

Requirements for Mobile Number Portability by Database Solution



**Communications Authority
Hong Kong**

Revision History

Issue No.	Date Issued	Note
6	December 2022	<p>(1) Incorporated Annexes D to F into HKCA 2103.</p> <p>(2) Main body: Amended the structure of the Information Exchange Document.</p> <p>(3) Annex D: Amended the procedures for handling MNP applications made by electronic means and using pre-paid SIM cards.</p> <p>(4) Annex E: Included email as an additional communications option and ICCID number in a database field.</p>
6.1	June 2024	<p>Annex D: Removed outdated requirements applicable before 1 July 2023.</p> <p>Annex F: Included a new two-byte network identification code.</p>

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Requirements for Mobile Number Portability **by Database Solution**

1. General

- 1.1 Mobile number portability (MNP) is the ability for a customer to retain his/her assigned mobile telephone number when changing the subscriptions from one mobile network operator (MNO) to another MNO.
- 1.2 Licensees for the provision of fixed or mobile services (including holders of Unified Carrier Licence (UCL) (with provision of fixed or mobile service authorised), and Services-Based Operator (SBO) Licence providing Class 1 or mobile virtual network operator (MVNO) services) (hereafter referred to as the **Network Operators**) are required to facilitate MNP among their networks.
- 1.3 This document sets out the interface requirements allowing MNP whereby the routing information is obtained by making reference to a database, such as the one established in an **intelligent network (IN)**. In this connection, unless otherwise stated to the contrary, the telephone calls considered in this document will be restricted to calls involving ported mobile numbers only. The functional specifications for non-porting mobile numbers are included in this document for reference.
- 1.4 This document should not cause conflicts with calls not involving ported numbers.

2. Definition of Terms

Administration Database (AD):	The off-line database that mainly performs the backup and auditing role for all ported-out and ported-in numbers, and is required to store all mobile operators' working and history records of ported-out and ported-in numbers and their corresponding information.
AD Maintenance Agent (MA):	The Network Operator that is designated to be responsible for the agreed operation, administration and maintenance work of the physical AD server.
Directory Number (DN):	The telephone number that is dialled by a calling party to reach the called party. If the called party is a mobile customer

	which has been ported from the Donor Network to the Recipient Network, this is the same as the ported number.
Donor Network Operator (DNO):	Operator of the Mobile Network from which the number is being or has been ported.
Donor Network:	The network of the DNO.
DNO MA:	The MA of the DNO.
Gateway Number (GN) Database:	The database that provides translation of the ported number into the GN.
Integrated Circuit Card Identifier (ICCID) number:	The primary account number of a SIM card as defined by the ITU-T Recommendation E.118. It is a unique identifier of a SIM card which is stored in a SIM card and, where it is a physical SIM card, is also engraved or printed on the SIM card body and cardholder certificate.
MNP Provider:	The Network Operator which provides number portability translation service to the Originating Network for the purpose of routing of calls to the Recipient Network. An MNP Provider may also play the role of a Transit Network if requested by the Originating Network.
Mobile Network Operator (MNO):	Licensee that holds a UCL for the provision of public mobile radiocommunications services.
Mobile Virtual Network Operator (MVNO):	Licensee that holds a SBO Class 3 Licence for the provision of MVNO services.
Original DNO:	Operator of the mobile network from which the number was first ported.
Originating Network:	The mobile or fixed network from which a call is originated.
Other MA:	The MA which is representing neither the RNO nor the DNO for the porting request.

ported number:	Mobile number of a customer which has been ported from the Donor Network to the Recipient Network.
Receiving Network Operator:	The Network Operator that retrieves information exchange files from the Sending Network Operators.
Recipient Network Operator (RNO):	Operator of the mobile network which has gained the ported number.
Recipient Network:	The network of the RNO.
RNO MA:	The MA of the RNO.
RNR requirement:	Real-name registration for SIM cards required under the Telecommunications (Registration of SIM Cards) Regulation (Cap. 106AI).
Sending Network Operator:	The Network Operator that sends information exchange files to other Network Operators.
Terminating Network:	The mobile network to which the called number is connected. This is the same as the Recipient Network.
Transit Network:	The network which is involved in carrying a call between the Originating Network and the Terminating Network but which is neither the Originating Network nor the Terminating Network.

3. Operators' Responsibilities

3.1 Requirements on Originating Network

- 3.1.1 Calls originating in the Originating Network shall be passed to the Recipient Network over one or more pre-determined **Points of Interconnection(s) (POI)**.
- 3.1.2 The Originating Network has to recognise a call to a ported number and translate it into a **GN** pre-determined by the Recipient Network before it delivers the call to Recipient Network. The call is then routed to the Recipient Network using the GN. Unique blocks of GN will be centrally

allocated by the Communications Authority (“CA”) to each Network Operator. The Originating Network can, with mutual agreement, rely on an MNP Provider to provide number translation and/or routing services for ported number recognition, GN translation and/or routing of the call to the Recipient Network.

- 3.1.3 The Originating Network shall ensure that calls destined for numbers residing on its own network shall not be passed to another network except its own MNP Provider(s).
- 3.1.4 Calls delivered from the Originating Network to the Recipient Network should use a routing which is technically and operationally most efficient.

3.2 Requirements on Transit Network

- 3.2.1 Calls passing through the Transit Network shall be routed to the Recipient Network over one or more pre-determined POI(s).
- 3.2.2 The Transit Network has to route the call to the Recipient Network in a way which is technically and operationally most efficient.

3.3 Requirements on MNP Provider and MA

General

- 3.3.1 In this document, all the defined responsibilities would refer to the Network Operators only, although the Network Operators could delegate the responsibilities concerned to their MNP Provider(s) and/or their MA(s). Every Network Operator should nominate one or more MNP Provider and MA, which may be the Network Operator itself. The Network Operator should ensure proper coordination between its MNP Provider(s) and its MA(s).

MNP Provider

- 3.3.2 An MNP provider has to provide database look-up and number portability translation service to its associated Originating Network for the purpose of routing of calls to the Recipient Network. The MNP Provider has the responsibility to update its GN database on behalf of its associated Network Operator.

MA

- 3.3.3 An MA is responsible for the agreed operation, administration and maintenance work of the physical AD server as designated by a Network Operator. The MA has the responsibility to update its AD on behalf of its associated Network Operator.

3.4 Requirements on Donor Network

- 3.4.1 The DNO shall ensure that any ported number is not reassigned to another customer of the DNO unless and until the number is relinquished by the RNO.
- 3.4.2 The DNOs will, at such intervals as may be required by the Office of the Communications Authority (OFCA), file reports to OFCA on details of numbers ported from their networks.

3.5 Requirements on Recipient Network

- 3.5.1 After having received a call over the POI from the Originating Network (or Transit Network), the Recipient Network will connect the call to the destined ported number in a manner that is technically and operationally most efficient.
- 3.5.2 Under the conditions where Calling Line Identity (CLI) is transferred, calls originated by the ported number shall have the CLI set to the Directory Number (as a calling number) and not to any other number that may be used by the Recipient Network for completing incoming calls.
- 3.5.3 When a ported number ceases to be used in the Recipient Network, the ported number shall be relinquished by the RNO and returned to the Original DNO (see also Section 4.3).
- 3.5.4 RNOs will, at such intervals as may be required by OFCA, file reports to OFCA on details of numbers ported to their networks.

3.6 Requirements on GN Database

- 3.6.1 The RNO needs to send the necessary ported number information, as defined in **Annex A**, to the DNO and all other Network Operators concerned. Such information may then be kept in the GN databases of all MNP Providers which store the necessary routing information for implementing MNP.
- 3.6.2 Network Operators are encouraged to deploy a common interface standard for their database. However, in order that Network Operators may retain sufficient control and flexibility over the implementation of their own

networks, the common interface standard may incorporate a number of variants, as may be determined jointly by the Network Operators and the CA.

- 3.6.3 Means should be provided to ensure that for the purpose of MNP, the minimum number of interrogations to the database would be required. Nevertheless, the actual number of interrogations to the database could be more than the minimum due to considerations other than the number portability requirements, and will be determined by the respective Network Operators.
- 3.6.4 Means should be provided to ensure that the data for each newly ported number or newly relinquished number is effected in a concurrent manner on all databases and that an audit trail should be available to ensure that data integrity is maintained.
- 3.6.5 Applications of the information on the databases shall be restricted to those for operational purposes, such as for routing of calls and fault handling. Without bilateral agreement, Network Operators shall not make use of the information obtained from the databases for any other purposes.

3.7 Requirements on AD

The functional requirements for the AD should be referred to **Annex C** and the HKCA 2104 - Functional Specification of Administration Database for Mobile Number Portability.

3.8 Implementation Options of MNP

- 3.8.1 **Option 1 - Self-Built MNP Function:** Under the basic requirement, the Originating Network has to recognise a call to a ported number and translate it to a GN pre-determined by the Recipient Network. The Originating Network may meet this requirement by building its own MNP function. This is illustrated in the following Figures 1 and 2.

Figure 1: Calls to Ported Number Originated by Recipient Network with self-built MNP function

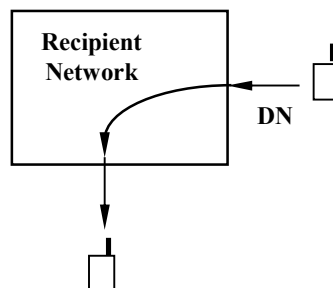
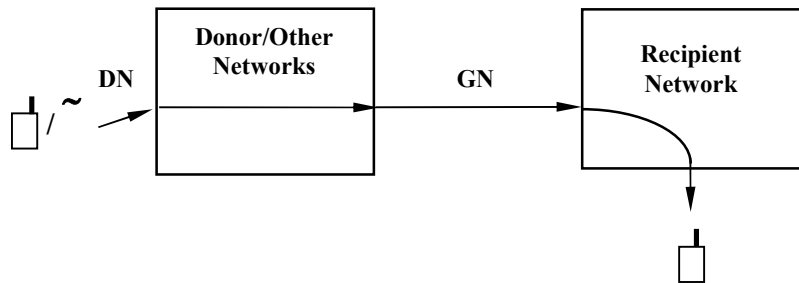


Figure 2: Calls to Ported Number originated by Donor Network or Other Network (Network other than Donor and Recipient Network) with self-built MNP function



- 3.8.2 **Option 2 - Call Routing to External MNP Provider:** The Originating Network can, on mutual agreement, pass its originating calls to an MNP Provider for GN translation and transiting of calls to the Recipient Network. This is illustrated in the Figures 3 and 4.

Figure 3: Calls to Ported Number Originated by Recipient Network which are passed to an MNP Provider for Number Portability Database Look-up and Routing

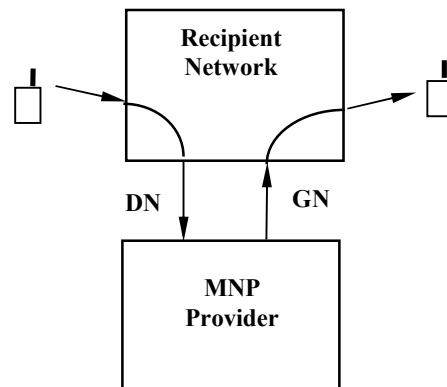
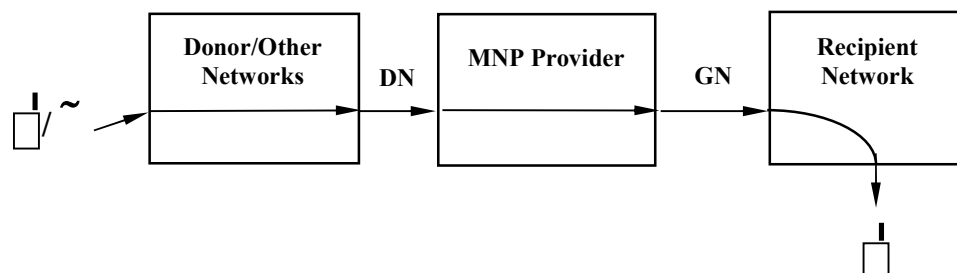


Figure 4: Calls to Ported Number Originated by Donor Network or Other Network (Network other than Donor and Recipient Network) which are passed to an MNP Provider for Number Portability Database Look-up and Routing



- 3.8.3 **Option 3 - Access to External GN Database:** The Originating Network can, on mutual agreement, establish a signalling link to the GN database of an MNP Provider in order to recognise a call to a ported number and perform GN translation. The call is then routed from the Originating Network to the Recipient Network using the GN over one or more pre-determined POIs. This is illustrated in the following Figures 5 and 6. The requirements for the signalling data link interface should be referred to Section 3.6.2.

Figure 5: Calls to Ported Number Originated by Recipient Network which are passed to an MNP Provider for Number Portability Database Look-up only

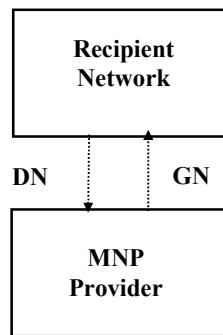
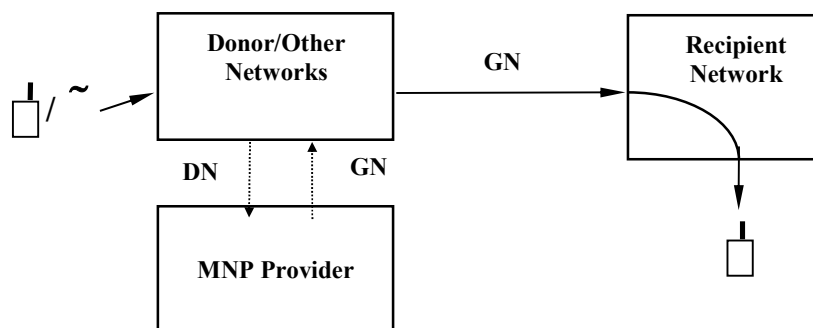


Figure 6: Calls to Ported Number Originated by Donor Network or Other Network (Network other than Donor and Recipient Networks) relying on an MNP Provider for Number Portability Database Look-up only



- 3.8.4 An individual Network Operator may choose any combination of the above for actual implementation of MNP.

4. Number Porting Activation and Termination

4.1 Number Porting Service Request and Activation Process

General

- 4.1.1 Each Network Operator will be responsible for number portability internal to its own network and which does not affect other Network Operators. This document describes the inter-operator MNP procedures that require joint or coordinated activities. To achieve MNP, each Network Operator should nominate one or more MNP Provider and MA, which could be the Network Operator itself, to provide GN database look-up and other logistic services. The internal procedures and agreement between a Network Operator and its MNP Provider(s) and MA(s) are outside the scope of this document.

Negotiation Phase

- 4.1.2 The RNO will send a Number Portability Request (NPR) with proposed cutover date/time to the DNO at least 24 working hours in advance of the proposed cutover date and time (see Section 4.1.6). On receipt of the NPR from the RNO, the DNO performs initial checks and carries out necessary steps to facilitate the porting of the number concerned.

If initial checks are passed, the DNO will reply the RNO by sending an Acknowledgment to NPR (AKNPR) to the RNO. For NPRs received by the DNO from the RNO in the morning session (09:00-12:00), the DNO should reply before 16:00 in the same day. For NPRs received by the DNO from the RNO in the afternoon session (12:00-18:00), the DNO should reply before 16:00 in the next day.

If problems are found in the initial checks, the DNO will send a Negotiation of NPR (NTNPR) to the RNO to advise of the problem(s) and, if appropriate, any suggestion(s) to resolve the problem(s). On receipt of the NTNPR, depending on the nature of the problem(s), the RNO will either further negotiate and issue revised NPR(s) to DNO or issue Cancellation of NPR (CLNPR) to DNO.

Provisioning Phase

- 4.1.3 On receipt of AKNPR from the DNO, the RNO will then send an Advice of Portable Number (APN) with the cutover details (described in **Annex A**) to all the Network Operators in advance of the agreed cutover date and time. The APN should be sent by the RNO before 17:30 of the same day for NPRs in the morning session and before 17:30 of the next day for NPRs in the afternoon session.

On receipt of the APN, all the Network Operators will reply to the RNO with an Acknowledgment to APN (AKAPN) to confirm the receipt of the APN sent by the RNO. The Network Operators should proceed the cutover on the

agreed cutover date and time. The AKAPN should be replied to the RNO before 19:00 of the same day for NPRs in the morning session and before 09:00 of the next day for NPRs in the afternoon session.

- 4.1.4 The pre-provisioning activities of the RNO must not interfere with the existing routing of calls to and from the porting-in mobile customer who is still using the Donor Network.
- 4.1.5 If any difficulties are encountered by either the RNO or the DNO or other Network Operators that would jeopardise the achievement of the agreed cut-over date/time, then the case should be handled according to **Annex E** - Exceptional Cases for Mobile Number Portability Provision (see also Section 5).

Completion Phase

- 4.1.6 For normal cases of MNP porting, the following process time should be complied by the Network Operators. For NPRs sent by RNO to DNO in the morning session (09:00-12:00) of Day 1, the whole process of porting should be completed by the mid-day cutover window (12:00-14:00) of Day 2. For NPRs sent by RNO to DNO in the afternoon session (12:00-18:00) of Day 1, the whole process of porting should be completed by the mid-night cutover window (01:00-04:00) of Day 3.
- 4.1.7 If the RNO does not identify any faults or receive any fault reports from other Network Operators by a specified period after the completion of the cutover window, then the RNO will consider the cutover as successful. The RNO will then send a Successful Completion of APN (SCAPN) to all the Network Operators to confirm the successful completion date/time of the cutover for record purpose.

4.2 Cut-over Procedures

- 4.2.1 Prior to the start of cutover, as described in Section 4.1, each Network Operator will be responsible for having all deliverables ready for service.
- 4.2.2 The RNO will have completed all provisioning and pre-provisioning activities and all the Network Operators will have all the necessary number porting data in place prior to cutover.
- 4.2.3 Within the scheduled cutover time-window, the DNO will disconnect service for the customer and the RNO will commence service activation of the customer to its network. Within the same time window, the DNO, the RNO and all other Network Operators will effect a re-route on the routing plan of the ported number.

- 4.2.4 If the porting-in mobile customer is still busy within the time-window, the DNO may force-release the existing connection of this customer, without waiting for it to be idle, to carry out the cutover.
- 4.2.5 The physical cutover and the activation of routing plan are two independent activities and could be started and finished at any time within the agreed time-window.
- 4.2.6 The RNO is responsible for the successful completion of the cutover. If, for any reason, the cutover is unsuccessful, the case will be treated as a fault. The RNO will be responsible for resolving the fault, and the DNO and other Network Operators will work closely with it to solve the problem. The RNO is also responsible for notifying the porting-in customer of the status.
- 4.2.7 If the RNO does not identify any faults or receive any fault reports from other Network Operators by a specified period after the completion of the cutover window, then the RNO will consider the cutover as successful. After successful cutover, the RNO will send a SCAPN to all Network Operators for updating all necessary records.

4.3 Service termination of a ported number

- 4.3.1 A ported number shall be regarded as relinquished when the customer's service has been terminated with the RNO for more than 3 months.
- 4.3.2 If a ported number is relinquished, the ported number should be returned to the Original DNO. This will be achieved by the RNO passing an Advice of Relinquished Ported Number (ARPN) to the Original DNO and other Network Operators. The Original DNO will then be responsible for providing appropriate call handling treatment for that number in the same manner as other non-porting numbers.
- 4.3.3 Before the Original DNO assigns a relinquished number to a customer, it should ensure that at least one regular AD cross-auditing cycle has been completed successfully.

4.4 Successive porting of a number

- 4.4.1 For a customer wishing to port the number from an old RNO to a new RNO, the procedures will be similar to those of initial porting of the number. The same procedures as specified in Sections 4.1 and 4.2 above shall be followed. The new RNO will become the "Recipient Network Operator" and the old RNO will become the "Donor Network Operator". If a successively ported number eventually ceases to be used by that customer of the new RNO and thus the number is relinquished, the ported number should be returned to the Original DNO (see Section 4.3 above).

- 4.4.2 The procedure for porting back to the Original DNO should be similar to a normal porting case, except that the directory number should no longer be classified as a working ported number in the GN databases and the ADs.

5. Fault handling procedures

- 5.1 Each Network Operator will progress its own fault handling within its own operations. If a fault requires joint investigation or the co-ordination of fault handling, Network Operators should follow **Annex E** - Exceptional Cases for Mobile Number Portability Provision to rectify the faults.
- 5.2 Each Network Operator will be responsible for its own customer base and as such will have control of any service fault reports. For ported numbers, fault handling for the ported number will be under the control of the RNO, although additional co-ordination may be required with the DNO. Such co-ordination and fault handling should follow **Annex E** - Exceptional Cases for Mobile Number Portability Provision. The RNO will work closely with the DNO and the other Network Operators to resolve any fault reports.

6. Numbering Allocations

6.1 Gateway Number

- 6.1.1 The GN refers to the called address which is sent through the POI during call set up. For ported number calls, the GN is sent instead of the ordinary DN.
- 6.1.2 Blocks of GN will be allocated to each Network Operator by the CA and the responsibility for individual GN assignment and notification will fall on the RNO (please refer to **Annex B** for GN allocation). The CA will administer the allocation of GN blocks based on the actual requirements of the Network Operators.
- 6.1.3 The format of the GN will be determined by the RNO, format as follows:

Network Number (NN) (max. 12 digits)

For example: 481 XXXXXXXXX

Number block(s) of NN will be allocated by the CA for this purpose. The NN is designed to be a separate domain from the Directory Number.

- 6.1.4 The Originating Network or Transit Network should be capable of sending any one of the above formats to the Recipient Network. The Transit Network will repeat the GN without change to the Recipient Network.

6.2 Administration

The CA will administer the assignment and allocation of NN. Details of the assignment and allocation plans are given in **Annex B**.

6.3 Change of GN

Once a mobile number has been successfully ported to the RNO, the RNO must maintain the same GN until service is terminated or the mobile number is further ported to other Network Operators. If the RNO cannot maintain the same GN, the change of GN should be allowed and the agreed procedure for change of GN should be followed. However, the cost to the requesting party for the change of GN is subject to commercial negotiation between Network Operators which is outside the scope of this document.

7. Performance Requirements

7.1 Additional call set-up delay time due to number portability

The additional call set-up delay time due to implementation of MNP should have a mean value of 3 seconds or less, and for 95% of the calls this value should not exceed 3.75 seconds.

7.2 Number Porting Capacity

7.2.1 Every Network Operator should ensure that its MNP Provider(s) and MA(s) should implement their systems and procedures to support number porting capacity of not less than the aggregated sum as outlined in Section 7.2.2.

7.2.2 The Daily Porting Thresholds¹ per day of each of the MNOs and MVNOs (serving as the RNO) are:

- (a) 3,000 ported numbers (external porting²) for MNO;
- (b) 3,000 ported numbers (internal porting³) for MNO; and
- (c) 300 ported numbers for MVNO.

¹ Daily Porting Threshold refers to the maximum count of ported numbers that an RNO (either MNO or MVNO) can attain on any working day.

² “External porting” refers to the number porting arrangement in which the RNO is different from the DNO.

³ “Internal porting” refers to the number porting arrangement in which the RNO is the same as the DNO.

- 7.2.3 Network Operators' requests for number porting should be handled by all Network Operators on a first-come-first-served principle.
- 7.2.4 The CA, according to the market need and requirement, would make appropriate revision to the number porting capacity if necessary.

Annex A**Information Exchange**

The production and exchange of all information to/from each Network Operator to complete MNP data processing is provided during the activation process mentioned in Section 4.1 of the main body of this document. During the process, the RNO will advise the DNO that a mobile number will be ported. The RNO will have to distribute an APN to all MAs. This APN will act as common advice for the Network Operators to build their routing and numbering plan. The APN must be recorded and maintained by the Network Operators.

The following information had to be included in the APN:

- APN serial number assigned by Recipient Network
- DN of the ported number
- Corresponding GN which is assigned by the RNO
- Time and date of changeover
- DNO
- RNO
- Original DNO
- Service details relating to the ported number

The detailed functional requirements for the implementation of the de-centralised AD and the associated communication link requirement is given in **Annex C** and the HKCA 2104 - Functional Specification of Administration Database for Mobile Number Portability.

Annex B**Gateway Number Allocation**

Instead of sending the original customer DN through the POI, the GN is delivered from one network to the other for implementation of MNP by database solution. The format of the GN is as follows:

NN (max. 12 digits)

NN will contain the leading digit “4” and is a number for routing purpose. Details of the allocation are given in the Numbering Plan, available at http://www.ofca.gov.hk/filemanager/ofca/en/content_311/no_plan.pdf.

The GN is designed to be a number domain totally separated from the domain of the conventional customer DN.

Annex C**Functional Requirements of Administration Database****1. Introduction**

- 1.1 In addition to the real-time GN database residing in the switching network of the Network Operators and MNP Providers, a decentralised AD is found essential to facilitate MNP by database solution.
- 1.2 The major function of the AD is to maintain the data integrity of the records kept by individual Network Operator. It also serves as a backup for the recovery of the GN Database and other ADs in case of disaster.
- 1.3 This document specifies the structure of the AD, its record format, the Information Exchange File (INF) format, inter-AD communication network for file transfer and the communication protocol used.
- 1.4 Every Network Operator should nominate one or more MNP Provider(s) and an MA(s), which may be the Network Operator itself. The Network Operator should ensure proper coordination between its MNP Provider(s) and its MA(s).
- 1.5 An MA or MNP Provider may serve more than one Network Operator.
- 1.6 Detailed requirements for implementing the AD system should be referred to the HKCA 2104 - Functional Specification of Administration Database for Mobile Number Portability.

2. Requirements of Administration Database

- 2.1 Each Network Operator is required to either set up and maintain an AD or use the AD(s) operated by its MA(s). The objectives are first to maintain data integrity among Network Operators for number portability and, secondly, to act as backup reference for disaster recovery in case of breakdown of any of the ADs.
- 2.2 The AD is decentralised in the sense that all AD copies are of the same content, but physically duplicated since each Network Operator or its MA(s) has a copy of it.
- 2.3 The AD stores all the working ported-in and ported-out numbers together with their corresponding information. History records are retained in the AD for at least 6 months. Numbers that have never been ported will not have records stored in the AD.

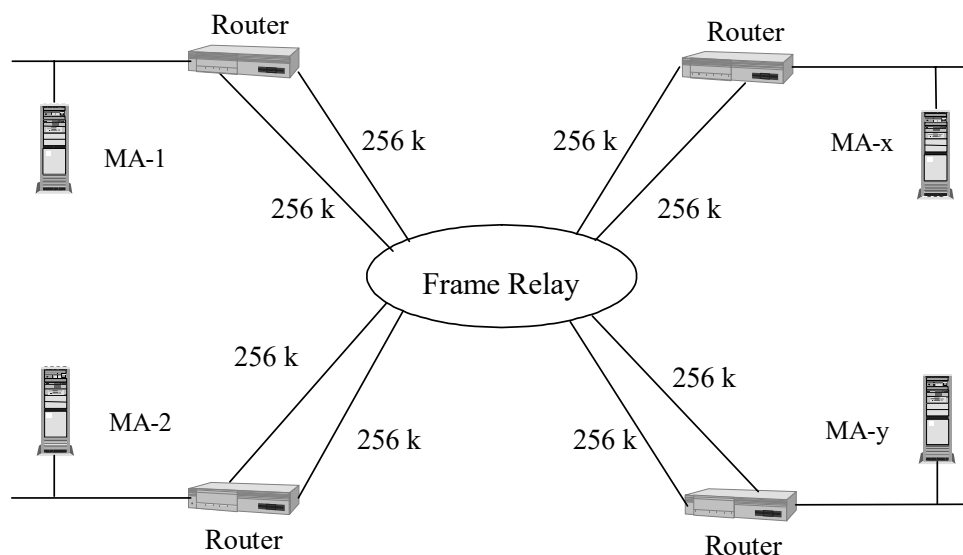
2.4 The following table shows the AD record format.

AD Field
DN
GN
RNO
DNO
Original DNO
Original Type of Service
Existing Type of Service
Changeover Date
Termination Date
RNO/DNO Reference Serial Number

3. Inter-AD Communication Network

3.1 The communications among the AD systems are via data-links by Frame Relay Permanent Virtual Circuits (PVCs). Please refer to Figure 7 below for a conceptual topology of the inter-AD communication network.

Figure 7: Inter-AD Communication Network Configuration



4. Network Security

4.1 Each MA should only allow access to its AD servers by other Network Operators or MAs by establishing a scheme of user identity (ID) and password. The Network Operators or MAs holding this information should

keep it in confidence, including authorising access to staff on a need-to-know basis only.

- 4.2 Each Sending Network Operator will assign a specific working directory in its AD server for information to be retrieved by each Receiving Network Operator. On retrieval of information from the other AD servers, the MA should only read the directories assigned to itself or its client Network Operators.

5. Communication Network Setup, Administration and Maintenance

- 5.1 Each MA should setup, administer and maintain its own AD server(s), router(s) and communication links.
- 5.2 The router(s) used should be compatible with those of other Network Operators or their MAs.
- 5.3 Addresses and masks employed should be reconciled among all Network Operators or MAs.
- 5.4 The Internet Protocol (IP) addresses and masks of the AD servers and routers, together with the Frame Relay Data Link Connection Identifier (DLCI) of the data-links, should be given to all other MAs and kept confidentially. User IDs and passwords for accessing the working directories should be given to the respective Network Operators or MAs.

6. Information Exchange File (INF)

- 6.1 Information exchange among the Network Operators or their MAs is achieved by means of INF transferred through the communication network. There is a series of IED inside each INF. The IEDs received are used to update the AD.
- 6.2 INFs are sent and received for the purposes of exchange of information during the negotiation phase, the provisioning phase, the completion phase and the termination phase.
- 6.3 The file name of an INF should adopt the following format:

Byte No.	1	2	3	4	5	6	7	8
	sending	receiving	file					
	network	network	serial					
	operator	operator	number					

. I N M

1st - 2nd byte: Sending Network Operator⁴

3rd - 4th byte: Receiving Network Operator

5th - 8th byte: File Serial Number (start from 0001)

File extension: INM for INFs

6.4 For instance, OHOB0002.INM is the second information exchange file sent from Operator H to Operator B (assuming that the two-byte network codes of Operators B and H are “OB” and “OH” respectively).

6.5 The INF has the following file format:

Header Document	IED #1	IED #2	EOF
-----------------	--------	--------	-------	-----

6.6 Each INF contains a Header Document at the beginning of the file with the following fields:

Header Fields
File Type
Creation Date
Sending Network Operator
Receiving Network Operator
Total Number of IED Enclosed
<Carriage Return>

7. Information Exchange Document (IED)

7.1 Each IED has the following format. Except for the “Comment” field, all fields are mandatory. Normally, only one IED within an INF is needed for the porting of one DN.

I E D
IED Type (see Section 8 of this Annex)
DN
GN
RNO
DNO
Original DNO
Original Type of Service
Existing Type of Service
Changeover Start Date

⁴ A list of network operators assigned with two-byte network identification codes is at **Annex F**.

Changeover Start Time
Changeover End Time
RNO/DNO Reference Serial Number
Number of Documents in a RNO/DNO Reference Serial Number
Name (see Sections 9 and 11 of this Annex)
ID Number/Passport Number (see Sections 10 and 11 of this Annex)
Comment
<Carriage Return>

8. IED Type

8.1 There are 11 IED Types:

- i) NPR (Number Portability Request)
- ii) NTNPR (Negotiation of NPR)
- iii) AKNPR (Acknowledgment to NPR)
- iv) CLNPR (Cancellation of NPR)
- v) ACNPR (Acknowledgment to CLNPR)
- vi) APN (Advice of Porting Number)
- vii) AKAPN (Acknowledgment to APN)
- viii) CLAPN (Cancellation of APN)
- ix) ACAPN (Acknowledgment to CLAPN)
- x) SCAPN (Successful Completion of APN)
- xi) ARPN (Advice of Relinquished Porting Number)

9. Name

9.1 The format and content of the “Name” field shall be made as follows, depending on the type of services of mobile numbers being ported.

Type of services of mobile numbers being ported	Format and content of the “Name” field
Post-paid service	The customer name, i.e. customer’s full name as indicated in his/her Hong Kong Identity (HKID) Card, passport or company’s name as indicated in the Business Registration Certificate (BRC) or institution’s name as indicated in the institution’s registration (hereafter collectively referred to as “Customer Name”).
Pre-paid service with SIM cards subject to RNR	The identifier “PREPAID SIM” followed by a space delimiter “ ” (i.e. 0x20) and

requirement	then Customer Name.
Pre-paid service with SIM cards <i>not</i> subject to RNR requirement	The identifier “PREPAID SIM”.

10. ID Number/Passport Number

- 10.1 The format and content of the “ID Number/Passport Number” field shall be made as follows, depending on the type of services of mobile numbers being ported.

Type of services of mobile numbers being ported	Format and content of the “ID Number/Passport Number” field
Post-paid service	Customer’s HKID Card number, Passport number or BRC number or institution’s registration number.
Pre-paid service with SIM cards subject to RNR requirement	Customer’s HKID Card number, Passport number or BRC number.
Pre-paid service with SIM cards <i>not</i> subject to RNR requirement	ICCID number.

11. Examples

- 11.1 The following table gives some examples of the format and the content of the “Name” and “ID Number/Passport Number” fields to be made for different porting scenarios.

Porting Scenario		Document Field	
Type of services of mobile numbers being ported		Name	ID Number/Passport Number
Post-paid service	Personal user	Customer’s Full Name (e.g. Chan Tai Man)	Customer’s HKID/Passport Number (e.g. A1234563)
	Corporate user	Company’s Name (e.g. ABC Limited)	Company’s BRC Number (e.g. 31234567)
	Institution user	Institution’s Name (e.g. The Institution of	Institution Registration Number

		XYZ)	(e.g. 1234567890)
Pre-paid service with SIM cards subject to RNR requirement	Personal user	“PREPAID SIM ” [Customer’s Full Name] (e.g. PREPAID SIM Chan Tai Man)	Customer’s HKID/Passport Number (e.g. A1234563)
	Corporate user	“PREPAID SIM ” [Company’s Name] (e.g. PREPAID SIM ABC Limited)	Company’s BRC Number (e.g. 31234567)
Pre-paid service with SIM cards <i>not</i> subject to RNR requirement	NA	“PREPAID SIM” (e.g. PREPAID SIM)	ICCID Number (e.g. 89852012345678901234)

12. Information Exchange Procedure

- 12.1 Information exchange files should be retrieved based on 30 minutes polling interval.
- 12.2 During a write cycle, the Sending Network Operator should write the document files on to its directory for a Receiving Network Operator. The Sending Network Operator should write document files in sequence together with a control file for that Receiving Network Operator. While a document file or a control file is being updated or created, reading of the file by the Receiving Network Operator should be blocked or disabled so that no partial or incomplete file will be received by the Receiving Network Operator.
- 12.3 In case the “Total Number of IED Enclosed” in the header document of a received INF does not match with the IEDs appended in the INF, the Receiving Network Operator should request the Sending Network Operator to retransmit the corrupted INF.

13. Information Exchange Protocol

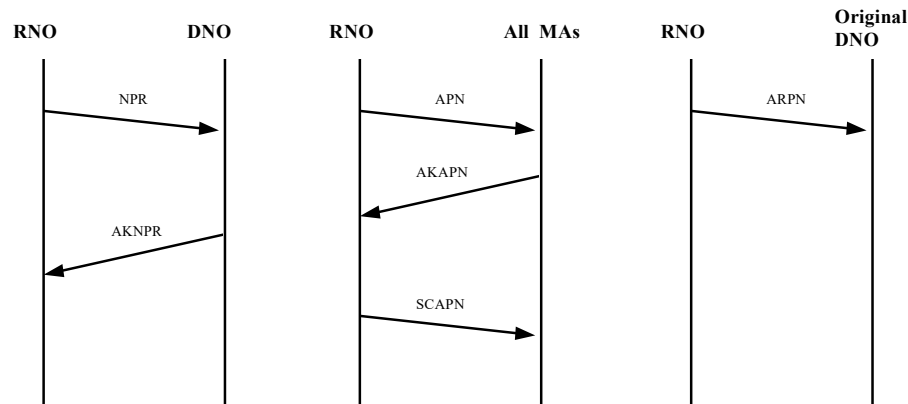


Figure 8: Negotiation Phase, Successful Negotiation

Figure 9: Provisioning Phase, Successful Provision

Figure 10: Relinquishment of Ported Number to Original DNO

14. Information Exchange Protocol for Change of GN

- 14.1 The protocol is similar to that of porting numbers. The RNO and DNO fields in the IED will indicate the same Network Operator. There is only provisioning phase in the protocol and the RNO should initiate the change by first sending out an APN at least 24 hours in advance of the expected cut-over date.

15. Cross-auditing of ADs

General

- 15.1 In order to eliminate data discrepancy among the ADs, a cross-auditing exercise is carried out every month.
- 15.2 Every MA should sort its AD using RNO as the key and generate different audit files. All working records should be included. For history records, only those generated in the previous month should be included.
- 15.3 The audit files should then be sent via the communication network to the corresponding RNO for auditing.
- 15.4 After receiving the audit file, the RNO will request its MA to compare all records inside the file with the records of its AD.

Cross-auditing Discrepancies Found

- 15.5 In case mismatch record arises, the RNO should take full responsibility to investigate and rectify the mismatch record and then inform the sending MAs for updating their ADs.
- 15.6 The following are the possible scenarios of mismatch between records received from the sending MA and the records in the AD of RNO:

Scenario	Action
Sending MA record have no corresponding record in the AD of the RNO	delete record in the sending MA's AD
RNO's AD record not in audit file	add record in the sending MA's AD
Content mismatch between the sending MA record and record in the AD of the RNO	update record in the sending MA's AD

Cross-auditing No Discrepancies Found

- 15.7 If no discrepancy is found, a rectification file should still be sent to the sending MA as confirmation of successful audit.

Cross-auditing File Format

- 15.8 The audit file, the rectification file, the verification file, and their corresponding header document have the following format:

Header Document	record #1	record #2	EOF
-----------------	-----------	-----------	-------	-----

Header Fields
File Type
Verification Date
Sending Network Operator
Receiving Network Operator
Total Number of Records Enclosed
<Carriage Return>

Annex D**Procedures for Mobile Number Portability Provision****1. INTRODUCTION**

Mobile Number Portability (MNP) is the ability for a customer to retain his/her assigned telephone numbers when changing the subscription from one mobile operator to another mobile operator. This document sets out the procedures for handling customers' MNP requests. The Office of the Communications Authority (OFCA) may, in consultation with operators, review and make appropriate changes of the contents of this Annex in order to suit the needs of operators and customers in the course of MNP implementation and provision.

2. NAMES AND DEFINITIONS**2.1 Definition of Terms**

Administration Database (AD): The off-line database that mainly performs the backup and auditing role for all ported-out and ported-in numbers, and is required to store all mobile operators' working and history records of ported-out and ported-in numbers and their corresponding information.

AD Maintenance Agent (MA): The Network Operator that is designated to be responsible for the agreed operation, administration and maintenance work of the physical AD server.

Directory Number (DN): The telephone number that is dialled by a calling party to reach the called party. If the called party is a mobile customer which has been ported from the Donor Network to the Recipient Network, this is the same as the ported number.

Donor Network: The network of the DNO.

Donor Network Operator (DNO): Operator of the mobile network from which the number is being or has been ported.

DNO MA: The MA of the DNO.

Gateway Number (GN) The database that provides translation of

Database:	the ported number to the GN.
Integrated Circuit Card Identifier (ICCID) number:	The primary account number of a SIM card as defined by the ITU-T Recommendation E.118. It is a unique identifier of a SIM card which is stored in a SIM card and, where it is a physical SIM card, is also engraved or printed on the SIM card body and its cardholder certificate.
MNP Application Form:	An official record, which may be in printed or electronic form, used by the Recipient Network Operator (RNO) for the porting request initiated by the customer. It shall contain all the information, terms and conditions as specified in Appendix of this Annex.
MNP Provider:	The Network Operator which provides number portability translation service to the Originating Network for the purpose of routing of calls to the Recipient Network. An MNP Provider may also play the role of a Transit Network if requested by the Originating Network.
Mobile Network Operator (MNO):	Licensee that holds a Unified Carrier Licence (UCL) for the provision of public mobile radiocommunications services.
Mobile Virtual Network Operator (MVNO):	Licensee that holds a Services-based Operator (SBO) Licence for the provision of mobile virtual network operator services.
Network Operator:	A licensee for the provision of fixed or mobile services (including holders of UCL (with provision of fixed or mobile service authorised)), and SBO Licence providing Class 1 or MVNO services.
Numbering Plan:	The Numbering Plan for Telecommunications Services issued by the Communications Authority (“CA”)
Original DNO:	Operator of the mobile network from which the number was first ported.

Originating Network:	The mobile or fixed network from which a call is originated.
Other MA:	The MA which is representing neither the RNO nor the DNO for the porting request.
ported number:	Mobile number of a customer which has been ported from the Donor Network to the Recipient Network.
Receiving Network Operator:	The Network Operator that retrieves information exchange files from the Sending Network Operators.
Recipient Network Operator (RNO):	Operator of the mobile network which has gained the ported number.
Recipient Network:	The network of the RNO.
RNO MA:	The MA of the RNO.
RNR requirement:	Real-name registration for SIM cards required under the Telecommunications (Registration of SIM Cards) Regulation (Cap. 106AI).
Sending Network Operator:	The Network Operator that sends information exchange files to other Network Operators.
Terminating Network:	The mobile network to which the called number is connected. This is the same as the Recipient Network.
Transit Network:	The network which is involved in carrying a call between the Originating Network and the Terminating Network but neither the Originating Network nor the Terminating Network.

3 NAMES OF INFORMATION EXCHANGE DOCUMENTS

- i) NPR (Number Portability Request)
- ii) NTNPR (Negotiation of NPR)
- iii) AKNPR (Acknowledgment to NPR)
- iv) CLNPR (Cancellation of NPR)
- v) ACNPR (Acknowledgment to CLNPR)

- vi) APN (Advice of Porting Number)
- vii) AKAPN (Acknowledgment to APN)
- viii) CLAPN (Cancellation of APN)
- ix) ACAPN (Acknowledgment to CLAPN)
- x) SCAPN (Successful Completion of APN)
- xi) ARPN (Advice of Relinquished Porting Number)

4. HANDLING OF PORTING REQUESTS

4.1 MNP Application Form

The RNO is required to use the standard MNP Application Form as an official document to record porting requests initiated by customers.

4.2 Procedures and Timings

All Network Operators should comply with the procedures for handling porting requests as laid down in relevant sections of the main body of this document and HKCA 2104 - Functional Specification of Administration Database for Mobile Number Portability. In particular, the following summary of key timings/actions should be adhered to for normal cases:

- (a) For NPRs sent during the morning session (starting from 09:00 up to 12:00) of Day 1:
 - (i) AKNPR should be sent by DNO before 16:00 on Day 1;
 - (ii) APN should be sent by RNO before 17:30 on Day 1;
 - (iii) AKAPN should be sent by all MAs before 19:00 on Day 1; and
 - (iv) The cut-over window should be 12:00-14:00 on Day 2.
- (b) For NPRs sent during the afternoon session (starting from 12:00 up to 18:00) of Day 1:
 - (i) AKNPR should be sent by DNO before 16:00 on Day 2;
 - (ii) APN should be sent by RNO before 17:30 on Day 2;
 - (iii) AKAPN should be sent by all MAs before 19:00 on Day 2; and
 - (iv) The cut-over window should be 01:00-04:00 on Day 3.
- (c) The timings listed above are the latest timings for sending the relevant documents, which in general practice should be sent as early as possible.
- (d) All timings apply to working days where every day is a working day, Monday to Sunday including public holidays except the first three days of the Chinese New Year.

4.3 **NPR**

In preparing the NPR electronic document, the RNO or its MA should not input the DNO code based on the information in the MNP Application Form. The DNO field in the NPR should be automatically generated by checking the working record of AD system and the Numbering Plan against the DN.

4.4 **Procedures for Porting Request in Typhoon and Disaster Period**

During severe weather condition/natural disasters, e.g. Tropical Cyclone Warning Signal Number 8 or higher, Black Rainstorm Warning Signal etc., the procedures laid down in **Annex E** - Exceptional Cases for Mobile Number Portability Provision should be followed.

4.5 **Lack of Response to AD Documents**

In the case where the appropriate documents within the AD system relating to a porting request are not received in accordance with the procedures laid down in relevant sections of the main body of this document and HKCA 2104 - Functional Specification of Administration Database for Mobile Number Portability, Network Operators should follow the procedures laid down in **Annex E** - Exceptional Cases for Mobile Number Portability Provision in order to expedite the delivery of the necessary document.

4.6 **Information/Actions Required on Receipt of a Porting Request**

4.6.1 **Information Required**

The RNO should ask the customer to fill in the MNP Application Form and should check the details therein. The information to be verified by the RNO and DNO.

<u>TYPES OF CUSTOMERS</u>	<u>INFORMATION TO BE VERIFIED BY THE RNO</u>	<u>INFORMATION TO BE VERIFIED BY DNO in NPR (ALLOWS REJECTION BY DNO)</u>
PERSONAL USERS INCLUDING PRE-PAID SIM SERVICE USERS WITH SIM CARDS SUBJECT TO RNR REQUIREMENT	<ul style="list-style-type: none"> • MNP Application Form with: <ul style="list-style-type: none"> ➢ Customer's full name (English and Chinese if applicable as indicated in Hong Kong Identity (HKID) Card/Passport) ➢ Customer's HKID Card number (or Passport number if appropriate) ➢ Customer's mobile number ➢ Customer's signature or one-time password (OTP) ⁵ authorisation via short message service (SMS) 	<ul style="list-style-type: none"> • Customer's full name • Customer's HKID Card number (or Passport number if appropriate) • Customer's mobile number

⁵ Customer's handwritten signature is required for MNP Application Form in paper form. For MNP application made by electronic means, digitised handwritten signature and/or SMS-based OTP shall

	<ul style="list-style-type: none"> • Copy of customer's HKID Card (or Passport if appropriate) 	
CORPORATE USERS	<ul style="list-style-type: none"> • MNP Application Form with: <ul style="list-style-type: none"> ➢ Company's name (English and Chinese if applicable as indicated on the Business Registration Certificate (BRC)) ➢ Company's BRC number ➢ Mobile number(s) authorised for porting ➢ Name, title and signature of authorised representative and company chop • Valid copy of Company's BRC (i.e. valid on day of porting request) 	<ul style="list-style-type: none"> • Company's name • Company's BRC number • Customer's mobile number(s)
INSTITUTION USERS	<ul style="list-style-type: none"> • MNP Application Form with: <ul style="list-style-type: none"> ➢ Institution's name (English and Chinese if applicable as indicated on the institution's registration) ➢ Institution's registration number ➢ Mobile number(s) authorised for porting ➢ Name, title and signature of authorised representative • Valid copy of institution's registration (i.e. valid on day of porting request, e.g. Certificate for Incorporation, Association Certificate etc.) 	<ul style="list-style-type: none"> • Institution's name • Institution's registration number • Customer's mobile number(s)
PRE-PAID SIM SERVICE USERS WITH SIM CARDS <i>NOT</i> SUBJECT TO RNR REQUIREMENT	<ul style="list-style-type: none"> • MNP Application Form with: <ul style="list-style-type: none"> ➢ Customer's mobile number ➢ Copy of cardholder certificate or SIM card showing the ICCID number if applicable ➢ Customer's signature or OTP authorisation via SMS or authorised representative's signature ➢ Declaration for loss of cardholder certificate, if applicable 	<ul style="list-style-type: none"> • Customer's mobile number • SIM card's ICCID number • The validity of the pre-paid SIM such as the expiry date of the pre-paid SIM account

Table 1: Information to be verified by RNO and DNO

4.6.2 Actions by the RNO

The RNO should take the following actions on receiving a customer who wishes to port his/her number:

- (a) Identify the following types of customers:

be affixed to the MNP Application Form for record purpose. For the avoidance of doubt, each OTP shall be used only once and expire within a short period of time. An OTP SMS message shall be sent by the RNO from designated sender addresses and shall not be forwarded to any other mobile number notwithstanding the use of SMS forwarding service or equivalent. Please refer to footnote 6 for details of designated sender addresses.

- (i) For Personal Users: by checking the information supplied on the MNP Application Form against his/her HKID Card or Passport or a copy of it.
 - (ii) For Corporate Users: by checking the information supplied on the MNP Application Form against the BRC copy.
 - (iii) For Institution Users: by checking the information supplied on the MNP Application Form against the institution's registration copy.
 - (iv) For Pre-paid SIM Service Users: for SIM cards subject to RNR requirement, by checking the information supplied on the MNP Application Form against the HKID Card / Passport or BRC (or a copy of it) and the validity of the mobile number assigned to the pre-paid SIM service; for SIM cards *not* subject to RNR requirement, by checking the validity of the mobile number and ICCID number assigned to the pre-paid SIM providing the service and the cardholder certificate / SIM card.
- (b) Identify the DNO.
 - (c) Confirm whether the customer's number is still active.
 - (d) Collect the information listed in Section 4.6.1 of this Annex.
 - (e) Highlight to the porting-in customer in detail on the MNP Application Form that the RNO would not be held responsible for any remaining liability that the porting-in customer still has with the DNO after porting in.
 - (f) Explain carefully to customer the procedure/charges involved for cancelling the porting request.
 - (g) Check internally the number of porting requests towards the Daily Porting Threshold for the cut-over window in accordance with Section 7 of this Annex and inform the customer of the proposed cut-over time.
 - (h) Request the customer to switch on the mobile phone all the time during the porting process in case it is required to inform the customer for any changes in cut-over timings, or request for additional information or details etc.

- (i) For MNP application making use of OTP authentication, the RNO shall use its designated sender address⁶ to deliver the OTP SMS message.

4.6.3 Actions by the DNO

The DNO on receipt of the NPR should check the accuracy of the DN, customer's name, HKID Card number/BRC number/institution's registration number and/or ICCID number as listed in Section 4.6.1 of this Annex against its own records⁷. In case the DN is being used for provision of mobile services offered by a licensee under the Class Licence for Offer of Telecommunications Services, the DNO should seek assistance from such licensee to verify the customer information concerned.

If the information is successfully verified, the DNO should authorise the porting by issuing the AKNPR in accordance with the relevant Sections of the main body of this document and HKCA 2104 - Functional Specification of Administration Database for Mobile Number Portability and terminate the service associated with the number during the cut-over window.

The DNO shall ensure that OTP SMS message originated from the designated sender address shall not be forwarded to any other mobile number notwithstanding the use of SMS forwarding service or equivalent by the user of the number.

4.6.4 Actions For Handling Abnormal Cases

The abnormal cases shall be handled by both the DNO and RNO in accordance with **Annex E** - Exceptional Cases for Mobile Number Portability Provision.

5. **CRITERIA FOR REJECTING/CANCELLING A PORTING REQUEST**

5.1 **By the DNO**

- 5.1.1 The DNO may reject a porting request only under the following circumstances:

- Incorrect/incomplete name of the customer in English;

⁶ RNO may specify one or more designated sender address(es) from which their OTP SMS messages will be delivered. The RNO shall maintain a list of its designated sender address(es) and circulate it with all MNOs and MVNOs, with a copy to OFCA, whenever it is updated.

⁷ Records may include DNO's internal customer records and other records kept for the purpose of RNR.

- Incorrect/incomplete HKID Card number/Passport number/BRC number/institution's registration number/cardholder certificate number/ICCID number;
- Mobile number(s) ceased to be assigned by the DNO;
- Mobile number(s) owned by different customer;
- Report of stolen/lost handset/SIM card by original customer together with a valid Police's case report identifying the case;
- Incomplete/incorrect information on the NPR sent by the RNO; or
- Double porting.

5.1.2 Specifically the DNO may not reject a porting request due to any financial, contractual or other concerns or issues it may have with the customer.

5.2 **By the RNO/Customer**

The RNO and customer may cancel a porting request in accordance with Section 6.2 of this Annex if they so wish.

5.3 **By other Network Operators**

5.3.1 **DNO's MA**

The DNO's MA may cancel a porting request (specifically an APN) if on checking it finds that the APN has no associated AKNPR or that the DN and/or cut-over window are different in the APN to the associated AKNPR. See **Annex E** - Exceptional Cases for Mobile Number Portability Provision for full details.

5.3.2 **Other MA**

All MAs must check the DNO field in APN documents against their own AD working record and the Numbering Plan. If the result is not matched, Other MA should reject the porting with the rejection code "R7".

5.3.3 **Other Network Operators**

All other Network Operators may not cancel a porting request under any circumstances except as laid down in **Annex E** - Exceptional Cases for Mobile Number Portability Provision.

6. **PROCEDURES FOR REJECTING/CANCELLING A PORTING REQUEST**

6.1 **By the DNO**

6.1.1 Under Section 5.1 of this Annex, if the DNO has due reason to reject the porting request then the DNO should respond to the NPR with an NTNPR sent to the RNO within the time frame for a normal response by AKNPR listed in Section 4.2 of this Annex. The DNO should explain in the “Comment” field of the NTNPR the reasons for the rejection by including one or more, as appropriate, of the following rejection codes:

- **A-** Reserved;
- **B-** Incorrect/incomplete name of the customer in English;
- **C-** Incorrect/incomplete HKID Card number/Passport number/BRC number/institution’s registration number/ICCID number;
- **D-** Mobile number(s) ceased to be assigned by the DNO;
- **E-** Reserved;
- **F-** Reserved;
- **G-** Reserved;
- **H-** Mobile number(s) owned by different customer;
- **I-** Report of stolen/lost handset/SIM card by original customer together with a valid Police’s case report identifying the case. The reports from customer and Police should be sent by email⁸ or fax to the RNO for information;
- **J-** Pre-paid SIM not specified;
- **K-** Incomplete/incorrect information on the NPR sent by the RNO;
- **L-** Reserved; and
- **M-** Double porting.

6.1.2 Re-sending of NPR

After receiving a NTNPR, the RNO should confirm the details of the porting request, amending them where necessary.

If the RNO wishes to continue with the porting request, it should, resend the NPR (suitably amended with a revised issue number of “B” or “C/D/E...” in the RNO/DNO Serial Number) or cancel (by sending CLNPR) and send a new NPR (for details, please refer to **Annex E** - Exceptional Cases for Mobile Number Portability Provision).

6.2 By the RNO/Customer

6.2.1 A customer who wishes to cancel a porting request must approach the RNO before 17:00 on the day before the cut-over window.

6.2.2 The RNO which wishes to cancel a porting request on its own behalf, or that of a customer, must issue the CLAPN to all MAs and a CLNPR to the DNO before 21:00 on the day before the cut-over window.

⁸ Non-personal email address should be used where appropriate.

- 6.2.3 If the cancellation request is not received by the RNO before 17:00, the porting will proceed. If the customer wishes to cancel the porting, he/she may arrange another porting request to his/her previous network.

6.3 By Other Network Operators

The procedures for other Network Operators to reject or cancel a porting request are detailed in **Annex E** - Exceptional Cases for Mobile Number Portability Provision.

7. DAILY PORTING THRESHOLD

- 7.1 Daily Porting Threshold refers to the maximum count of ported numbers that an RNO (either MNO or MVNO) can attain in the two cut-over windows on any working day.
- 7.2 The Daily Porting Thresholds for each of the MNOs and MVNOs (serving as the RNO) are shown in the table below.

	MNO		MVNO
	Daily Porting Threshold (external porting ⁹)	Daily Porting Threshold (internal porting ¹⁰)	Aggregated Daily Porting Threshold
Morning cut-over session (1:00 am to 4:00 am)	2,000	2,000	300
Afternoon cut-over session (12:00 noon to 14:00 pm)	1,000	1,000	

- 7.3 An MVNO may seek its hosting MNO(s) providing number porting arrangement through mutual agreement. The hosting MNO, representing the MVNO in such case, would be the RNO in the porting process and the count of ported numbers will be calculated towards the Daily Porting Threshold of the MNO. In case an MVNO is the RNO in the porting process, the count of ported numbers will be calculated towards the Daily Porting Threshold of the MVNO.

⁹ “External porting” refers to the number porting arrangement in which the RNO is different from the DNO.

¹⁰ “Internal porting” refers to the number porting arrangement in which the RNO is the same as the DNO.

- 7.4 The RNO should ensure the number of successful porting will not exceed the Daily Porting Threshold before it or its MA sends a new NPR.
- 7.5 Each Network Operator has to keep record for six months and has to provide a summary report to OFCA on request indicating that the number of successful porting does not exceed the Daily Porting Threshold as specified in Section 7.2 of this Annex. In case of doubt by OFCA, the RNO should explain to the satisfaction of OFCA.
- 7.6 For the sending of ARPN in the termination of ported number procedure (see relevant Sections of the main body of this document and HKCA 2104 - Functional Specification of Administration Database for Mobile Number Portability for details), it will not be considered as a successful porting and thus should not be calculated towards the Daily Porting Threshold. Same cut-over window as mentioned in Section 4.2 of this Annex should be employed. However, the updating of this relinquished number information into the GN database should be treated as low priority. It is because there is no active customer for the relinquished number and there is no service impact even if the database update is not synchronised among all GN database. However, in order to minimise the number of discrepancy during the auditing process, the database updating process for relinquished number should be completed within 6 hours before the next audit cycle after the corresponding cut-over window.

8. **DISPUTE RESOLUTION/ARBITRATION**

8.1 Each MNO shall establish some hotlines for enquiries relating to the provision of MNP in its network. Each operator should set up at least 2 levels of contacts for handling disputes. These contacts should be updated from time to time or as required.

8.2 It is the responsibility of each operator to ensure that its staff have the required training and skill for processing service orders in relation to mobile number porting and that they adhere to the agreed principles and procedures laid down in relevant documents. In case of disputes, respective operators are encouraged to resolve them bilaterally through the established level of contacts. It is essential that the implementation obstacle be cleared in the shortest time to minimise impacts on customers. If it still cannot be resolved after several attempts, the respective operator can escalate the case with sufficient details to OFCA for assistance.

8.3 **Escalation Procedures**

8.3.1 Incorrect Handling of Data

- (a) All operators must observe the Personal Data (Privacy) Ordinance (Cap. 486) in handling customers' personal data. The data provided by the porting customers are solely for the purpose of porting or complying with relevant regulatory requirements prescribed by the CA, and must not be used for any other purposes.

8.3.2 Handling of Delayed Porting Requests

- (a) In case of delayed porting requests, the RNO can ask the DNO to give valid explanations for the delay.
- (b) Both operators are encouraged to resolve the disputes bilaterally. If the disputes cannot be resolved or the RNO is not satisfied with the explanations, the RNO can escalate the case to OFCA for assistance.

8.3.3 Escalation Levels for Network Operators:

Escalation Level	Examples:
First	Frontline Supervisor
Second	Manager in charge of mobile number porting
Third	OFCA

9. **FAULT HANDLING**

9.1 **Fault Handling Principles**

- 9.1.1 Each Network Operator is responsible to handle its own faults within its own operations. If a joint effort is required, the Network Operator concerned should approach the related parties for assistance.
- 9.1.2 Each Network Operator is responsible for its own customer base and as such will have the control of its service fault reports. If coordination from other Network Operator is required, the responsible Network Operator should contact the related parties for assistance.

9.2 **Fault Handling Procedures**

9.2.1 Failure of any MA(s)' AD Server(s)

The following table summarises the workaround procedures to be employed under different failure situations: (Please refer to Section 3.1 of **Annex E** - Exceptional Cases for Mobile Number Portability Provision for details.)

Type of System Failure	Failure Duration	
	Short Duration	Long Duration
1. DNO MA's AD failure		
• negotiation phase	Normal/Abnormal Procedure	Workaround Procedure
• provisioning phase (starting from APN sent)	Normal/Abnormal Procedure	Workaround Procedure
2. RNO MA's AD failure		
• negotiation phase	Normal/Abnormal Procedure	STOP porting Request
• provisioning phase (starting from APN sent)	Normal/Abnormal Procedure	Workaround Procedure
3. Other MA's AD failure		
• provisioning phase (starting from APN sent)	Normal/Abnormal Procedure	Workaround Procedure

In general, the workaround procedures employ communication by email, fax and phone between the RNO and the affected Network Operators (associated with the failure AD system). The communication between RNO and other normal Network Operators should follow relevant procedure for handling normal and abnormal cases.

9.2.2 Data Corruption in Information Exchange File (AD Communications)

If the Receiving Network Operator suspects that an Information Exchange File is corrupted and cannot identify the root cause of the problem, it should

contact the Sending Network Operator for joint investigation and problem fixing.

9.2.3 Frame Relay Failure

- (a) For any faults discovered, the MA shall inform the Frame Relay service provider for the system failure.
- (b) In the extreme case where the two Frame Relay links or two routers failed at the same time, the porting procedure should be followed according to the AD System Failure procedure (Please refer to Section 3.1 of **Annex E** - Exceptional Cases for Mobile Number Portability Provision for details). The affected MA should notify the Other MA of this situation. The affected MA and the Frame Relay service provider should endeavour to recover at least one link as soon as possible.

9.2.4 GN Database Failure

The porting request can continue, but the owner of the GN database with failure discovered shall inform other Network Operators/MAs as soon as possible.

10. TREATMENT OF MOBILE NUMBERS

- 10.1 All mobile number levels as specified under the Numbering Plan shall be within the scope of MNP.
- 10.2 Any mobile number individually assigned to a customer shall be allowed to port out except when the assignment of that number to the customer is ceased.
- 10.3 The service of a number is considered terminated when customer is unable to use the service based on that assigned number and the associated billing of that service has been stopped. When the service of a mobile number is terminated, the assignment of that mobile number to a customer is ceased.
- 10.4 The assignment of service to ported number shall be subject to mutual agreement between the RNO and the porting-in customer.
- 10.5 A ported number shall be regarded as “relinquished” when the customer’s service with the RNO has been terminated with the RNO for more than 3 months.
- 10.6 RNO should return the “relinquished” ported number immediately to the Original DNO (i.e. original mobile operator).

- 10.7 Before the Original DNO assigns a relinquished number to a customer, it should ensure that at least one regular AD cross-auditing cycle has been completed successfully.

11. PORTING OF MOBILE NUMBERS ASSIGNED TO PRE-PAID SIM CARD USERS

- 11.1 Mobile number assigned to pre-paid SIM services can be ported from the card issuer's network to other mobile networks.
- 11.2 In completing the MNP Application Form, the customer should inform the RNO that the mobile number is from pre-paid SIM services.
- 11.3 For port-out of mobile numbers using pre-paid SIM cards subject to RNR requirement, the RNO should indicate in the "Name" field of the NPR "PREPAID SIM" followed by a space delimiter " " (i.e. 0x20) and the customer name (i.e. customer's full name as indicated in his/her HKID Card / Passport or company's name as indicated on the BRC). The DNO should verify the customer's name against its own records. For port-out of mobile numbers using pre-paid SIM cards *not* subject to RNR requirement, the RNO should indicate "PREPAID SIM" (without the customer name) in the "Name" field of NPR. Please refer to Section 11 of **Annex C** - Functional Requirements of Administration Database for examples.
- 11.4 For port-out of mobile numbers using pre-paid SIM cards subject to RNR requirement, the RNO should include the customer's HKID Card number / Passport number / BRC number (where applicable) in the "ID Number/Passport Number" field of the NPR. The DNO should verify the customer's HKID Card number / Passport number / BRC number against its own records. For port-out of mobile numbers using pre-paid SIM cards *not* subject to RNR requirement, the RNO should indicate ICCID number in the "ID Number/Passport Number" field of NPR. Please refer to Section 11 of **Annex C** - Functional Requirements of Administration Database for examples.
- 11.5 The RNO has to inform the customer that when a mobile number of a pre-paid SIM service is ported out, the residual stored value in the SIM service shall be subject to the terms and conditions of the service with the DNO. It is currently an industry practice that all remaining values on pre-paid SIM service are neither refundable nor transferable.
- 11.6 The RNO should verify the mobile number of the pre-paid SIM service by using Calling Number Display Service or any other suitable means. The DNO should facilitate the porting request by checking whether or not the service is terminated. For clarification, the mobile number of the pre-paid SIM service is considered terminated by the DNO if the pre-paid SIM service expires on the date of porting, or the porting mobile number is ceased

to be assigned to the customer. The DNO will reject a porting request if the pre-paid SIM service is terminated.

- 11.7 For those SIM cards *not* subject to RNR requirement, the customer should produce the corresponding cardholder certificate or pre-paid SIM card for verification. For record purpose, the RNO shall make a copy of the cardholder certificate or the pre-paid SIM card with the ICCID number shown. If the cardholder certificate is lost, the RNO must request the customer to declare the loss in the MNP Application Form. For the avoidance of doubt, if both the cardholder certificate and the SIM card are lost, the RNO must not accept the MNP application. The customer should contact his/her DNO for replacement of the lost cardholder certificate and pre-paid SIM card. Save for those SIM cards *not* subject to RNR requirement, the aforesaid requirements under Section 11.7 of this Annex shall be replaced with those of Sections 4.6.2 and 4.6.3 of this Annex.

Mobile Number Portability Application Form

流動電話號碼可攜服務申請表格

Customer Information 客戶資料	
Name in English 英文姓名	
Name in Chinese 中文姓名	
Mobile Number 流動電話號碼	Pre-paid SIM Service 儲值智能卡服務 Y / N 是 / 否
HKID Card No./Passport No./BRC No. 香港身份證號碼/護照號碼/商業登記證號碼	
Donor Network Operator ("DNO") 現時使用之網絡營辦商(供號網絡營辦商)	
Recipient Network Operator ("RNO") 擬轉往之網絡營辦商(受號網絡營辦商)	
Requested Cut-over Time 生效時間 <div style="text-align: right;"> <input type="checkbox"/> 01:00 – 04:00 Hrs <input type="checkbox"/> 12:00 – 14:00 Hrs </div> / / (D/M/Y)	
Declaration by Customer of Pre-paid SIM Service : (tick as appropriate) (only applicable to MNP applications for service provided by SIM cards not subject to Real-name registration requirement under Telecommunications (Registration of SIM Cards) Regulation) 儲值智能卡服務客戶聲明: (加上剔號如適用) (只適用於不須按《電訊(登記用戶識別卡)規例》實名登記的智能卡的流動電話號碼轉攜申請)	
<input type="checkbox"/> We are/I am the holder of the Cardholder Certificate / SIM Card for the Mobile Number, a copy of which is attached. 我們/我是載有上述流動電話的卡主註明書/智能卡持有人，現附上註明書/智能卡副本。	
<input type="checkbox"/> We/I have lost our/my Cardholder Certificate for the Pre-paid SIM Service associated with the Mobile Number assigned to us/me by the DNO. 我們/我已遺失由供號網絡營辦商編配給我們/我作儲值智能卡服務而載有上述流動電話號碼的卡主註明書。	
Copy of ID. Document 身份證明文件副本	
We/I accept the Terms & Conditions printed attached/overleaf Customer Signature (with Company Chop if appropriate) 我們/我接受附頁/本頁背面列印的服務條款與細則 客戶簽署(公司印鑒如適用)	Date (D/M/Y) 日期(日/月/年)
For Internal Use Only 只供本公司職員使用	

Terms & Conditions

1. Subject to the successful porting of the Mobile Number to the RNO, we/I request the DNO to terminate the voice/data/fax services on the Mobile Number with effect from the Requested Cut-over Time. The continuation of other services provided by the DNO, if any, shall be subject to the applicable terms and conditions for such services of the DNO.
2. We/I request the DNO and the RNO to effect the porting of the Mobile Number to the RNO's network with effect from the Requested Cut-over Time.
3. We/I understand that the porting of the Mobile Number does not affect our/my obligations owing to the DNO incurred prior to the successful porting of the Mobile Number under the applicable service terms and conditions of the DNO.
4. The Requested Cut-over Time is subject to the DNO's confirmation of the details herein and the technical arrangements between the DNO and the RNO in accordance with the Code of Practice related to the Implementation of Mobile Number Portability issued by the Communications Authority. For the purposes of effecting the arrangements as detailed in paragraphs 1 and 2 herein, the RNO is hereby expressly authorised to change the Requested Cut-over Time as the RNO may reasonably consider appropriate.
5. In the event that the Mobile Number cannot be ported to the RNO's network due to the incomplete, wrong or false information provided by us/me or any grounds beyond the reasonable control of the RNO, the RNO has the right to cancel this porting application.
6. Except for any liability which cannot be excluded by law, we/I agree that the DNO and the RNO will not be liable to us/me or any other party in contract, tort or otherwise for any loss or damage suffered by us/me or any other party howsoever arising from or in relation to this application and the related number porting arrangements.
7. We/I agree and authorise that our/my personal data disclosed herein may be transferred to all relevant parties who may require access to our/my personal data in connection with this application and we/I understand that we/I may request access to and corrections of our/my personal data.
8. We/I confirm and declare that all information provided herein by us/me are accurate and correct and we/I shall be wholly liable for and shall fully indemnify each of the RNO and the DNO against any costs, claims, demands, liabilities and expenses resulting from our/my breach of this clause.
9. We/I agree that no request for cancellation of this porting application will be entertained after 17:00 on the day immediately before the Requested Cut-over Time.

服務條款與細則

1. 倘若有關流動號碼成功轉攜至受號網絡營辦商，我們/我要求供號網絡營辦商於生效時間終止有關流動號碼的話音/數據/傳真服務。供號網絡營辦商如繼續提供其他服務，將受限於適用於該等服務的相關條款與細則。
2. 我們/我要求供號網絡營辦商及受號網絡營辦商於生效時間將有關流動號碼轉攜至受號網絡營辦商的網絡。
3. 我們/我明白有關流動號碼的轉攜並不影響有關流動號碼成功轉攜前我們/我在供號網絡營辦商適用的服務條款與細則下對供號網絡營辦商的責任。
4. 生效時間受供號網絡營辦商確認上述資料及供號網絡營辦商與受號網絡營辦商之間按通訊事務管理局所發出的與實施流動電話號碼可攜性有關的實務守則技術安排的限制。為上文第1及2段提及的生效安排的目的，受號網絡營辦商獲明示授權更改受號網絡營辦商合理地認為合適的生效時間。
5. 有關流動號碼若由於我們/我未有提供完整的資料，或提供錯誤或失實的資料或因非受號網絡營辦商所能合理控制的任何理由，而導致流動電話號碼無法攜帶至受號網絡營辦商的網絡，受號網絡營辦商有權取消本轉攜申請。
6. 除任何無法卸除的法律責任外，我們/我同意因本申請和相關號碼轉攜安排引致或造成我們/我或其他任何人士蒙受損失或損害，供號網絡營辦商及受號網絡營辦商均無需對我們/我或任何其他人士負上法律責任（不論是在合約、侵權或其他方面）。
7. 我們/我同意及授權我們/我在本表格披露的個人資料可能移轉予所有需要查閱我們/我在本申請所提供的個人資料的有關人士。我們/我亦明白我們/我可要求查閱及改正我們/我的個人資料。
8. 我們/我確認及聲明我們/我在本表格提供的所有資料均屬真確。如因我們/我違反本條款而導致任何訟費、申索、要求、責任及開支，我們/我須負上全部責任及向受號網絡營辦商和供號網絡營辦商作出十足賠償。
9. 我們/我同意在生效時間前一天下午五時後提出的轉攜申請取消要求將不獲受理。

Annex E**Exceptional Cases for Mobile Number Portability Provision****1. Introduction****1.1 General**

- 1.1.1 Mobile Number Portability (MNP) is the ability for customers to retain their assigned mobile telephone number when changing their subscription from one mobile operator to another mobile operator.
- 1.1.2 Licensees for the provision of fixed or mobile services (including holders of Unified Carrier Licence (with provision of fixed or mobile service authorised), and Services-Based Operator (SBO) Licence providing Class 1 or mobile virtual network operator services) (hereafter referred to as the **Network Operators**) are required to provide the function of MNP among their networks.
- 1.1.3 In order to avoid any possible uncertainty in some exceptional circumstances and also minimise any undesirable consequences in certain disastrous events in MNP provision, this document sets out the procedures and the associated responsibilities among the operators to handle these exceptional circumstances. The exceptional circumstances may include porting requests procedure, system failure, customer reported faults, auditing and maintenance window. The procedures for normal porting process and change of gateway number are mentioned in Annexes 1 and 2 of HKCA 2104 respectively.

1.2 Definition of Terms

Administration Database (AD):	The off-line database that mainly performs the backup and auditing role for all ported-out and ported-in numbers, and is required to store all mobile operator's working and history records of ported-out and ported-in numbers and its corresponding information.
AD Maintenance Agent (MA):	The Network Operator that is designated to be responsible for the agreed operation, administration and maintenance work of the physical AD server.

Directory Number (DN):	The telephone number that is dialled by a calling party to reach the called party. If the called party is a mobile customer which has been ported from the Donor Network to the Recipient Network, this is the same as the ported number.
Donor Network Operator (DNO):	Operator of the mobile network from which the number is being or has been ported.
Donor Network:	The network of the DNO.
DNO MA:	The MA of the DNO.
Gateway Number (GN) Database:	The database that provides translation of the ported number into the GN.
Integrated Circuit Card Identifier (ICCID) number:	The primary account number of a SIM card as defined by the ITU-T Recommendation E.118. It is a unique identifier of a SIM card which is stored in a SIM card and, where it is a physical SIM card, is also engraved or printed on the SIM card body and its cardholder certificate.
MNP Procedures:	Procedures for Mobile Number Portability Provision as stated in Annex D of this document.
MNP Provider:	The Network Operator which provides number portability translation service to the Originating Network for the purpose of routing of calls to the Recipient Network. An MNP Provider may also play the role of a transit network if requested by the originating network.
Original DNO:	Operator of the mobile network from which the number was first ported.
Originating Network:	The mobile or fixed network from which a call is originated.
Other MA:	The MA which is representing neither the RNO nor the DNO for porting request.
ported number:	Mobile number of a customer which has been ported from the Donor Network to the Recipient Network.

Receiving Operator:	Network	The Network Operator that retrieves information exchange files from the Sending Network Operators.
Recipient Operator (RNO):	Network	Operator of the mobile network which has gained the ported number.
Recipient Network:		The network of the RNO.
RNO MA:		The MA of the RNO.
Sending Operator:	Network	The Network Operator that sends information exchange files to other Network Operators.
Terminating Network:		The mobile network to which the called number is connected. This is the same as the Recipient Network.
Transit Network:		The network which is involved in carrying a call between the Originating Network and the Terminating Network but neither the Originating Network nor the Terminating Network.

1.3 Information Exchange

The information exchange between Network Operators includes the following documents.

- i) NPR (Number Portability Request)
- ii) NTNPR (Negotiation of NPR)
- iii) AKNPR (Acknowledgment to NPR)
- iv) CLNPR (Cancellation of NPR)
- v) ACNPR (Acknowledgment to CLNPR)
- vi) APN (Advice of Porting Number)
- vii) AKAPN (Acknowledgment to APN)
- viii) CLAPN (Cancellation of APN)
- ix) ACAPN (Acknowledgment to CLAPN)
- x) SCAPN (Successful Completion of APN)
- xi) ARPN (Advice of Relinquished Porting Number)

Negotiation Phase

Document	Description	Sender Address	Receiver Address
NPR	Number Portability Request	RNO	DNO
CLNPR	Cancellation of NPR	RNO	DNO
AKNPR	Acknowledgment to NPR	DNO	RNO
ACNPR	Acknowledgment to CLNPR	DNO	RNO
NTNPR	Negotiation of NPR	DNO	RNO

Provisioning and Completion Phase

Document	Description	Sender Address	Receiver Address
APN	Advice of Porting Number	RNO	All MAs
SCAPN	Successful Completion of APN	RNO	All MAs
CLAPN	Cancellation of APN	RNO/MA	All MAs/RNO
AKAPN	Acknowledgment to APN	All MAs	RNO
ACAPN	Acknowledgment to CLAPN	All MAs/RNO	RNO/MA

Termination Phase

Document	Description	Sender Address	Receiver Address
ARPN	Advice of Relinquished Ported No.	RNO	Original DNO, All MAs

2. Abnormal Cases**2.1 NPR Corrupted in Transmission**

- 2.1.1 On receipt of a NPR, the DNO should verify that the data within the NPR still conforms to the format of an Information Exchange Document. If it does not, it is considered that the NPR may be corrupted in transmission and the DNO should reply to the RNO with a NTNPR. If the data is corrupted to the extent that it is not possible to identify the RNO (i.e. the Sending Network Operator), the DNO should not reply to the NPR and the late document procedure detailed in Section 2.11 of this Annex should be instigated by the RNO. If the DNO can identify the sender (by file name or Frame Relay (FR) connection) from the corrupted document files, the DNO should inform the RNO immediately.

2.2 Incorrect or Incomplete Data in the NPR or in the Required Documents

2.2.1 On receipt of a NPR, the DNO should check the necessary data, according to the MNP Procedures, to verify the porting request. In the case where the data is either incorrect or incomplete, the DNO should send a NTNPR to the RNO. The DNO should specify one or more of the following rejection codes, the reasons for the rejection in bracket in the “Comment” field of NTNPR.

- A- Reserved
- B- Incorrect/incomplete name of the customer in English
- C- Incorrect/incomplete Hong Kong Identity Card number /Passport number/Business Registration Certificate number /Institution's registration number/ICCID number
- D- Mobile number(s) ceased to be assigned by the DNO
- E- Reserved
- F- Reserved
- G- Reserved
- H- Mobile number(s) owned by different customer
- I - Report of stolen/lost handset/SIM card by original customer together with a valid Police's case report identifying the case. The report from customer and Police should be sent by email or fax to the RNO for information
- J- Pre-paid SIM not specified
- K- Incomplete/incorrect information on the NPR sent by the RNO
- L- Reserved
- M- Double Porting

2.2.2 After receiving a NTNPR, the RNO should confirm the details of the porting request, amending them where necessary.

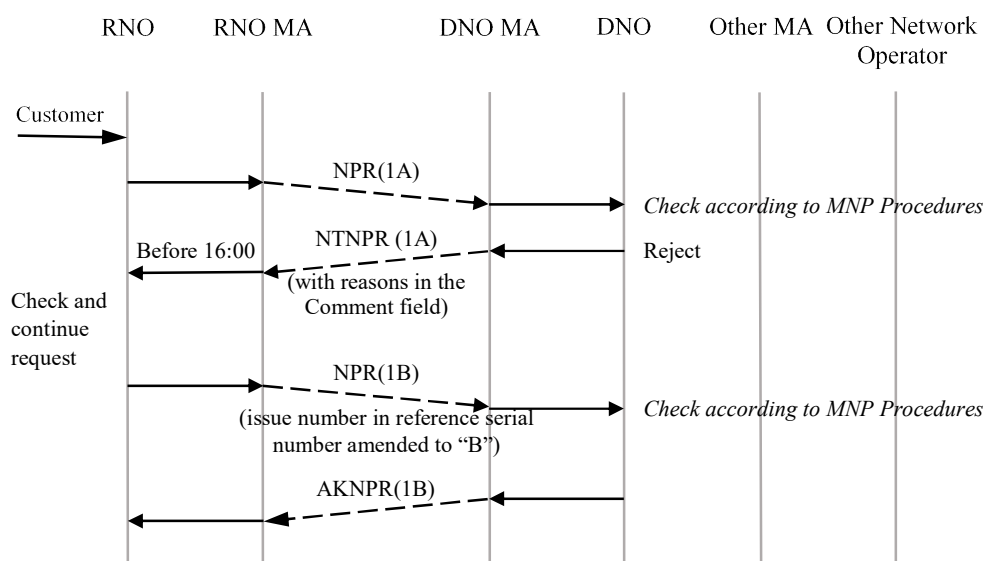


Figure 11: Porting Procedure (Rejected by DNO - Case 1)

- 2.2.2.1 If the RNO wishes to continue with the porting request, it should cancel (by sending CLNPR) the original NPR and send a revised NPR as shown in Figure 12.

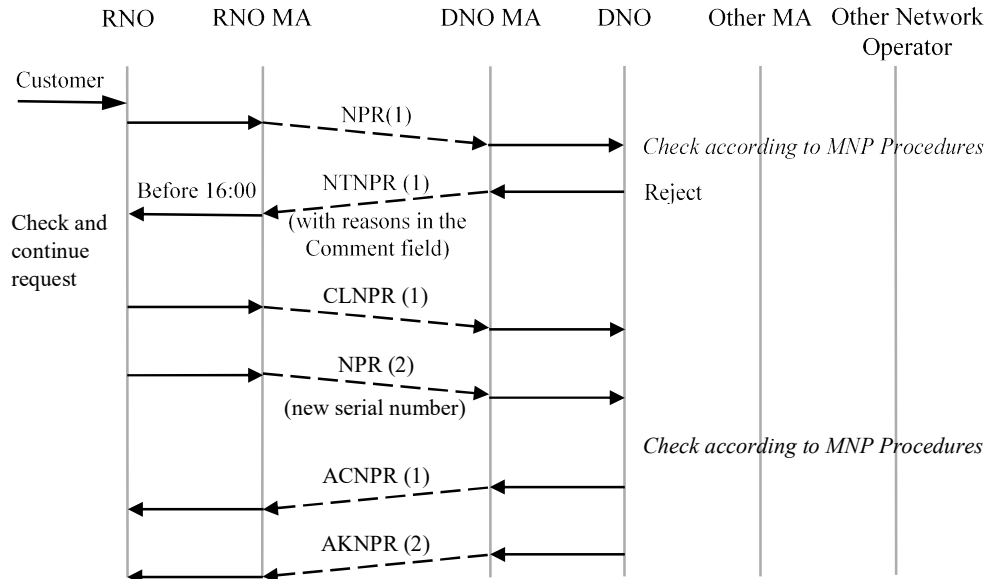


Figure 12: Porting Procedure (Rejected by DNO - Case 2)

- 2.2.2.2 In the event that the revised NPR is sent outside the NPR session that the first NPR was sent in, the cut-over window will be delayed. The customer should be contacted by the RNO and informed of the situation. The revised NPR (with new issue number “B”) is still applicable to the case where change of cut-over window is required. If there are more than one revised NPR for one single porting, the issue number will suitably be amended to “C”, “D”, “E” etc.
- 2.2.2.3 If the RNO cannot satisfy the data requirements for porting request, the RNO should cancel the NPR by issuing a CLNPR.

2.3 Cancellation of Porting Request by RNO

In accordance with the MNP Procedures, the RNO may cancel the porting request before 21:00 on the day before the cut-over window. If the RNO wishes to cancel the porting request, it should follow the procedures outlined for different scenarios below:

2.3.1 Cancellation before reception of AKNPR/NTNPR

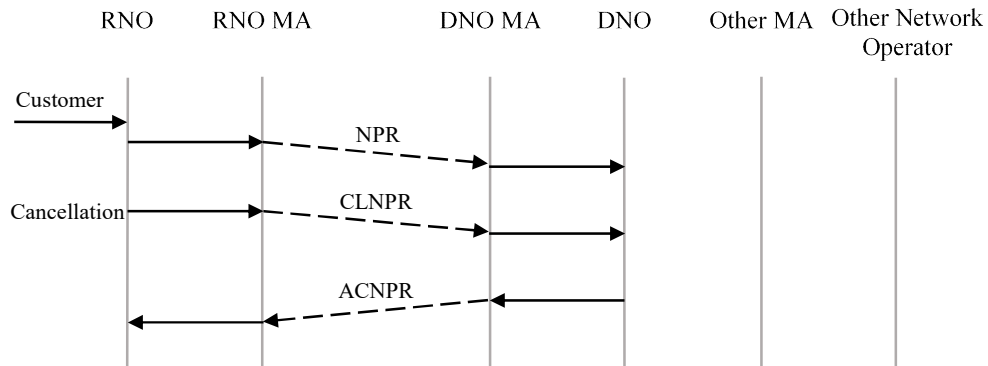


Figure 13: Porting Procedure (Cancelled by RNO - Case 1)

2.3.2 Cancellation before sending of APN

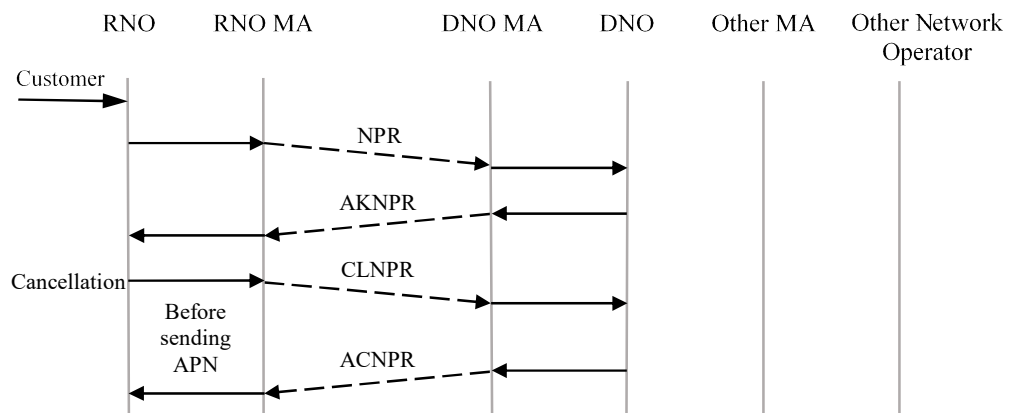


Figure 14: Porting Procedure (Cancelled by RNO - Case 2)

2.3.3 Cancellation after sending of APN.

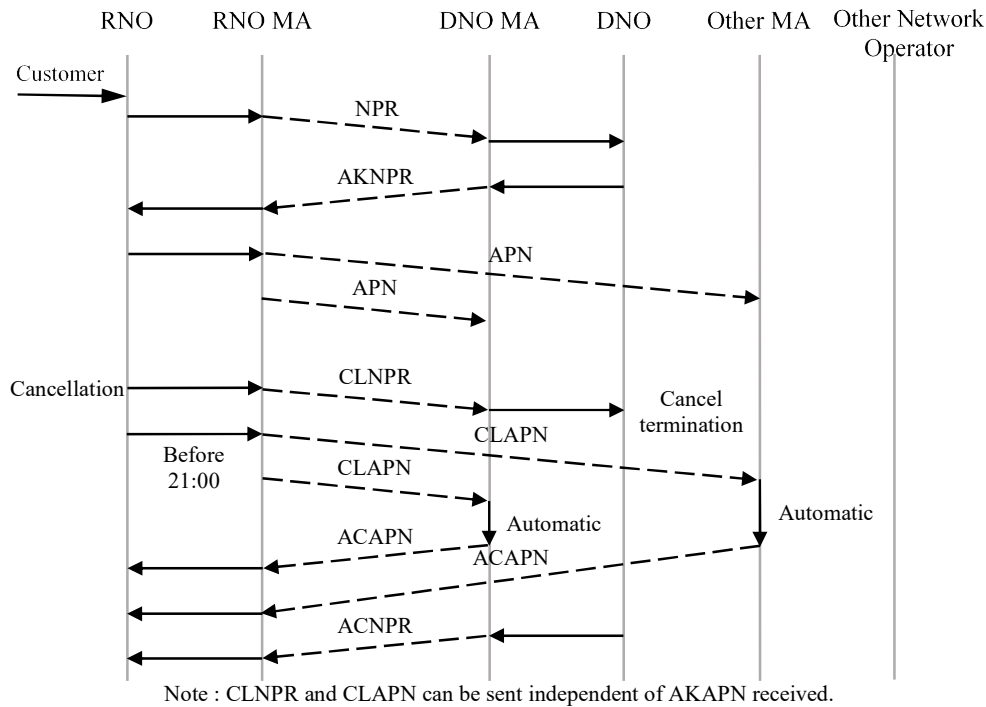


Figure 15: Porting Procedure (Cancelled by RNO - Case 3)

2.4 AKNPR

- 2.4.1 The AKNPR is generated from the respective NPR by modifying the “IED Type” and/or “Comment” fields to avoid human error.
- 2.4.2 The RNO should check the AKNPR against the NPR for validity.
- 2.4.3 If the data is corrupted in the transmission, the RNO should request retransmission from the DNO by phone. If the subsequent sending of the AKNPR falls outside of the normal AKNPR time limit (i.e. 16:00), the late document procedure detailed in Section 2.11 of this Annex should be followed.

2.5 APN

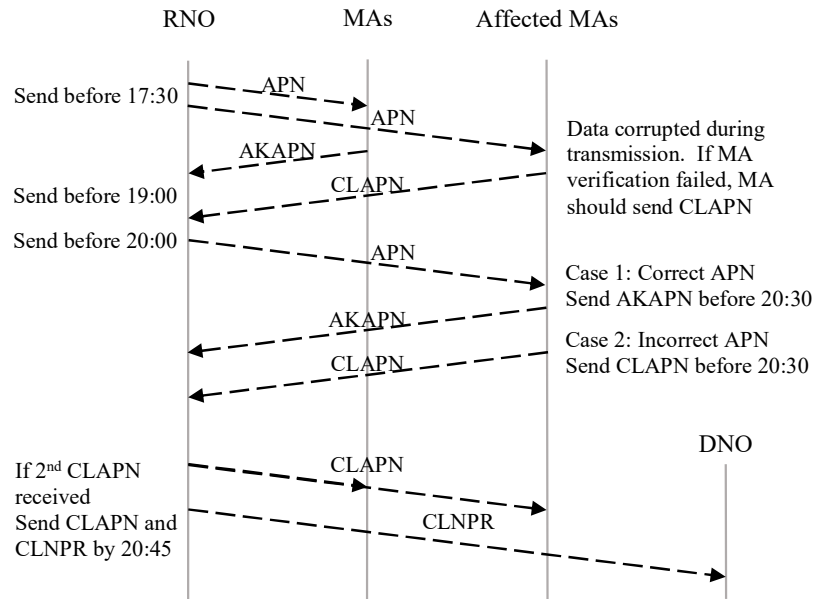


Figure 16: MNP Abnormal Cases - Error in APN

- 2.5.1 The APN is generated from the respective AKNPR by modifying the “IED Type”, “GN” and/or “Comment”. In cases of change in GN number, the AD system must allow for APN to be entered manually (i.e. not generated from AKNPR) providing that the RNO and DNO are the same.
- 2.5.2 Before sending the APN the RNO must check:
- GN is valid
 - APN is verified against AKNPR specially the DN and the cut-over window
- 2.5.3 On receipt of the APN, all MAs should conduct the following simple checks for verification of the data in APN:
- NI or NN in GN against RNO
 - a legitimate cut-over window
 - The cut-over date is either one or two day after the APN receipt date
 - The cut-over window is either 01:00-04:00 or 12:00-14:00
 - DNO should be same as the RNO at AD working record or same as the Original DNO if no AD working record available
- 2.5.4 The DNO may arrange (not a mandatory requirement) to verify the following details in the APN against the DNO’s associated AKNPR:
- DN
 - cut-over window

- 2.5.5 If an individual MA's checks are successful then the individual MA should automatically respond with AKAPN.
- 2.5.6 If an individual MA's checks are unsuccessful then the individual MA should send the RNO a CLAPN (within the timeframe for an AKAPN) and include in the "Comment" field of the CLAPN the reason for the rejection of the APN by using one or more of the following rejection codes, followed by the reasons for the rejection in bracket.
- R1 - Data corrupted - completely corrupted APN
 - R2 - Data corrupted - inaccurate GN
 - R3 - Data corrupted - inaccurate cut-over window
 - R4 - No associated AKNPR
 - R5 - Mismatch with AKNPR - inaccurate DN
 - R6 - Mismatch with AKNPR - inaccurate cut-over window
 - R7 - Wrong DNO
- 2.5.7 If the received APN is corrupted to the extent that it is not possible to identify the RNO, then the MA should not reply to the APN and the late document procedure detailed in Section 2.11 of this Annex should be instigated by the RNO.
- 2.5.8 The affected MA should make reasonable efforts to approach the RNO to resolve the issues and allow the porting to proceed as planned.
- 2.5.9 On receipt of a CLAPN, the RNO should check the APN and then re-send it to the affected MA(s) within the "fault" timeframe, before 20:00.
- 2.5.10 On receipt of the re-sent APN, the individual MA should conduct simple verification checks detailed in Section 2.5.3 and Section 2.5.4 of this Annex if appropriate. If the checks are successful then the affected MA(s) should reply with an AKAPN within the "fault" timeframe before 20:15. If checks continue to be unsuccessful then the individual MA should reply to the RNO with a CLAPN before 20:15.
- 2.5.11 If the RNO receives a second CLAPN from the same affected MA then the RNO should before 21:00 send a CLAPN to all MAs and a CLNPR to the DNO.

2.6 AKAPN

- 2.6.1 The AKAPN is to be generated from the respective APN by modifying the fields "IED Type" and/or "Comment" following the simple verification checks as detailed in Section 2.5.3 of this Annex.
- 2.6.2 On receipt of AKAPN the RNO should conduct the verification checks detailed in Section 2.5.3 of this Annex. If the data has been corrupted in

transmission then the RNO should request by phone the MA sending the AKAPN to re-send it.

2.7 SCAPN

2.7.1 The SCAPN is to be generated from the respective APN by modifying the fields “IED Type” and/or “Comment”.

2.7.2 On receipt of SCAPN, MAs should conduct the verification checks detailed in Section 2.5.3 of this Annex. If the data has been corrupted then the MA should request the RNO by phone to re-send the SCAPN.

2.8 CLNPR

2.8.1 The CLNPR should be generated from the respective NPR by the RNO.

2.8.2 If the data in the CLNPR is corrupted in transmission then the DNO should request the RNO by phone to re-send it.

2.9 CLAPN

2.9.1 The CLAPN should be generated from the respective APN, with the reasons for rejecting the APN added (refer to Section 2.5.6 of this Annex for details).

2.9.2 If the data in the CLAPN is corrupted in transmission then the receiving party should request the sending party to re-send it.

2.10 ARPN

2.10.1 The ARPN should be generated from the AD working records by the latest RNO.

2.10.2 All the MAs should verify whether the sender of the ARPN matches with the RNO field of the corresponding AD working record. If there is an error, the MA should contact the sender of the ARPN to rectify the issue.

2.10.3 If the Original DNO in the ARPN finds out that the relinquished number does not belong to them, it may contact the sender of the ARPN to rectify the issue.

2.10.4 In general, if the data in the ARPN is corrupted in transmission, the relevant parties should contact each other by phone to rectify the situation.

2.11 Late Document

- 2.11.1 The RNO should chase up late AKNPRs and NTNPRs by phone and DNO to ensure that it is sent by 18:00 such that the APN and AKAPN can be handled during the “fault” timeframes detailed in Sections 2.5.9 and 2.5.10 of this Annex.
- 2.11.2 The RNO should chase up late AKAPNs and CLAPNs by phone with individual MAs.

2.12 Authority to Reject/Cancel Porting

- 2.12.1 The authority to reject and cancel portings should be referred to the MNP Procedures.

2.13 Severe Weather Arrangement

- 2.13.1 Severe weather conditions shall be deemed to exist from the official time of hoisting to the official time of lowering of the following severe weather warning signals by the Hong Kong Observatory:

- Black Rainstorm Warning Signal
- Tropical Cyclone Warning Signal Number 8 or higher

- 2.13.2 When severe weather conditions exist, all network operators should handle porting requests as follows:

2.13.2.1 NPR not sent by RNO

The RNO should cease sending new NPRs. This may cause a delay in the cut-over window proposed to the customer. The RNO is responsible for informing the customer of the situation.

2.13.2.2 NPR sent but APN not sent

The sending of AKNPR by DNO or APN by RNO will be stopped during the period of severe weather condition. The RNO should stop the porting request by cancelling the NPR by CLNPR for completeness and inform the customers accordingly. The RNO should issue a new NPR with a revised cut-over time after the severe weather condition has ended.

2.13.2.3 After the APN has been sent

The porting request handling should proceed and be completed in the normal fashion.

3. Handling of Porting Request in Different System Failure Cases

3.1 AD System Failure

General

- 3.1.1 All Network Operators should handle porting request in accordance with the agreed response time as stated in the Normal/Abnormal Porting Procedure¹¹. If there is system failure in the AD system and the affected Network Operators find that using Normal/Abnormal Porting Procedure will be unable to meet the agreed response time, the workaround procedures defined in this section should be employed. As soon as the fault is detected, the affected MA should notify all other Network Operators that there is an AD system failure in their system. All the Network Operators should arrange necessary resources for the possible workaround procedures.
- 3.1.2 The failure situations can be classified into three cases:
- 3.1.2.1 Short Duration Failure: The failure duration is so short that the affected Network Operators can meet the agreed response time within the Normal/Abnormal Porting Procedure using the recovered AD system.
- 3.1.2.2 Long Duration Failure: The failure AD system cannot be recovered within a short time and the affected Network Operators may be unable to meet the agreed response time within the Normal/Abnormal Porting Procedure using the AD system. In this situation, the workaround procedures defined in this section should be employed in order to meet the agreed cut-over time for the porting requests. The affected MA should work with the relevant MNP Provider and Network Operator(s) to update the porting data into the GN database as soon as possible.
- 3.1.2.3 Disaster Situation: The AD system is in failure for quite a long time and workaround procedure has been employed. This situation should be escalated to the Office of the Communications Authority (OFCA) and OFCA will handle the situation on a case by case basis.
- 3.1.3 Irrespective of the duration of AD system failure, the affected Network Operator is required to send back the AD electronic documents, despite the adoption of the manual workaround procedure prior to system resume normal, even if they can still catch the agreed response time within the Normal/Abnormal Porting Procedure.

¹¹ Normal/Abnormal Porting Procedure refers to the relevant working procedures for handling porting requests for normal and abnormal cases as mentioned in this document and HKCA 2104 - Functional Specification of Administration Database for Mobile Number Portability.

Workaround Procedure

- 3.1.4 The following table summarises the workaround procedure to be employed under different failure situations:

Type of System Failure	Failure Duration	
	Short Duration	Long Duration
1. DNO MA's AD failure		
negotiation phase	Normal/Abnormal Procedure	Workaround Procedure (see Figure 17)
provisioning phase (starting from APN sent)	Normal/Abnormal Procedure	Workaround Procedure (see Figure 17)
2. RNO MA's AD failure		
negotiation phase	Normal/Abnormal Procedure	STOP porting Request (see Figures 18 and 19)
provisioning phase (starting from APN sent)	Normal/Abnormal Procedure	Workaround Procedure (see Figure 20)
3. Other MA's AD failure		
provisioning phase (starting from APN sent)	Normal/Abnormal Procedure	Workaround Procedure (see Figure 21)

Table 3-1: Workaround Procedure

In general, the workaround procedures employ communication by email/fax and phone between the RNO and the affected Network Operators (associated with the failure AD system). The communication between RNO and other normal Network Operators should follow that of Normal/Abnormal MNP Porting Procedure as far as possible.

3.1.4.1 DNO MA's AD Failure during Negotiation Phase and/or Provisioning Phase

Under this failure situation, DNO should confirm with RNO on the porting request by email/fax and inform DNO MA of the confirmed porting numbers by email/fax. The communication between RNO and other MAs should follow that of Normal/Abnormal MNP Porting Procedure. The workaround procedure is shown in the following diagram:

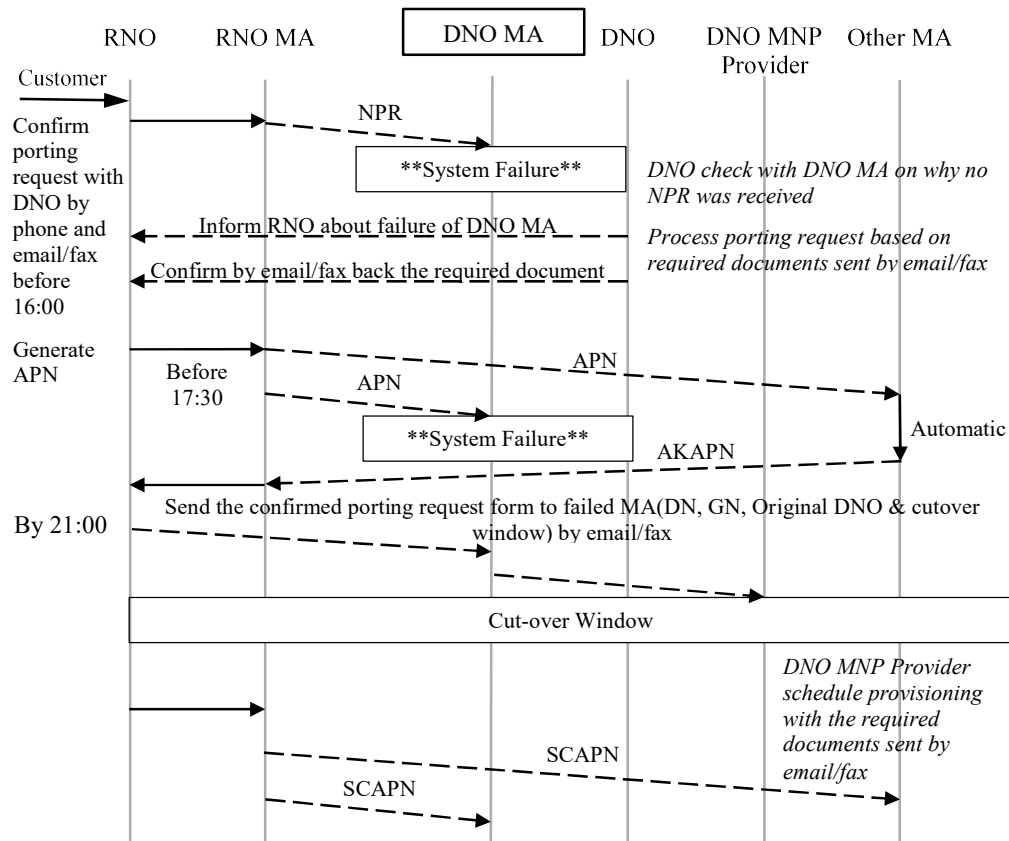


Figure 17: Porting Procedure (System Failure in DNO MA)

- 3.1.4.2 RNO should email/fax the Transaction Form to DNO and send NPR document to DNO. However, as AD system of DNO MA is in failure, DNO cannot retrieve the NPR document. DNO should go ahead with checking of porting request based on the received MNP Transaction form and should inform RNO about the failure of AD system of DNO MA. DNO should confirm the porting request with RNO by returning the MNP Transaction Forms to the RNO with corresponding information (accept or reject with reasons) before the agreed deadline of normal porting procedure.
- 3.1.4.3 After reception of the confirmation, RNO should generate from NPR and send out the corresponding APN to all MAs (including DNO MA).
- 3.1.4.4 Furthermore, by 21:00 of the day before cut-over window, RNO has to send a Confirmed Porting Request form by email/fax to the DNO MA containing all “Confirmed Porting Request”. “Confirmed Porting Request” refers to porting request generated from the RNO which has not been rejected/cancelled by any related parties. The format of the content of the email/fax is shown as follows:

From RNO	YY		
To DNO MA	XX		

Confirmed Porting Request			
Cutover Window	DD-MM-YYYY am		
Total number of Porting Request : xxxx			
DNO 1	DN	GN	Original DNO
1	DN1	GN1	ODNO1
2	DN2	GN2	ODNO2
3	DN3	GN3	ODNO3
4	DN4	GN4	ODNO4
5	DN5	GN5	ODNO5
DNO 2			
1	DNi	GNi	ODNOi
2	DNii	GNii	ODNOii
3	DNiii	GNiii	ODNOiii
Cutover Window	DD-MM-YYYY pm		
Total number of Porting Request : xxxx			
DNO 1	DN	GN	Original DNO
1	DN1	GN1	ODNO1
2	DN2	GN2	ODNO2
3	DN3	GN3	ODNO3
4	DN4	GN4	ODNO4
5	DN5	GN5	ODNO5
DNO 2			
1	DNi	GNi	ODNOi
2	DNii	GNii	ODNOii
3	DNiii	GNiii	ODNOiii

Table 3-2: Confirmed Porting Request Form

3.1.4.5 RNO MA's AD Failure during Negotiation Phase

If failure of the RNO MA's AD system occurs before the sending of APN, RNO should cancel the porting request with DNO by phone and by email/fax. Some possible cases are shown in the following diagrams:

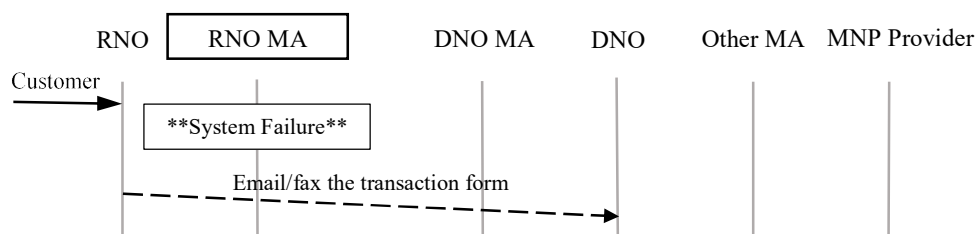


Figure 18: Porting Procedure (System Failure in RNO MA - Case 1)

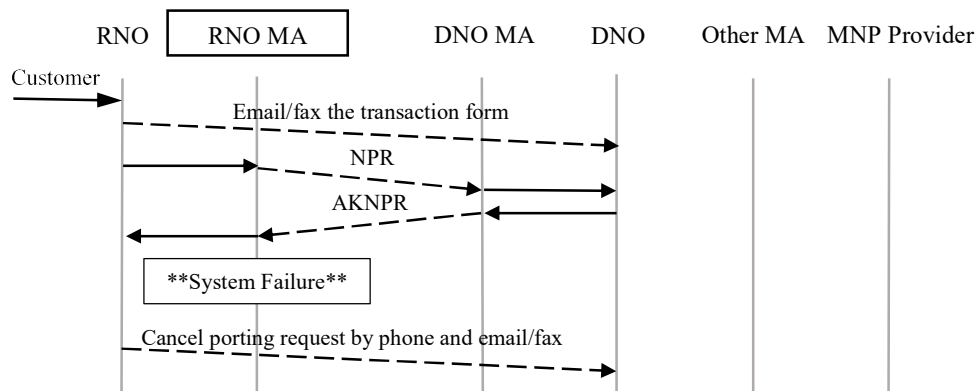


Figure 19: Porting Procedure (System Failure in RNO MA - Case 2)

From RNO	YY	
To DNO	XX	
Cancelled Porting Request		
Cutover Window	DD-MM-YYYY am/pm	
Total Number	XXXX	
DNO 1	<u>DN</u>	<u>GN</u>
1	DN1	GN1
2	DN2	GN2
3	DN3	GN3
4	DN4	GN4
5	DN5	GN5

Table 3-3: Cancelled Porting Request Form

3.1.4.6 RNO MA's AD Failure during Provisioning Phase

If failure of RNO MA's AD system occurs after APN is sent out, RNO should confirm with DNO MA and other MAs by phone and email/fax (with format of Table 3-4) that porting can still go ahead. If some APNs are rejected, corresponding MA should send the Rejected Porting Request Form of associated DN with reason code to RNO by email/fax (with format of Table 3-5). If the RNO and corresponding MA cannot rectify the reason for rejection within the abnormal case time frame, the RNO should cancel the APN with all MAs by email/fax and phone (with format of Table 3-6) and the corresponding DNO by phone and email/fax (with format of Table 3-7) by 21:00.

The formats of the email/fax are shown as follows:

From RNO	YY		
To MA	XX		
List of APN			
Cutover Window	DD-MM-YYYY am		

Total number of APN : xxxx			
DNO 1	DN	GN	Original DNO
1	DN1	GN1	ODNO1
2	DN2	GN2	ODNO2
3	DN3	GN3	ODNO3
4	DN4	GN4	ODNO4
5	DN5	GN5	ODNO5
DNO 2			
1	DNi	GNi	ODNOi
2	DNii	GNii	ODNOii
3	DNiii	GNiii	ODNOiii
Cutover Window	DD-MM-YYYY pm		
Total number of APN : xxxx			
DNO 1	DN	GN	Original DNO
1	DN1	GN1	ODNO1
2	DN2	GN2	ODNO2
3	DN3	GN3	ODNO3
4	DN4	GN4	ODNO4
5	DN5	GN5	ODNO5
DNO 2			
1	DNi	GNi	ODNOi
2	DNii	GNii	ODNOii
3	DNiii	GNiii	ODNOiii

Table 3-4: List of APN Form

From MA	YY	
To RNO	XX	
Rejected Porting Request:		
Cutover Window	DDMMYYYY am	
Total Number of Rejecting Porting Request : xxxxxx		
	DN	Rejection Code
1	DNa	Rejection Code x
2	DNb	Rejection Code y
3	DNc	Rejection Code x
Cutover Window	DDMMYYYY pm	
Total Number of Rejecting Porting Request : xxxxxx		
	DN	Rejection Code
1	DNa	Rejection Code x
2	DNb	Rejection Code y

Table 3-5: Rejected Porting Request Form to RNO

From RNO	YY	
To MA	XX	
Cancelled porting request:		
Cutover Window	DD-MM-YYYY am	
Total number of cancelled request: xxxxxx		
DNO 1	DN	GN
1	DN1	GN1
2	DN2	GN2
3	DN3	GN3
4	DN4	GN4
5	DN5	GN5
DNO 2		
1	DNi	GNi
2	DNii	GNii
3	DNiii	GNiii
Cutover Window	DD-MM-YYYY pm	
Total number of cancelled request: xxxxxx		
DNO 1	DN	GN
1	DN1	GN1
2	DN2	GN2
3	DN3	GN3
4	DN4	GN4
5	DN5	GN5
DNO 2		
1	DNi	GNi
2	DNii	GNii
3	DNiii	GNiii

Table 3-6: Cancelled Porting Request Form to all MAs

From RNO	YY	
To DNO	XX	
Cancelled porting request:		
Cutover Window	DD-MM-YYYY am	
Total number of cancelled request: xxxxxx		
	DN	GN
1	DN1	GN1
2	DN2	GN2
Cutover Window	DD-MM-YYYY pm	
Total number of cancelled request: xxxxxx		
	DN	GN
1	DN1	GN1

2	DN2	GN2

Table 3-7: Cancelled Porting Request Form to DNO

The procedure is summarised in the following diagram:

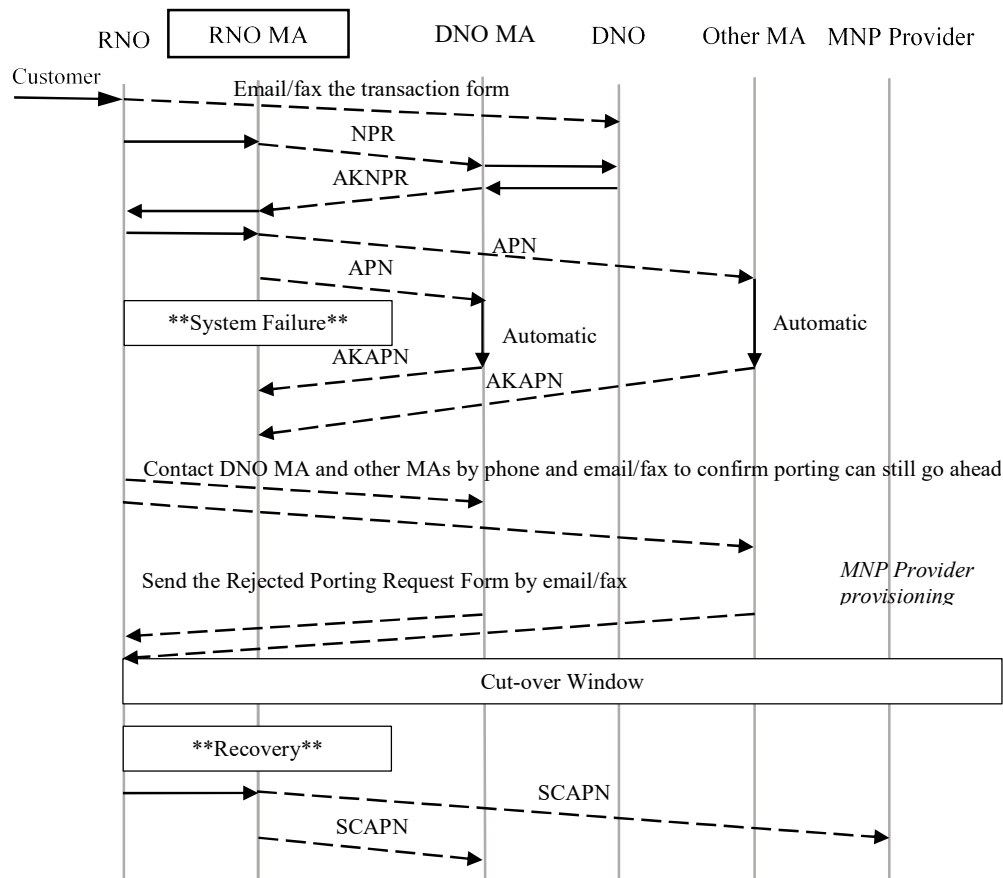


Figure 20: Porting Procedure (System Failure in RNO MA - Case 3)

3.1.4.7 Other MA's AD Failure during Provisioning Phase

If failure of AD system(s) of other MA(s) occurs during the provisioning phase, RNO should confirm with the affected MA by phone and email/fax that porting can still go ahead. Furthermore, by 21:00 of the day before cut-over window, RNO has to send a Confirmed Porting Request Form to the affected MA containing all "Confirmed Porting Request". The format of the "Confirmed Porting Request" is the same as that in Section 3.1.4.4 of this Annex.

The procedure is summarised in the following diagram:

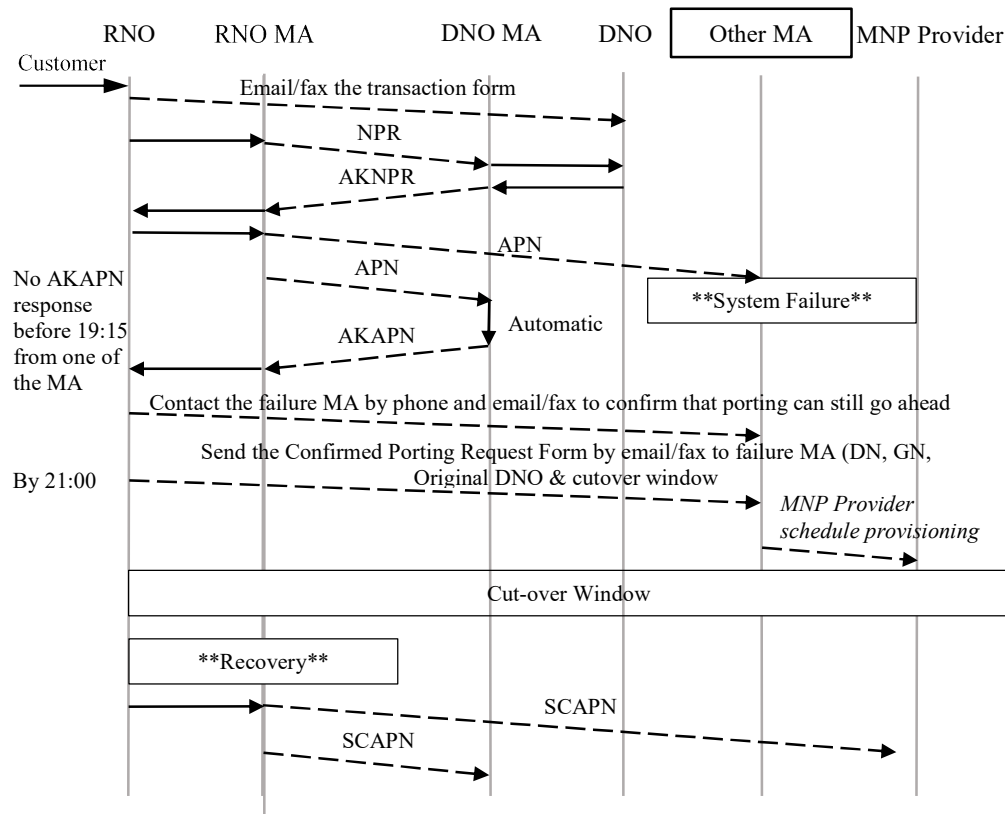


Figure 21: Porting Procedure (System Failure in Other MA)

3.2 GN Database System Failure

- 3.2.1 For partial or total system failure of the GN database, the related MNP Provider should fix the problem as soon as possible.
- 3.2.2 Other MAs and MNP Providers will continue with the porting process. The new porting number will be updated into the affected GN database as soon as possible after system recovery.

3.3 Inter AD Network Failure

General

- 3.3.1 To maintain high availability of the inter-AD network, it is required that all MAs to equip two routers (one router for back-up purpose) for connection to the FR network. The AD system is connected to the FR network via two links for MNP information file retrieval. This configuration provides better reliability. Under this configuration, the likely failure scenarios are to be handled as follows:

Single Link / Router Failure

- 3.3.2 The traffic will be arranged to route to the other link/router and no impact to the operations of affected AD server.

Double Links / Routers Failure

- 3.3.3 In the extreme case where the two FR links or two routers failed at the same time, the porting procedure should be followed according to the AD System Failure procedure in Section 3.1 of this Annex. The affected MA should notify the other MA of this situation and try its best to recover at least one link as soon as possible.

3.4 AD to GN Communication Failure

- 3.4.1 Communication between the AD and GN databases is an internal issue for the network operator(s) providing the MA and MNP Provider functions. Any failure in the communications between the databases is an internal operation and the porting process will continue. Porting requests will be updated into the affected GN database as soon as possible.
- 3.4.2 If GN updating cannot be completed for a porting request within the relevant cut-over window, GN Operator is required to give notification to RNO by email/fax and phone. GN Operator is responsible for taking immediate remedial action for GN updating as soon as possible.

4. Customer Reported Faults

- 4.1 The handling of Fault investigation should refer to Appendix “Request for MNP Fault Investigation/Modification”. Manual adjustment of system record should only be considered if situation cannot be rectified through the normal handling procedure.

5. Exceptional Cases Following Audit Verifications and Ad Hoc Audit**5.1 Disputes in the Rectification Files**

- 5.1.1 In case dispute is found affecting the entire data file (file dispute), the comparison/rectification process should be aborted immediately. Any changes made in the rectification should be rolled back. The case must be reported to the MA who generated the file and the MA must resolve the problem as soon as possible.
- 5.1.2 If the dispute is found in a particular record (record dispute), just simply ignore the record and continue the process. These erroneous records must be then forwarded to the MA who generated the file and the MA must resolve the problem as soon as possible.

5.2. Ad Hoc Auditing

- 5.2.1 Following a major AD system failure, a network operator may request an ad hoc audit outside the normal auditing time table. All network operators should comply with such request in good faith.

6. Maintenance Window

- 6.1 A maintenance window starting from 22:00 of each day to 09:00 of the next day is scheduled for the routine maintenance of AD systems.

Appendix

Request for MNP Fault Investigation / Modification**Part I** (to be filled-in by originator)

Date : _____
 To : _____

Serial No. : xx- nnnnnn
 Fax No / Email address¹² : _____

Please *investigate the problem/amend the record for the mobile number below :-

Mobile Number	RNO	DNO	Porting Serial No.	Gateway Number
Description				
Unable to receive incoming calls from your network. _____ _____ _____ _____				
* delete as appropriate				

Reporting by : _____ (with Co. Chop) Contact No. : _____
 Contact Person : _____ Fax No. / _____
 Date / Time of Transmission : _____ Email address : _____

Part II (to be filled-in by recipient)

Reply Slip :

The problem of the above mobile number has been investigated and result was found in dd/mm/yyyy at hhmm .

Result : _____

Reported by : _____ (with Co. Chop) Contact No. : _____
 Contact Person : _____ Fax No. / _____
 Date / Time : _____ Email address : _____

¹² Non-personal email address should be used where appropriate.

Part III (to be filled-in by Action Initiator)

Manual action should be taken to amend * AD / GN ?

No

Yes (please specify)

Status before action

Status after action

Reason (if any) :

* delete as appropriate

Action Request By :

(with Co. Chop)

Contact No. :

Contact Person :

Fax No. /

Date / Time of Transmission :

Email address :

Part (to be filled-in by Action Taker)

Reply Slip :

The required action in part III was completed on dd/mm/yy at hhmm.

Action Taken By :

(with Co. Chop)

Contact No. :

Contact Person :

Fax No. /

Date / Time :

Email address :

Annex F**Assignment of Two-Byte Network Identification Code**

This Annex lists out the assignments of two-byte network identification codes to each fixed network operator, mobile network operator and mobile virtual network operator for provision of mobile number portability service.

Table 4-1 Assignment of Two-Byte Network Identification Code to Sending / Receiving Network Operators

[✂]

Table 4-2 Assignment of Two-Byte Network Identification Code to Donor Network Operators (DNOs) / Recipient Network Operators (RNOs)

[✂]

*** End of Document ***