

LRN cites from FCC LNP Orders

**FCC 96-286
FEDERAL COMMUNICATIONS COMMISSION**

In the Matter of)
Telephone Number Portability) *CC Docket No. 95-116*
) *RM 8535*

**FIRST REPORT AND ORDER AND
FURTHER NOTICE OF PROPOSED RULEMAKING**

Adopted: June 27, 1996 *Released: July 2, 1996*

Para 13

Location Routing Number (LRN)....

Essentially, LRN assigns a unique 10-digit telephone number to each switch in a defined geographic area. The location routing number serves as a network address. Carriers routing telephone calls to customers that have transferred their telephone numbers from one carrier to another perform a database query to obtain the location routing number that corresponds to the dialed telephone number. The database query is performed for all calls to switches from which at least one number has been ported.¹ The carrier then would route the call to the new carrier based on the location routing number

APPENDIX E - DESCRIPTION OF NUMBER PORTABILITY METHODS

1. Database methods

1. Location Routing Number (LRN). Under AT&T's LRN proposal, a carrier seeking to route a call to a ported number queries or "dips" an external routing database, obtains a ten-digit location routing number for the ported number, and uses that location routing number to route the call to the end office switch which serves the called party.² The carrier dipping the database may be the originating carrier, the terminating carrier, or the N-1 carrier (the carrier prior to the terminating carrier). Under the LRN method, a unique location routing number is assigned to each switch. For example, a local service provider receiving a 7-digit local call, such as 887-1234, would examine the dialed number to determine if the NPA-NXX is a portable code.³ If so, the 7 digit dialed number would be prefixed with the NPA and a 10-digit query (e.g., 679-887-1234) would be launched to the routing database. The routing database then would return the LRN (e.g., 679-267-0000) associated with the dialed number which the local service provider uses to route the call to the appropriate switch. The local service provider then would formulate an SS7 call set up message with a generic address parameter, along with

¹ We use the term "ported" in this context to mean the transfer of a telephone number from one carrier's switch to another carrier's switch, which enables a customer to retain his or her number when transferring from one carrier to another.

² See Notice, 10 FCC Rcd at 12364. See also AT&T Comments at 18-23; AT&T February 6, 1996 Ex Parte Filing at 6-9.

³ An NXX code, or central office code, is the second three digits of a ten digit telephone number and identifies the service provider switch that serves a specific customer location. See Notice, 10 FCC Rcd at 12354.

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*the forward call indicator set to indicate that the query has been performed, and route the call to the local service provider's tandem for forwarding.*⁴

2. *LRN is a "single-number solution" because only one number (i.e., the number dialed by the calling party) is used to identify the customer in the serving switch.*⁵ *Each switch has one network address -- the location routing number. The record and the Industry Numbering Committee (INC) indicate that LRN supports custom local area signalling services (CLASS), emergency services, and operator and directory services, but may result in some additional post-dial delay.*⁶ *LRN can support location and service as well as service provider portability.*⁷ *Finally, LRN supports wireless-wireline and wireless-wireless service provider portability.*⁸

⁴ This description of call flow employing the LRN method was adapted from the Proposed Final Draft on number portability produced by the Industry Numbering Committee. See INC Report at 49-51.

⁵ AT&T Comments at 20; CA LNP Task Force Report at 5; INC Report at 45.

⁶ INC Report at 45.

⁷ Id. at 46.

⁸ Id. at 45-58; CA LNP Task Force Report at 5-9.

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**FCC 97-289
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
Telephone Number Portability) CC Docket No. 95-116
) RM 8535

SECOND REPORT AND ORDER

Adopted: August 14, 1997

Released: August 18, 1997

8. Although the Commission did not mandate a specific local number portability method, the NANC, the industry and the state/regional workshops have chosen the Location Routing Number solution (LRN) as the preferred method of providing long-term number portability.⁹ Under the LRN method, a unique 10-digit number, or "location routing number" is assigned to each central office switch to identify each switch in the network for call routing purposes. The location routing number then serves as a network address. A database is used to store the routing information for end users who have ported their telephone numbers to another LEC.¹⁰ The database contains the directory numbers of all ported subscribers and the location routing numbers of the switches that serve them. Carriers routing telephone calls to customers who have ported their telephone numbers from one carrier to another query the local Service Management System (SMS)¹¹ database to obtain the location routing number that corresponds to the dialed telephone number. This database query is performed for all calls to switches from which at least one number has been ported. Based on the location routing number, the querying carrier then would route the call to the carrier serving the ported number.¹²

⁹ See *First Order on Reconsideration at ¶¶ 8-10; See also Working Group Report at Appendix D -- "Architecture & Administrative Plan for Local Number Portability" at § 7.2 (Architecture Task Force Report)*.

¹⁰ We use the term "port" in this context to mean the transfer of a telephone number from one carrier's switch to another carrier's switch, which enables a customer to retain his or her number when transferring from one local service provider to another.

¹¹ A Service Management System is a database or computer system not part of the public switched network that, among other things: (1) interconnects to a service control point (SCP) and sends to that SCP the information and call processing instructions needed for a network switch to process and complete a telephone call; and (2) provides telecommunications carriers with the capability of entering and storing data regarding the processing and completing of a telephone call. *First Report & Order*, 11 FCC Rcd at 8402, ¶ 95 n.288. An SCP is a database in the public switched network that contains information and call processing instructions needed to process and complete a telephone call. The network switches access an SCP to obtain such information. Typically, the information contained in an SCP is obtained from the SMS. *Id.*

Local Service Management Systems are the databases that carriers will regularly access to determine if a telephone number has been ported. The Number Portability Administration Center Service Management Systems (NPAC SMSs) are the regional databases maintained by the local number portability administrators, which contain the lists of ported telephone numbers. These lists of ported numbers are periodically transmitted from the NPAC SMS to the local Service Management Systems for querying by the service providers.

¹² *First Report & Order*, 11 FCC Rcd at 8494, Appendix E-1.

**North American
Numbering Council**

**Local Number Portability
Administration
Selection Working Group**

April 25, 1997

Appendix D

Architecture & Administrative
Plan for Local Number Portability

NANC - LNP Architecture Task Force

ISSUE - 1, REVISION 3"
APRIL 23, 1997

nanca1r3.doc

LRN cites from FCC LNP Orders

7 LNP ASSUMPTIONS (Wireline Only)

7.1 Service Provider Definition

In the context of LNP, a Service Provider is a facility (switched) based¹³ local telecommunications provider certified by the appropriate regulatory body or bodies.

7.2 LRN -- Location Routing Number

LRNs are 10 digit numbers that are assigned to the network switching elements (Central Office - Host and Remotes as required) for routing of calls in the network. The first six digits of the LRN will be one of the assigned NPA NXX of the switching element.

The purpose and functionality of the last four digits of the LRN have not yet been defined, but are passed across the network to the terminating switch.

7.3 LNP Portability Boundary

If location portability is ordered by a state commission in the context of Phase I implementation of LRN, location portability is technically limited to rate center/rate district boundaries of the incumbent LEC due to rating/routing concerns. Additional boundary limitations, such as the wire center boundaries of the incumbent LEC may be required due to E911 or NPA serving restrictions and/or regulatory decisions.

¹³*The term facility based is used in this document to describe carriers who own or lease switching equipment.*

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) RM-8535

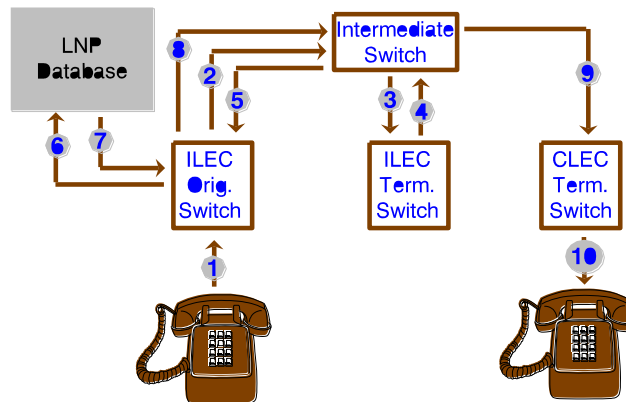
**FIRST MEMORANDUM OPINION AND
ORDER ON RECONSIDERATION**

Adopted: March 6, 1997

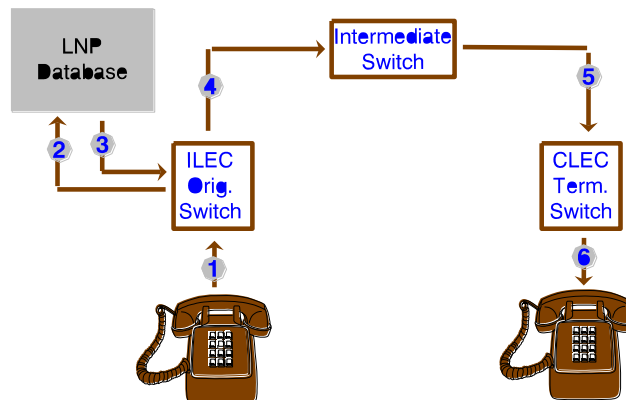
Released: March 11, 1997

APPENDIX C - DESCRIPTION OF NUMBER PORTABILITY METHODS

Steps in the call flow using **QOR**



Steps in the call flow using **LRN**



LRN cites from FCC LNP Orders

1. Location Routing Number (LRN)

Under AT&T's LRN proposal, a carrier seeking to route a call to a ported number queries or "dips" an external routing database, obtains a ten-digit location routing number for the ported number, and uses that location routing number to route the call to the end office switch which serves the called party.¹⁴ The carrier dipping the database may be the originating carrier, the terminating carrier, or the N-1 carrier (the carrier prior to the terminating carrier). Under the LRN method, a unique location routing number is assigned to each switch. For example, a local service provider receiving a seven-digit local call, such as 887-1234, would examine the dialed number to determine if the NPA-NXX is a portable code.¹⁵ If so, the seven-digit dialed number would be prefixed with the NPA and a ten-digit query (e.g., 679-887-1234) would be launched to the routing database. The routing database then would return the LRN (e.g., 679-267-0000) associated with the dialed number which the local service provider uses to route the call to the appropriate switch. The local service provider then would formulate an SS7 call set-up message with a generic address parameter, along with the forward call indicator set to indicate that the query has been performed, and route the call to the local service provider's tandem for forwarding.¹⁶

LRN is a "single-number solution" because only one number (i.e., the number dialed by the calling party) is used to identify the customer in the serving switch.¹⁷ Each switch has one network address -- the location routing number. The record and the Industry Numbering Committee (INC) indicate that LRN supports custom local area signalling services (CLASS), emergency services, and operator and directory services, but may result in some additional post-dial delay.¹⁸ LRN can support location and service as well as service provider portability.¹⁹ Finally, LRN supports wireless-wireline and wireless-wireless service provider portability.²⁰

¹⁴ See *Telephone Number Portability, Notice of Proposed Rulemaking*, 10 FCC Rcd 12350, 12364 (Notice). See also *AT&T Comments on Notice* at 18-23; *AT&T February 6, 1996 Ex Parte Filing* at 6-9.

¹⁵ An NXX code, or central office code, is the second three digits of a ten digit telephone number and identifies the service provider switch that serves a specific customer location. See *Notice*, 10 FCC Rcd at 12354.

¹⁶ This description of call flow employing the LRN method was adapted from the *Proposed Final Draft on number portability produced by the Industry Numbering Committee*. See *INC Report* at 49-51.

¹⁷ *AT&T Comments on Notice* at 20; *INC Report* at 45.

¹⁸ *INC Report* at 45.

¹⁹ *Id.* at 46.

²⁰ *Id.* at 45-58.