COMMUNICATIONS ALLIANCE LTD

INDUSTRY GUIDELINE

MOBILE NUMBER PORTABILITY-
NETWORK PLAN FOR
VOICE, DATA AND FAX SERVICES

G561:2009

G561:2009 Mobile Number Portability – Network Plan for Voice, Data and Fax Services

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1 INTRODUCTION

1.1 Number Portability for Mobile Numbers

Number portability for mobile numbers was implemented in Australia during 2001, in accordance with the *Telecommunications Numbering Plan 1997*, the Australian Competition and Consumer Commission's (ACCC's) October 1999 directions to the then Australian Communications Authority (ACA) and the implementation date of 25 September 2001 set by the ACMA.

With the advent of mobile number portability there was a change to the way calls are delivered to mobile terminating access networks. This document details the new networking arrangements.

This Network Plan is based on the ACMA's current practice of allocating blocks of mobile numbers to carriage service providers.

This plan defines the industry agreed call handling and technical interconnection arrangements based on a model of interconnected networks. The model of interconnected networks is derived from *Interconnection Model* (ACIF G538:1999).

1.2 Scope

This Network Plan was developed by the Communications Alliance Network Reference Panel Working Committee 11 on Mobile Number Portability Network Architecture and defines the industry agreed call handling arrangements to support mobile number portability. In particular, this plan describes call handling between interconnected networks for circuit switched voice, data and fax calls to portable mobile numbers.

This Network Plan is designed to be consistent with *Interconnection Implementation Plan* (ACIF G549:2002) and *A Framework for the Introduction of Mobile Number Portability in Australia* (ACIF G556:2000). It has been developed in conjunction with *Mobile Number Portability* Industry Code (C570:2009) and designed to meet the ACMA's MNP equivalent service criteria.

This Network Plan is subject to the rules and conditions outlined in ACIF G556:2000. In particular the use of donor based routing:

(a) is subject to agreement on commercial terms and conditions; and

(b) is limited to an initial start up period of one year from the implementation date set by the ACMA of 25 September 2001; and

(c) may be extended by bilateral agreement.

1.3 Related Communications Alliance Work

Porting processes are defined in *Mobile Number Portability* Industry Code (C570:2009) developed by the Mobile Number Portability Working Committee of the Communications Alliance Operations Codes Reference Panel.

1.4   2009 Revision

In 2009, the Mobile Number Portability Code was revised. At that time all associated Mobile Number Portability documents were republished as Communications Alliance documents to reflect the change of organisational name from ACIF. Where relevant any references to other documents have also been updated.

2 ACRONYMS

2.1 Acronyms

ACA

Australian Communications Authority

ACCC

Australian Competition and Consumer Commission

ACIF

Australian Communications Industry Forum

ACMA

Australian Communications and Media Authority

CAC

Carrier Access Code (this is equivalent to CSPIC - "Carriage Service Provider Identification Code" in the Telecommunications Numbering Plan)

CC

Country Code.

CTrSD

Contracted Transit Service Deliverer.

DCC

Directly Connected Customer.

DTrSD

Donor Transit Service Deliverer

IN

Intelligent Network

MNP

Mobile Number Portability

MSC

Mobile Switching Centre

OASD

Originating Access Service Deliverer

POI

Point of Interconnect

PMTS

Public Mobile Telephone Service (as defined in G549:2002)

PSD

Prime Service Deliverer

PSTS

Public Switched Telephone Service (as defined in G549:2002)

TASD

Terminating Access Service Deliverer

TrSD

Transit Service Deliverer

3 NETWORK MODEL

3.1 Overview

The **Interconnection Model** (ACIF G538:1999) identifies in general terms the various networks that may be involved in the establishment of a connection across multiple networks operating in Australia. The Interconnection Model identifies the roles of those networks in maintaining the ability of any customer to call any other customer, irrespective of who provides the access networks of the calling and called customers and any intervening networks.

The provision of public switched telephony and data services in a competitive environment will generically involve the calling customers, who may be directly connected to various originating access networks, fixed or mobile, and the called customer, a customer with a mobile number connected to a mobile terminating access network. The number of the called customer may be a number allocated to the terminating access service deliverer or it may be a number ported from another carrier or carriage service provider.

A call may be switched from an access network via other carrier or carriage service provider networks, e.g. a preselected fixed to mobile carrier, in which case it is that carrier or carriage service provider, acting as a Prime Service Deliverer who requires terminating access. For calls originated on a mobile network, the Access Service Deliverer will also be the Prime Service Deliverer who requires Terminating Access to complete calls to the customer with the ported number.

In developing this Network Plan it has been assumed that:

(a) the service deliverer assigned a particular responsibility under the Interconnection Model provides the network infrastructure to fulfil that responsibility. It is recognised that in practice the service deliverer and the carrier providing the network functions fulfilling the responsibilities of that service deliverer may be different entities; and

(b) interconnection payments are made between adjacent service deliverers on a call (the identification of non-adjacent parties would be more difficult to support because constraints in **Interconnection Implementation** Plan (ACIF G549:2002) may not allow all service deliverers in the call path to be identified); and

(c) customers must be able to move their number not only to a first recipient network, but to an unlimited number of subsequent networks.

3.2 Types of Service Deliverers

The following definitions are applicable to the types of Service Deliverers that may operate in a portable mobile number environment. Their relationships are shown in figure 1 below:
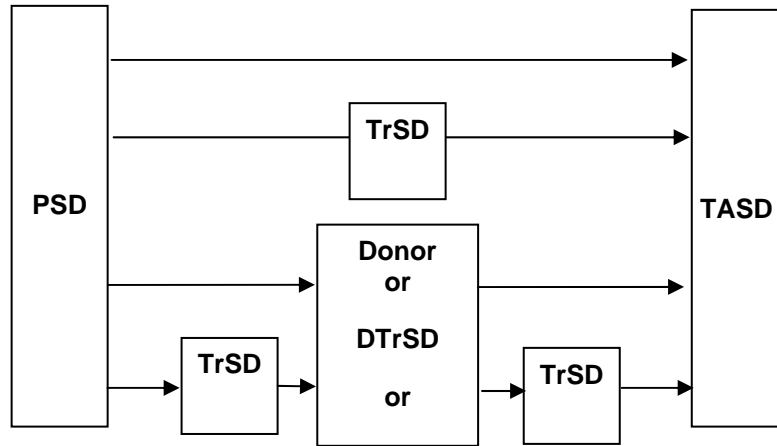
FIGURE 1
Service Deliverer Relationships

3.2.1 PSD – Prime Service Deliverer

"Where a carriage service or content service is provided to a Commissioning Customer through the provision of services by two or more Service Deliverers, the Prime Service Deliverer (PSD) for that service is defined to be the Service Deliverer who contracts to provide that particular service to the Commissioning Customer" **Interconnection Model** (ACIF G538:1999)– Section 2.1.8

"In the case of preselected services (including calls to mobile services), the Commissioning Customer is the customer corresponding to the A-party who chooses a Service Deliverer for outward preselected calls." ACIF G538:1999– Section 3.7.2

"The Commissioning Customer for a service is the customer or end-user that agrees to contract with a Service Deliverer for that service" ACIF G538:1999 – Section 2.1.7.

For the purposes of this plan, the first carrier in Australia receiving an inbound international call to an Australian mobile service number is deemed to be the PSD.

3.2.2 CTrSD – Contracted Transit Service Deliverer

The CTrSD is contracted by a PSD to determine the TASD for portable number ranges and route calls accordingly. The PSD and the CTrSD may agree that their arrangement will apply to a subset of all mobile number ranges. A PSD may use more than one CTrSD.

3.2.3 DTrSD – Donor Transit Service Deliverer

A DTrSD is contracted by the donor to determine the TASD for calls to contracted mobile number ranges of the donor and route calls accordingly. The donor and the DTrSD may agree that their arrangement will apply to a subset of all donor number ranges. A donor may use different DTrSDs for different parts of its allocated number ranges. The subdivision of number ranges between DTrSDs will be consistent with the block allocations of the ACMA.

3.2.4 Donor

For a particular mobile number range, the donor is the service deliverer allocated that number range by the ACMA.

3.2.5 TASD - Terminating Access Service Deliverer

The TASD is the current access provider for the called party.

3.2.6 TrSD - Transit Service Deliverer

"A Transit Service Deliverer (TrSD) is any Service Deliverer that provides a Transit Service between Service Deliverers" ACIF G538:1999 Section - 2.2.5.
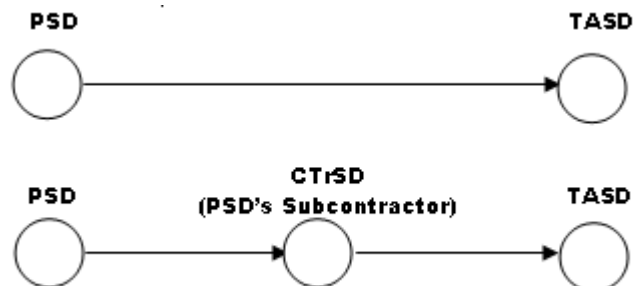
4 CALL HANDLING

4.1 Overview

Under the hybrid model which has been selected for call routing under MNP the PSD can either:

(a) route the call to the donor or its subcontractor (the DTrSD) which will route the call to the correct TASD. (See Section 1.2 for conditions of donor routing.)
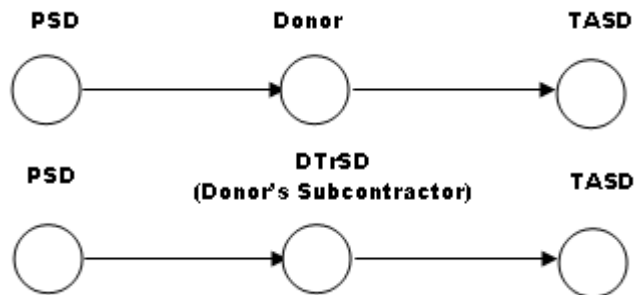
(b) route the call directly to the TASD or via the PSD's subcontractor (the CTrSD).

In this way the actual TASD for any call is determined. In addition there are trunking rules and call service indicators which ensure that calls are not mis-directed.

4.2 Detailed Routing Responsibilities

4.2.1 PSD

The PSD must ensure delivery of the call. This may be achieved by routing the call to the donor or the DTrSD.

Alternatively the PSD may determine the correct TASD itself or route the call to its CTrSD.

4.2.2 TrSD

A TrSD may be used on any section of a call between the PSD and the TASD.

4.2.3   Donor

When the donor receives a call to a number in the donor's allocated number range from a PSD which has not determined if the number is ported, it will determine the correct TASD for the call and route the call accordingly.

4.2.4   DTrSD

When the DTrSD receives a call from a PSD to a number in the number range contracted with the donor it will determine the TASD and route the call accordingly.

4.2.5   CTrSD

When the CTrSD receives a call from a PSD the CTrSD will determine the TASD and route the call accordingly.

4.2.6   TASD

Calls to ported numbers on the TASD's network that are identified as such at the point of interconnection must be terminated by the TASD and not passed to another network by the TASD. This does not preclude call forwarding.

5 INTERCONNECTION FOR PORTABLE MOBILE NUMBERS

This section provides a description of the industry multi-carrier network interconnection prefix structure and its application in mobile number portability. Interworking between networks is defined below. Refer to **_Interconnection Implementation Plan_** (ACIF G549:2002) for a detailed explanation of the application of this prefix structure and a full list of service digits.

5.1 Interconnection Prefix Structure

The Interconnection Implementation Plan is based around the use of additional prefix digits to identify interconnection call types. These prefix digits appear as additional digits in the Called Party Number parameter carried as part of the I-ISUP IAM message. The purpose of the Interconnection Implementation Plan is to facilitate efficient call routing to the identified service provider and to provide service information to the service provider for the call from the preceding network. A network sending a call across a Point of Interconnection must ensure the correct prefix is inserted.

For the interconnection prefix "14", a variable length prefix structure has been defined. The 14XY is the first part of the prefix structure, followed by one or more "Service Digits" and then the remaining Called Party address digits which typically relate to the dialled number. That is:

14XY S xxxxxxxxxxx, where:

14XY   Carrier Access Code (CAC) – 14XY codes correspond to carrier access codes assigned by the ACMA, and form the first part of the interconnection prefix. Typically the 14XY code will correspond to the network to which the call is destined.

S   Service Digits – provides explicit customer or network information for billing purposes and to enhance network integrity. Variable number format (see below).

xxxx   Called Party address digits typically contain those digits dialled by the user.

TABLE 1
MNP Interconnection Prefix Structure

| Service Digit/s	POI Digit Length	Description / Examples
44		PSTS (mobile & fixed) customer dials a mobile service. The PSD provides call handover to the carrier holding the allocation of number block that contains the dialled number. PSD has not determined the carrier it is passing the call to is the TASD.
	16	POI Digits 14XY+44+0+PMTS [Note 1]
42		PSTS (mobile & fixed) customer dials a mobile service. The PSD provides call handover to the TASD. PSD has determined the carrier it is passing the call to is the TASD and the number does not reside with the nominal mobile carrier for that number block.
	16	POI Digits 14XY+42+0+PMTS [Note 1]
2		PSTS (mobile & fixed) customer dials a mobile service. The PSD provides call handover to the TASD. PSD has determined the carrier it is passing the call to is the TASD and the number resides with the nominal mobile carrier for that number block. [Note 2]
	15	POI Digits 14XY+2+0+PMTS [Note 1]

NOTE: In this table the reference to PMTS means the number associated with the Public Mobile Telephone Service. However the leading zero does not form part of the PMTS number.

NOTE: From 1st January 2003, the TASD must accept service digits 42, as an alternative to 2 for calls to PMTS numbers which have transferred between technologies within their network.
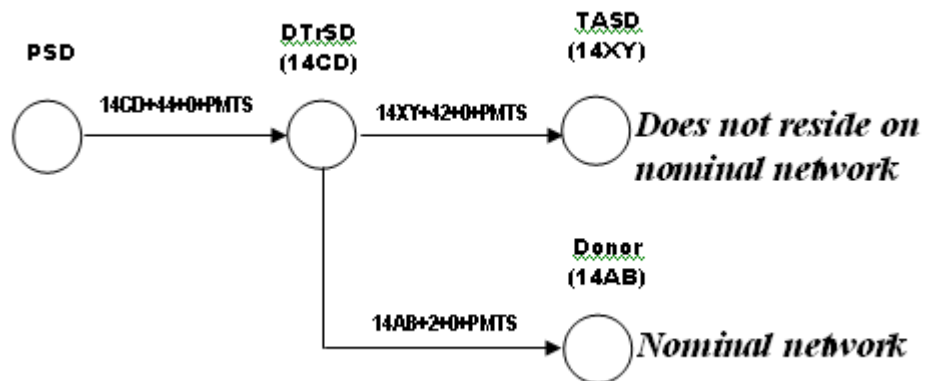
5.2 Application of the Interconnection Prefix Structure

A number of call scenarios can be easily supported by the interconnection prefix structure described in Section 5.1. Several of the most common call cases are illustrated below.
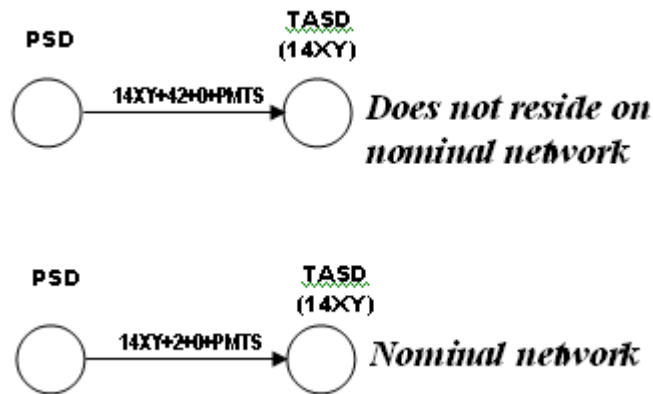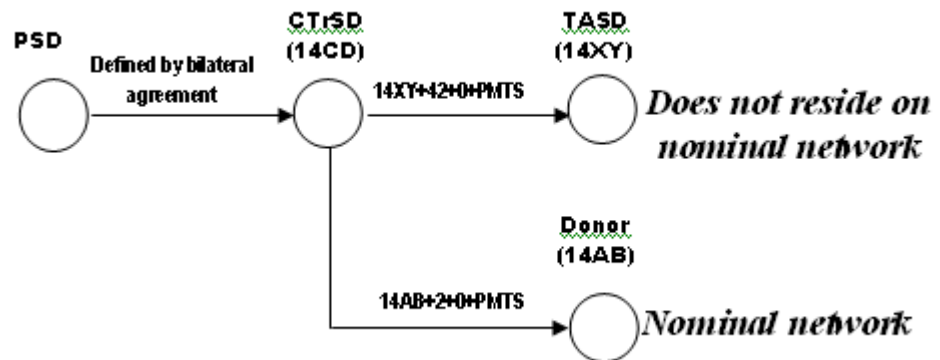
5.2.1 Nominal Network Routing
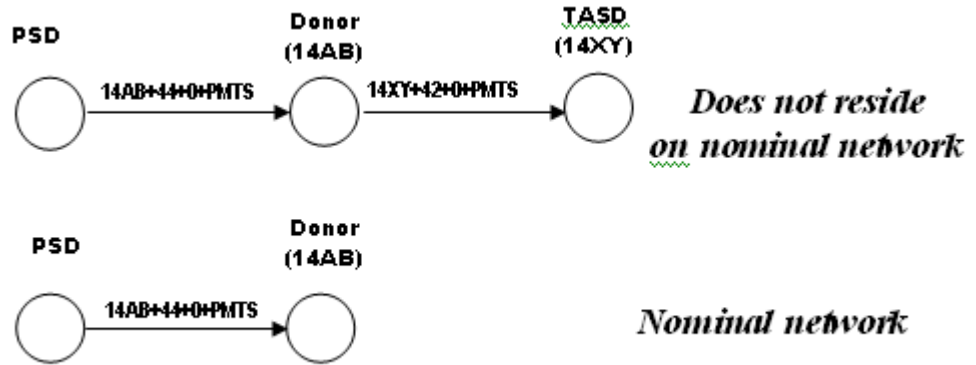
FIGURE 2
Routing via Donor

FIGURE 3
Routing via DTrSD

FIGURE 4
Direct Routing

FIGURE 5
Routing via CTrSD

5.3 Error Cases

Three error cases have been identified:

(a)   Error Case 1: Incorrect TASD specified for a call to a ported number;

(b)   Error Case 2: Incorrect TASD specified for a call to a non-ported number; and

(c)   Error Case 3: Donor/DTrSD is not valid for number specified.

Currently there is a range of treatments adopted by industry for the handling of error cases. Therefore it is recommended that:

(a) for Error Cases 1 & 2, similar treatment for calls to unallocated numbers should be applied; and

(b) for Error Case 3, similar treatment for calls with invalid interconnection prefixes should be applied.

6 REFERENCES

Publication	Title
Industry Codes	
C570:2009	Mobile Number Portability

Industry Guidelines	
ACIF G538:1999	Interconnection Model
ACIF G549:2002	Interconnection Implementation Plan

Industry Documents	
Telecommunications Numbering Plan 1997	

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Communications Alliance was formed in 2006 to provide a unified voice for the Australian communications industry and to lead it into the next generation of converging networks, technologies and services.

In pursuing its goals, Communications Alliance offers a forum for the industry to make coherent and constructive contributions to policy development and debate.

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