



ICT Decision 2011-4

Grand Cayman, 23 December 2011

Determination of a dispute on which SMP protocol should be used in the Cayman Islands to enable the exchange of SMS messages between Digicel and LIME

Overview

In this Decision, the Authority determines that the SMPP protocol should be used in the Cayman Islands to enable the exchange of SMS messages between Digicel and LIME unless otherwise agreed by the parties at some future date.

BACKGROUND

1. In ICT Decision 2005-1 ("Decision 2005-1"), *Interim Decision and Further Process for Local Number Portability*, 29 March 2005, the Information and Communications Technology Authority ("the Authority") determined that there were significant benefits to Local Number Portability ("LNP") and that it would be appropriate to consider further the cost of implementing LNP in the Cayman Islands. Accordingly, the Authority established an LNP Consortium ("the Consortium"), consisting of major ICT Network Licensees with Authority Staff providing administrative support, to identify the most appropriate LNP model for the Cayman Islands and to investigate its costs.
2. In ICT Decision 2008-5 ("Decision 2008-5"), *Decision and Further Process on Local Number Portability*, 18 December 2008, the Authority determined, based on the evidence filed, that the benefits likely to arise from the requirement to provide LNP outweigh the likely cost of implementing. The Authority was also satisfied on reasonable grounds that such a requirement would not impose an unfair burden on any Licensee. Therefore, in accordance with section 71(3) of the Information and Communications Technology Authority Law 2006 ("ICTA Law", currently the 2011 revision), the Authority directed all operators licensed to provide telephony services (Type 1, 3, 4 and 5 Services) to implement LNP.
3. LNP is a process whereby customers can keep their fixed or mobile number when changing from their previous fixed or mobile provider (known as the "Donor Operator") to their new fixed or mobile provider (known as the "Recipient Operator").
4. The underlying process to allow for this number change, which is transparent to a customer, is far more complex. In the Cayman Islands, fixed line, fixed wireless and mobile Licensees are allocated number ranges by the Authority. The Licensees

then allocate numbers to individual customers. The information in the number is typically used for two purposes: customer identification and call routing. The customer identification function allows billing and administration to be carried out by the customer's service provider. The call routing function permits the call, or in this case a 'texted' Short Message Service ("SMS") message, to be directed to the switch of the called party's service provider (host switch) which in turn connects the call or sends the SMS to the called party's telephone.

5. If the called/texted number has been 'ported' then, although it continues to identify the customer being called/texted, it no longer correctly identifies the network and exchange where the customer is located. In order to effect LNP, additional information is required to ensure that the call is routed correctly. This additional information should identify that the customer's number is no longer the same as the network routing number. Therefore, some form of "number translation" needs to take place to identify the network of the new service provider chosen by the customer and to which the call/SMS should be directed. In this way, a call/SMS to a ported number gets completed to the customer. It is this general process which is referred to as LNP.
6. On 6 September 2011, the Consortium members (being Cable & Wireless (Cayman Islands) Ltd. (trading as "LIME"), Digicel Cayman Ltd. ("Digicel"), TeleCayman Ltd. and WestTel Ltd.) signed an agreement with Porting Access BV for it to implement a number portability administration system and central number database for the Cayman Islands ("the Porting Contract"). On the 30 August 2011, the Consortium members agreed that the "Go Live" date for LNP would be the 31 January 2012; meaning it would be from this date that customers, in the case of mobile services, could keep their telephone numbers when they move their mobile services from one mobile provider to another mobile provider.
7. A dispute has arisen between the mobile operator members of the Consortium, Digicel and LIME (collectively, "the Parties"), as to the appropriate method of ensuring the network connectivity needed so that SMS messages can be effectively routed to a ported number ("the Dispute"). The Dispute has arisen because each mobile operator is proposing to use a different protocol to allow for this. Digicel wants to use the Signalling System 7 ("SS7") protocol, and LIME wants to use the Short Message Peer-to-Peer ("SMPP") protocol, to route their SMS messages. The SS7 protocol is used in the public switched telephone system for setting up calls and providing services whereas the SMPP is a data communications interface established over the Internet for the transfer of short message data between Short Message Service Centres ("SMSC").¹
8. The Authority wrote to both parties on 6 December 2011 explaining that, in the context of implementing LNP, in the Managing Director's opinion the Parties are unlikely to reach agreement on which SMS protocol should be used by them both to handle inter-operator SMS texting. Further, this impasse will likely delay, perhaps significantly, the 31 January 2012 LNP implementation date agreed by the Consortium members on the 30 August 2011. Failing to meet the implementation date will deny customers the benefits of LNP, thus not being in the public interest.

¹ For further information about both, please see for example - http://sms.24cro.com/op_1_5_en.htm.

9. Therefore, in pursuance of the Managing Director's powers under section 9 (3) (j) of the ICTA Law, the Dispute was referred to the Authority by the Managing Director for determination; one of the Authority's principle functions being to resolve disputes concerning interconnection (section 9 (3) (g) of the ICTA Law). In 6 December 2011 letter, the Authority explained that given the "Go Live" date is at the end of the next month, and that the matter needs to be resolved before then, an expedited process is appropriate. The Parties were directed to provide their views to the Authority, no later than 5 p.m. on 13 December 2011, as to which SMS protocol should be used in the Cayman Islands between the Parties. The Parties had until 12 p.m. on 19 December 2011 to file a written reply to any comments made by the other.
10. On 7 December 2011, Digicel wrote to the Authority requesting an extension to the above submission dates, which was granted by the Authority via e-mail on 8 December 2011. The Authority revised the process timetable and directed that submissions from the Parties be filed with the Authority by 10 a.m. on 19 December 2011, and any replies to those submissions to be filed with the Authority by 12 p.m. on 21 December 2011.
11. The Authority received comments from both parties on 19 December 2011. A reply comment was received from Digicel on 21 December 2011.

SUBMISSIONS

DIGICEL

12. In summary, Digicel submitted that the SS7 protocol should be used in the Cayman Islands to enable the exchange of SMS messages between the Parties, for the reasons set out below.
13. Digicel stated that Decision 2008-5 did not address post LNP SMSC interworking and therefore did not specifically state a standard for SMSC interconnection. It explained that it upgraded its core switching network "as per the established GSMA standard."
14. Digicel also stated that, as far as it understands, LIME's network is based on the same network provider's (Ericsson's) GSM architecture as Digicel's and that "it would be reasonable to assume that [LIME's] network would have the same functionality to accommodate SMSC interworking using SS7."
15. Digicel then referred to 3GPP² document *TS 23.066 version 10.0.0 Release 10*,³ which states at section 3 (definition section) that:

"Non-call related signalling message: all signalling messages where the MSISDN is used to route the message on SCCP level except MAP SRI without OR parameter set (ie SMS_SRI, SRI for SOR, Send_IMSI, CCBS_Requests etc)."

² An organisation providing certain recommended mobile telephony standards for its members.

³ Digital cellular telecommunications system (Phase 2+), Universal Mobile Telecommunication System (UMTS), Support of Mobile Number Portability (MNP), Technical Realization, Stage 2 - http://www.etsi.org/deliver/etsi_ts/123000_123099/123066/10.00.00_60/ts_123066v100000p.pdf - reference is from Section 3 Definitions and abbreviations and is in the definition at Section 3.1.

16. Digicel submitted that this makes it clear to a technician that "SS7 signalling is required for" mobile number portability ("MNP") on the basis that "in all cases for non-call related signals SMS_SRI signalling is required"; noting that the reference to "except MAP SRI without OR parameter set" is a reference to call signalling. This in turn makes it clear that non-call related signalling message refers to "[...] all signalling messages where the MSISDN is used to route the message on SCCP level..... ie SMS_SRI. SMS_SRI is reliant on SS7 signalling."
17. In addition, Digicel stated that it spoke with Stephen Hayes from Ericsson, who was the Chairman of the 3GPP meeting SP-51 at which the current release of the document referred to above, 23.066, was frozen, and he had indicated that SS7 signalling was "chosen because the existing telecommunications infrastructure followed Mobile Application Part (MAP) protocol which is the protocol used to support GSM switching requirements in the switching elements of GSM networks."
18. Further, Digicel stated that it had asked him whether, therefore, "that meant it was simpler to implement SS7 signalling to enable MNP" and he had agreed with that statement.

LIME

19. In summary, LIME submitted that the SMPP protocol should be used in the Cayman Islands to enable the exchange of SMS messages between the Parties, for the reasons set out below.
20. LIME submitted that there are two ways in which mobile operators can exchange SMS messages: either via the SS7 signaling network or via an SMPP connection.
21. LIME explained that under the 3GPP standard, SMSs are exchanged via the same links as SS7 signaling messages. An advantage of such a solution is that it uses the existing SS7 infrastructure. However, the signaling network would have to be scaled up to accommodate the additional traffic, and the specific number of links that would be required depends on the volume of traffic between the two networks. Under this methodology, messages are sent directly from the originating SMSC directly to the mobile switch serving the terminating handset. This means any value-added services offered through the terminating network's SMSC cannot be provided.
22. In comparison, an SMPP connection is essentially a Virtual Private Network ("VPN") between two SMSCs established over the Internet. Apart from representing an efficient and cost-effective method of transmitting data, SMPP also facilitates applications that wish to communicate with their customers via SMS. An example is the provision of information upon receipt of a text message.
23. LIME further explained that most mobile operators who exchange text messages between domestic networks do so via an SMPP connection. This is because the VPN that is used to do this is inexpensive, flexible and scalable.
24. It then explained that, in terms of countries that have implemented an *All Call Query* number portability solution (which is implemented in the Cayman Islands), it understands that operators in Panama, Ghana and Kenya, for example, use SMPP connections to exchange SMSs. Also, LIME identified that LIME and Digicel have

successfully connected their two regional SMS networks via an SMPP connection in Jamaica since 1 June 2005 without issues.

25. LIME then explained that when the Authority issued its Decision 2008-5 in December 2008 to implement fixed and mobile number portability, the Consortium (including Digicel) conducted its "initial work" during the course of 2009. Following that work, LIME engaged vendors, reviewed options and proposals, and designed its LNP solution in the spring of 2010 and it was at that time that it selected a solution involving an upgrade to its Signal Transfer Points ("STPs") and to its SMSC to accommodate LNP routing tables. In the case of the SMSC, this consisted of upgrading the software, and introducing a routing table that would map MSISDNs (i.e. mobile telephone numbers) to networks if the telephone number had been ported out of the Donor Network.
26. For LIME, significant considerations underlie its decision to adopt this solution, including the:
 - i) need to launch fixed and mobile number portability at the same time;
 - ii) cost (the alternative solution would have cost several million more); and,
 - iii) ease of integration and implementation.
27. Also, a material factor for LIME was that the selected solution was compatible with, and did not require a change to, the existing connection between LIME's and Digicel's SMSCs.
28. LIME claimed that through Digicel's involvement in the Consortium, Digicel was aware that LIME had done considerable work towards implementing fixed and mobile number portability since early 2010. However, it was only in October 2011 that Digicel first enquired about SMS interworking via an SS7 connection.
29. In support of this, LIME referred to a communication it received from Digicel on the 18 October 2011 which stated:

"As discussed we would like to migrate our existing SMS interworking via SMPP to SS7. Can you please confirm how/when this can be accommodated? We would like to move forward with this as soon as possible."
30. On 31 October 2011, LIME asked Digicel "the reason for the shift just now", noting that this had never been raised during a quarterly service review between the two companies before now. Digicel responded to this on the 1 November 2011 stating that SS7 "is a prerequisite for LNP" and asked whether LIME had any feedback.
31. In LIME's view, this is the full explanation to date given by Digicel to LIME for the requested change, and LIME disputes the assertion that SS7 "is a prerequisite for LNP". In support, LIME referred to the fact that it is implementing number portability using SMPP.

32. As further support, LIME also referred to Digicel's sister company, Digicel (Panama) S.A., which it states successfully implemented number portability in Panama on 29 November 2011, using an SMPP connection with the SMSCs of the other mobile operators in that country, including Cable & Wireless Panama S.A. and explained that the Regulator there, the *Autoridad Nacional de los Servicios Públicos*, examined the question of whether to change the SMS interconnection methodology from SMPP to SS7 back in 2010. Noting that a number of companies, including Digicel (Panama), S.A., supported the proposal to use SMPP, and noting that this was the technology currently in use, LIME stated that the Regulator ordered on 15 October 2010 that the operators maintain the use of SMPP for the exchange of text messages following implementation of number portability.
33. LIME also submitted that a significant problem with an SS7 connection is that text messages from third-party networks (like Digicel's) would no longer be filtered through the LIME SMSC. Rather, they would be conveyed directly from the third-party SMSC to the LIME STP, and from there directly to the LIME mobile switching centre ('MSC') and the customer's handset.
34. In LIME's view:
 - a) there would be no means to filter spam text messages, without significant investment in a new firewall and with no spam filtering, LIME's access network could face a significant unplanned increase in traffic which would consume network resources and make it more difficult for customers to use the network for legitimate voice and SMS calls.
 - b) Second, it is not clear whether LIME would be able to charge Digicel for termination of text messages originating on Digicel's SMSC (and vice versa), as traffic is measured through the SMSC.
 - c) Third, LIME and its sister companies offer to third-party content and other service providers an SMSC-based platform for the provision of value-added services to consumers. For example, a number of banks offer SMS-based banking services. These are provided through features in the SMSC. However, if LIME were to switch to an SS7-based connection with Digicel, the banks' customers' text messages would bypass the SMSC and the banks would no longer be able to provide these services to their customers on the Digicel network.
35. Finally, LIME submitted that the Parties currently exchange text messages over an efficient SMPP link and switching to an SS7-based connection would mean both LIME and Digicel would have to double their existing signaling links and associated circuits in order to accommodate the additional (and unplanned) traffic load. This would increase considerably each provider's network costs.

DIGICEL'S REPLY

36. Digicel stated that it has devoted significant time to and incurred substantial costs in upgrading its systems for LNP, with the work required to ready Digicel's network being completed by Ericsson. Ericsson precisely followed the defined 3GPP standards and at no point was it suggested that the 3GPP standard was the wrong way forward.

37. In Digicel's view, LIME's reference to the routing solution implemented for MNP in Panama, while interesting to note, is no determinant of what routing solution has to be used in the Cayman Islands.
38. Further, in Digicel's view, it has implemented the 3GPP standard for MNP SMS routing and it had expected LIME to do likewise as in its view "the industry standard should be followed except in the absence of a reason to deviate from it. No such reason has been provided by LIME other than it being helpful to LIME's business alone."
39. Also, according to Digicel, LIME suggested that Digicel should have sent to LIME technical information or proposals if Digicel had wanted to use SS7. Digicel claimed that it is not clear what it is supposed to have sent to LIME given that LIME's network already supports SS7 signaling.
40. Digicel submitted that while it did state that a switch to SS7 "is a pre-requisite for LNP", this was not a suggestion that MNP could be implemented by an other means under any circumstances and explained that its statement reflected "the fact that it takes significantly more expense to implement a more complex SMPP approach, rather than a standardized SS7 approach, to SMS MNP routing. Clearly no rational investor will incur expenditure unnecessarily."
41. In support, Digicel stated that its default position was therefore to stick with the standardized approach that was the simplest and most cost effective to implement. Digicel also stated that, in order to accommodate an SMPP solution for MNP, it will have to undertake bespoke modifications.
42. Digicel questioned LIME's assertion that there could be problems with SPAM if SMPP is not used. It is not clear to Digicel why this should be a particular problem given that Digicel operates SS7 SMS signaling elsewhere and has no such issues. Digicel also questions LIME's assertion that SMS could not be charged for if SS7 is used given that a billing record should be generated by each SMS as it enters the LIME network.
43. Further, while LIME's statement that it has an SMSC platform for value-added services and that these will not work with a SS7 solution may be the case, this is the first time that LIME has raised the issue with Digicel. Digicel states that "[it] imagine[s] that any such services are probably offered to a very small number of account holders and that a workaround solution could be found for the small number of people involved if necessary (at least in the interim)."
44. Digicel submitted that should any party be required to make amendments to its network to overcome SMS routing issues in this instance "under the circumstances, and exceptionally" those costs should be shared amongst the consortium members affected.
45. Finally, Digicel stated that it would now be extremely challenging, if not entirely impractical, to meet the "Go Live" deadline of 31 January 2012 and asked the Authority to extend the target date for at least MNP if not fixed number portability as well.

AUTHORITY ANALYSIS AND DECISION

46. As noted in Decisions 2005-1 and 2008-5, the Authority considers that the Consortium members should take responsibility for choosing the most appropriate LNP solution for the Cayman Islands. Which SMS protocol should be used by the Parties in order to allow for the exchange of SMS messages in an LNP environment would normally be a network issue for those operators to agree upon.
47. However, and as set out to the Parties by the Authority in its letter to them dated 6 December 2011, the Authority considers that the Dispute will likely delay, perhaps significantly, the 31 January 2012 LNP implementation date agreed to by all Consortium members on 30 August 2011. In the Authority's opinion, failing to meet this implementation date will deny customers the benefits of LNP, and this is not in the public interest. As such, the Authority considers it appropriate in this case to make a determination on the Dispute.
48. In making its determination, the Authority is guided by Regulation 11 of the Authority's Dispute Resolution Regulations 2003 which states that:
- 11. In determining a dispute, the Authority shall act expeditiously, and in doing so may have regard to-*
- (a) the subject matter of the dispute;*
(b) the need to inquire into and investigate the dispute;
(c) the objectives and functions of the Authority; and
(d) all matters affecting the merits, and fair settlement of the dispute.
49. For the following reasons, the Authority considers that in these circumstances, and given the facts before it, the appropriate SMS protocol to be used in the Cayman Islands by the Parties to exchange SMS messages is SMPP.
50. The Authority disagrees with Digicel's statement that "SS7 signaling is required for mobile number portability" or, as Digicel put in its 18 October 2011 communication with LIME, that "[SS7] is a prerequisite for LNP." Indeed, contrary to the above assertions, and as accepted by Digicel in its Reply, it is clear from the evidence provided to the Authority that SMPP can be and is being used for LNP. As evidenced by LIME in its submission, it will be using SMPP for mobile number portability, and SMPP is being used by the Parties' sister companies in Panama for routing SMS messages to ported numbers.
51. Further, the Authority notes a 2010 GSM Association ("GSMA") publication in relation to SMS hubbing,^{4 5} GSMA being an association of mobile operators and associated companies set up for among other things the standardisation of the GSM system. In section 5 of that publication, under the title *Access and Connection*

⁴ As explained in that document a Hub Service is a turn key system which allows operators to send and receive SMS messages to multiple destinations globally, rapidly establishing Interworking relationships by using only one connection and one contact.

⁵ In *IN.08 SMS Hubbing Handbook, Version 4.2*, dated 25 November 2010 - http://www.gsm.org/documents/IN08v4_2.pdf

Method, the GSMA states that "the Parties shall mutually determine and agree upon the appropriate method of interconnection, i.e. SS7 or IP [i.e. SMPP]" and then goes on to explain what needs to be done depending on which SMS protocol the parties agree to use. Again, this is supporting evidence that either protocol can be used for SMS connectivity.

52. Therefore, the Authority considers that either the SS7 or SMPP protocol could be used in the Cayman Islands to enable the exchange of SMS messages between the Parties. Therefore, the Authority does not consider it necessary in resolving this Dispute for it to consider the relative technical merits of each protocol as either could be satisfactorily used for LNP.
53. As mentioned above, it would normally be for the Parties to agree between themselves which SMS protocol they will use to provide the necessary LNP network functionality for the exchange of SMS messages. However, the Dispute is before the Authority to determine. The Authority considers relevant what the reasonable expectations of the Parties were during the setting up of the LNP solution for the Cayman Islands.
54. As evidenced by the e-mail dated 18 October 2011 from Digicel to LIME, it was over a month after the "Go Live" LNP implementation date was agreed by all Consortium members (on 30 August 2011), and only three-and-a-half months prior to the actual "Go Live" date, that Digicel first approached LIME to change the protocol used for their SMS interconnection. The Authority notes LIME's 31 October 2011 reply to Digicel's 18 October 2011 request, where LIME asked Digicel what was "the reason for the shift just now", noting that this had never been raised during LIME's and Digicel's quarterly service reviews prior to that date.
55. Also, as mentioned by LIME in its submission, the Parties currently exchange text messages over an SMPP link, and were therefore using the SMPP link when the Authority made its Decision 2008-5, during the design work for the Parties' LNP porting solutions and when they both agreed the "Go Live" date. Based on the evidence before the Authority, the Authority considers that prior to the 18 October 2011 communication, it would have been reasonable for LIME to assume that SMPP would be the applicable SMS inter-operator protocol.
56. Further, the Authority considers that it was reasonable for LIME to have expected Digicel, if Digicel had selected a protocol other than their currently used protocol, to have raised this issue with LIME much earlier in the LNP implementation process than it did. For example, during the initial Consortium implementation work conducted during the course of 2009 that LIME mentions in its submission; but not three-and-a-half months before the agreed 31 January 2012 implementation date.
57. Given the above, the Authority considers that it is appropriate, in determining the Dispute, for the Parties to use the SMPP protocol to enable the exchange of SMS messages unless otherwise agreed by them at some future date.
58. Therefore, the Authority directs that Digicel make the necessary networking modifications to use the SMPP protocol to enable the exchange of SMS messages between the Parties and to bear the costs for these modifications consistent with the Authority's determination in Decision 2005-1 that each Licensee is responsible for its own internal costs.

59. Finally, in relation to Digicel's request to extend the 31 January 2012 "Go Live" date, no extension to that date is granted.