should be itemised. Other unavoidable space costs should be excluded from this cost category.
 - The cost of utilities associated with the space used by staff involved in processing NP transactions. Only the utilities costs that would be avoided if NP services were no longer provided should be itemised. Other unavoidable utilities costs should be excluded from this cost category.
- 3.1.5.3 Facilities Costs
- Facilities costs include the cost of other fixed assets (e.g. furniture) used by personnel involved in processing NP applications. Costs incurred to set up associated systems are to be excluded from this cost category.
- 3.1.5.4 Other Costs
- This category of expenses includes other costs, which are related to processing NP applications, and are not included in the items noted above. Items could include supplies, telephone and/or fax communications, etc. Any costs incurred to set-up systems are to be excluded from this category.
 - Operators must itemise and describe, in detail, those cost items that represent more than 5% of the cost of processing NP applications.
- 3.1.6 Relevant Volumes**
- The relevant volumes must be compiled for each scenario and activity described in sections 3.1.2 and 3.1.3 and the study period noted in section 3.1.4. The illustrative cost model provided may be used for reference.

3.1.6.1 NP Applications

- FNP applications volumes include:
 - The actual volume of *successful* NP applications, NP port-back applications, NP terminations and NP withdrawals for the current fiscal period, or the time frame prescribed by IDA; and
 - The anticipated or estimated volume of *successful* NP applications, NP port-back applications, NP terminations and NP withdrawals for the next fiscal period.
- The sum of the different types of NP applications volumes should equal the total NP transactions processed. The rationale for exceptions to this rule should be provided accordingly.
- MNP applications volumes include:
 - The actual volume of successful NP applications; for the current fiscal period, or the time frame prescribed by IDA; and
 - The anticipated or estimated volume of NP applications for the next fiscal period.
- The assumptions behind volume forecasts and supporting rationale should be provided accordingly.

3.1.6.2 Personnel

- Personnel related volumes include headcount statistics (full time equivalent personnel) of each category of staff involved in processing NP applications and activity duration times for each activity performed, by class of personnel.
- If no headcount for direct supervision is provided, a ratio of staff to direct supervisors, or other such assumption, may be applied.

3.1.6.3 Accommodation and Facilities

- Accommodation volumes include the amount of square footage used by administrative staff processing NP applications.
- Facilities volumes include the units of furniture and other facilities that are used by staff processing NP applications.

3.2 FNP Conveyance Costs

3.2.1 FNP Conveyance Costs

- FNP conveyance costs are the *additional* costs involved in routing a call to a subscriber with a ported number, compared to the costs involved in routing a call to a subscriber with a non-ported number.
- FNP conveyance charges are levied on a per call basis.

3.2.2 Call Scenarios

- To determine the *incremental costs* associated with the cost of conveying calls to a customer who has ported their number to another network, a comparison of conveyance costs for the following call routing scenarios needs to be completed:
 - A call originating on the DNO's fixed network and terminating at a *ported* customer who is on the RNO's fixed network;
 - A call originating on the DNO's fixed network and terminating at a *non-ported* customer who is on the RNO's fixed network; and
 - A call originating on the RNO's fixed network and terminating at a customer who *ported* his number to the RNO's network from another fixed operator's network.

3.2.3 Network Components

- For each type of call scenario:
 - Provide a network flow diagram of network elements that illustrates the network components that are consumed with each call routing type;
 - List the network components, along with their descriptions, that are used to complete each call type;
 - List the network component driver, e.g. whether the cost of the component is provisioned on the basis of anticipated call attempts, or minutes of traffic, or other basis; and
 - Assumptions regarding holding times, number of minutes per call, number of calls per subscriber etc.

3.2.4 Study Period

- The relevant study period, over which the estimates for costs and volumes are as follows:
 - Actual costs and volumes are to be compiled for the current fiscal period, or the time frame prescribed by IDA; and
 - Future or projected costs and volumes are to be compiled for the up coming fiscal period, or the time frame prescribed by IDA.

3.2.5 *Relevant Costs*

- The relevant costs must be compiled for each call scenario and network component described in sections 3.2.2 and 3.2.3 and the study period noted in section 3.2.4. The illustrative cost model provided may be used for reference.

3.2.5.1 Network Component Costs

- Network component costs comprise the annualised capital costs for the traffic sensitive and call attempt sensitive network components that are used to complete the calls for each call scenario described in section 3.2.1.
- Where the unit cost of network components are not prescribed by IDA, Operators should note their assumptions regarding:
 - The original purchase (or installed) cost of the network component,
 - The estimated capacity of the network component,
 - The traffic (minutes, call attempts, database dips, etc.) volumes during peak and non-peak periods,
 - The cost of capital, and
 - The estimated useful lives used to determine annualised capital cost.

3.2.5.2 Operations & Maintenance Costs

- The Operations & Maintenance (O&M) costs include expenses that are incurred to operate and maintain the network components that are used to complete the calls for each of the call scenarios described in section 3.2.2.
- Alternatively a percentage (O&M costs as a percentage of capital costs), or other such assumption, may be used in lieu of actual costs. Rationale supporting this percentage must be provided.

3.2.5.3 Other

- Other expenses are those costs associated with the conveyance of calls to ported numbers but not included in the items noted above.
- Operators must itemise these costs if they represent more than 5% of the cost of processing NP applications.

3.2.6 *Relevant Volumes*

- The relevant volumes must be compiled for each scenario and activity described in sections 3.2.2 and 3.2.3 and the study period noted in section 3.2.4. The illustrative cost model provided may be used for reference.

3.2.6.1 Conveyance Volumes

- Conveyance volumes for each type of call scenario noted in section 3.2.2, namely:
 - The actual volume of calls to ported numbers since implementation of NP for the current fiscal period, or the time frame prescribed by IDA; and
 - The anticipated or estimated volume of NP conveyance calls, for each call scenario, for the next fiscal period.
- The assumptions behind volume forecasts and supporting rationale should be provided accordingly.

3.2.6.2 Ported Customers

- The volume of ported customers includes actual and projected estimates for:
 - The number of customers who have ported their numbers to another network and the network to which they have been ported; and
 - The number of customers who have ported their numbers from another network.

3.3 MNP Monthly Recurring Costs

- 3.3.1 MNP Monthly Recurring Costs**
- MNP conveyance costs are the *additional* costs involved in routing a call to a subscriber with a ported number, compared to the costs involved in routing a call to a subscriber with a non-ported number.
 - Monthly recurring charges are levied on a per subscriber basis.
- 3.3.2 Call Scenarios**
- To determine the *incremental costs* associated with the cost of conveying calls to a customer who has ported their number to another network, a comparison of conveyance costs needs to be completed for the following call routing scenarios:
 - A call originating on the DNO's mobile network and terminating at a *ported* customer who is on the RNO's mobile network;
 - A call originating on the DNO's mobile network and terminating at a *non-ported* customer who is on the RNO's mobile network; and
 - A call originating on the RNO's mobile network and terminating at a customer who *ported* his number to the RNO's network from another mobile operator's network.
- 3.3.3 Network Components**
- For each type of call scenario:
 - Provide a network flow diagram of network elements that illustrates the network components that are consumed with each call type;
 - List the network components, along with their descriptions, that are used to complete each call type;
 - List the network component driver, e.g. whether the cost of the component is provisioned on the basis of anticipated call attempts, or minutes of traffic, or other basis; and
 - Assumptions regarding holding times, number of minutes per call, number of calls per subscriber etc.

3.3.4 Study Period

- The relevant study period, over which the estimates for costs and volumes are as follows:
 - Actual costs and volumes are to be compiled for the current fiscal period, or the time frame prescribed by IDA; and
 - Future or projected costs and volumes are to be compiled for the up coming fiscal period, or the time frame prescribed by IDA.

3.3.5 Relevant Costs

- The relevant costs must be compiled for each call scenario and network component described in sections 3.3.2 and 3.3.3 and the study period noted in section 3.3.4. The illustrative cost model provided may be used for reference.

3.3.5.1 Network Component Costs

- Network component costs include the annualised capital costs for the traffic sensitive and call attempt sensitive network components that are used to complete the calls for each call scenario described in section 3.3.2.
- The following assumptions used to determine annualised capital costs must be documented accordingly:
 - The original purchase (or installed) cost of the network component,
 - The estimated capacity of the component,
 - The traffic (minutes, call attempts, database dips, etc.) volumes during peak and non-peak periods,
 - The cost of capital, and
 - The estimated useful lives used to determine annualised capital cost.

3.3.5.2 Operations & Maintenance Costs

- The O&M costs are those costs that are incurred to operate and maintain the network components that are used to complete the calls for each of the call scenarios described in section 3.2.2.
- Alternatively a percentage (O&M costs as a percentage of capital costs), or other such assumption, may be used in lieu of actual costs. Rationale supporting this percentage must be provided.

3.3.5.3 Other

- Other expenses include those costs that are associated with the conveyance of calls to ported numbers but not included in the items noted above.
- Operators must itemise these costs if they represent more than 5% of the cost of processing NP applications.

3.3.6 *Relevant Volumes*

- The relevant volumes must be compiled for each scenario and activity described in sections 3.2.2 and 3.2.3 and the study period noted in section 3.2.4. The illustrative cost model provided may be used for reference.

3.3.6.1 *Conveyance Volumes*

- Conveyance volumes for each type of call scenario noted in section 3.2.2, namely:
 - The actual volume of calls to ported numbers for the current fiscal period, or the time frame prescribed by IDA; and
 - The anticipated or estimated volume of NP conveyance calls, for each call scenario, for the next fiscal period.
- The assumptions supporting volume forecasts.

3.3.6.2 *Ported Customers*

- The volume of ported customers includes actual and projected estimates for:
 - The number of customers who have ported their numbers to another network and the network to which they have been ported; and
 - The number of customers who have ported their numbers from another network.

Enquiries

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