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CALIFORNIA
LOCAL NUMBER PORTABILITY
TASK FORCE
REPORT

February 29, 1996

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TABLE OF CONTENTS

1.0 Executive Summary
2.0 Introduction
3.0 Summary of Proposals
- 3.1 Location Routing Number
- 3.2 Release-to-Pivot
- 3.3 Carrier Portability Code
- 3.4 Local Area Number Portability
- 3.5 Non-Geographic Number

4.0 Selection Process
- 4.1 Overview of the California Selection Process
- 4.2 Technical Matrix
  - 4.2 a Development
  - 4.2.b Distribution and Responses
  - 4.2.c Technical Assessment
- 4.3 Economic Evaluation
  - 4.3 a Development of Economic Assessment Matrix
  - 4.3.b Availability of Information
  - 4.3.c Economic Assessment
  - 4.3.d Additional Economic Considerations
- 4.4 Switch Software Availability as of December 1995
- 4.5 Voting and Selection Process and Results
  - 4.5 a Options Considered
  - 4.5 b Process Description
  - 4.5.c Results

5.0. Implementation Plans
- 5.1 Review of Implementation Timing
- 5.2 Trial/Testing Issues
- 5.3 Risk Factors
  - 5.3.a Risk Factors Common to All Proposals
    - 5.3.a.1 Switch Related
    - 5.3.a.2 SMS Related
    - 5.3.a.3 General Items
- 5.4 Outstanding Implementation Issues
  - 5.4.a Deployment Plan
  - 5.4.b Non-Participating Network Issues
  - 5.4.c. SMS Development
  - 5.4.d Database/SCP Development
  - 5.4.e Service Provider Internal OSS, Billing Systems, and Methods and Procedures
  - 5.4.f Access to Number-Based Database Systems
  - 5.4.g Operator Services
- 5.5 Triggering and Routing Issues
- 5.6 Implementation Assumptions

6.0 Response to ALJ Ruling Question #4a-4g
- 6.1 (4.a)
- 6.2 (4.b)
- 6.3 (4.c)
- 6.4 (4.d)
- 6.5 (4.e)
- 6.6 (4.f)
  - 6.6.a Comparison of Plans
- 6.7 (4.g)

7.0 Recommendations

8.0 Requested Action From The Commission

Attachments

1. Task Force Participants
2. Task Force Meetings
3. Cost Information Submitted by AT&T, GTE, and Pacific Bell
4. Pros and Cons of Proposals Submitted by Evaluators
5. LNP Framework/Technical Matrix
6. Scoring Activity Results
7. Economic Assessment Matrix
8. Vendor Switch Software Availability Materials
9. CPC to LRN Draft Transition Sequence Overview from Georgia Report
10. LNP Status in Various States

1.0 Executive Summary

The California Local Number Portability Task Force ("Task Force"), formed in May 1995, and consisting of various telecommunications industry organizations, is guided by the following mission statement:

> The California Local Number Portability Task Force will evaluate, recommend, and, ultimately, implement a technically and economically feasible solution for service provider number portability that meets the needs of California consumers and carriers in a competitively neutral manner.

In pursuing this mission statement, the Task Force considered several local number portability ("LNP") proposals: Location Routing Number ("LRN"); Release-to-Pivot ("RTP"); Carrier Portability Code ("CPC"); Non-Geographic Number ("NGN"); and Local Area Number Portability ("LANP"). The proponents of each proposal prepared a summary of their proposal, and those summaries are included in Section 3 of this Report. *The Task Force takes no position with respect to the contents, accuracy or assertions contained in the proposal summaries.*

To facilitate the evaluation and selection of a long-term LNP solution, the Task Force developed a technical evaluation matrix ("technical matrix") as a tool for analyzing the technical characteristics of each proposal. The Task Force scored the proposals for their compliance with the attributes in the technical matrix. The Task Force also developed an economic matrix to assess the economic implications, and three carriers presented some economic information. Switch software availability information was also presented to the Task Force. Subsequently, the Task Force met in an attempt to select an LNP solution. Details of this selection process are set forth in Section 4.

The selection process resulted in the formulation of two differing recommendations to the California Public Utilities Commission ("Commission"):

- LRN, which employs Advanced Intelligent Network ("AIN") or Intelligent Network ("IN") triggers, external System Signaling 7 ("SS7") databases, and a location routing number.
- A routing algorithm that allows for alternative triggering mechanisms, allows the use of switch-based databases, and uses the same location routing number.

The recommendations are contained in Section 7.

The Task Force recommends that California service providers conduct testing leading to LNP implementation, rather than a trial that, once completed, is broken down and evaluated before LNP implementation. Section 5 sets forth the recommended approach for such trial/testing. During the course of its analysis, the Task Force identified certain outstanding issues which must be resolved prior to implementation. These issues and other implementation-related topics are also discussed in Section 5. Recognizing the need for implementation work, the Task Force requests in Section 8 specific Commission action to facilitate this process.

The Task Force took note of the specific issues and questions raised in the November 27, 1995 ALJ Ruling, many of which are addressed in this document as a whole. We do specifically address certain issues and questions in Sections 5.2 and 6.0.

2.0 Introduction

The Task Force was initially formed by telecommunications industry volunteers in May 1995. The Task Force developed the following mission statement during its early organizational meetings:

> The California Local Number Portability Task Force will evaluate, recommend, and, ultimately, implement a technically and economically feasible solution for service provider number portability that meets the needs of California consumers and carriers in a competitively neutral manner.

In July 1995 the Commission recognized the Task Force and validated its efforts in D.95-07-054. Further, the Commission directed the Task Force to "scope out technical criteria that need to be formulated to complete a trial/test of long-term local number portability" and to file a report with the Commission on January 31, 1996.[1] (D.95-07-054, p. 36; Administrative Law Judge ("ALJ") Ruling, August 18, 1995).

Various telecommunication industry organizations attended meetings and participated in the Task Force. Participating organizations include local exchange carriers ("LECs"), interexchange carriers ("IECs"), competitive local carriers ("CLCs"), competitive access providers ("CAPs"), wireless carriers, cable television companies and associations representing the telecommunications industry (e.g., the California Cable Television Association ("CCTA") and the National Exchange Carriers Association ("NECA")), switch vendors, Commission Advisory & Compliance Division ("CACD"), Division of Ratepayers Advocates ("DRA"), and the California Department of Consumer Affairs ("DCA"). Attachment 1 is a complete list of participating organizations.

The Task Force determined that decisions would be made by consensus. The foundation for the consensus standard used by the Task Force was the Industry Numbering Committee ("INC") definition of consensus, which is "less than unanimity but more than a majority."

The first two Task Force meetings addressed the basic organizational structure and LNP in general. The organizational structure includes three co-chairs: Pacific Bell, an incumbent LEC; MCImetro, a CLC; and AT&T, an IEC. The Task Force met on an aggressive schedule so that it could complete its "Mission" and submit its recommendations/report to the Commission in a timely manner. Attachment 2 is a complete list of the Task Force's meetings. Each of the Co-Chairs agreed to rotate hosting the meetings. The Co-Chair hosting the meetings was also responsible for recording and distributing the minutes. AT&T maintains the master list of Task Force members.

Once the organizational structure was established, the Task Force requested that presentations be made to its members by proponents of the various LNP solutions. On July 11 and 12, 1995, LNP presentations were made to the Task Force as follows:

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[1] On January 23, 1996, the Task Force requested a one-month extension to February 29, 1996. This extension was granted pursuant to ALJ ruling issued January 25, 1996.

- GTE presented its NGN proposal;
- ITN, Tandem and AG Communications Systems made a presentation on how to evolve from local number portability to national number portability;
- AT&T presented its LRN proposal;
- Sprint presented its Zip Code routing proposal;
- Pacific Bell presented its RTP proposal;
- MCI presented its CPC proposal;
- NORTEL presented information relative to local number portability; and
- ELI and US Intelco presented LANP.

After these initial presentations, the Task Force spent several meetings preparing a LNP technical matrix that would be used as a common tool when evaluating the technical feasibility of proposed LNP solutions. This matrix was mailed to each proponent of the LNP solutions presented at the July 11 and 12, 1995 meeting. Each proponent provided written responses to the Task Force to each question/attribute on the matrix. Written responses were submitted to the Task Force from the proponents of LRN, RTP, CPC, NGN, and LANP. On November 8, 9, and 10, 1995, presentations were made by the proponents that responded to the matrix.

After the presentations, the Task Force analyzed the proposals using the matrix criteria. Concurrently, the Task Force developed an economic matrix for use by the Task Force in evaluating the costs of each proposed LNP solution. Some participants (AT&T, Pacific Bell, and GTE) presented information related to the estimated costs associated with implementing each of the proposals. This cost information is included as Attachment 3.[2]

On November 27, 1995, the ALJ issued a ruling setting forth guidelines for the Task Force's Report to the Commission. Accordingly, the Task Force hereby submits this Report pursuant to the August 18, 1995, November 27, 1995 and January 25, 1996 rulings.

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[2] The Task Force takes no position with respect to the validity of any of the cost information submitted by the parties.

3.0 Summary of Proposals

The following subsections (3.1 through 3.5) have been prepared by the proponents of each of the LNP solutions evaluated by the Task Force. In addition, in response to a suggestion made by CACD, some of the evaluators[3] prepared a list of no more than three Pros and Cons regarding the LNP proposals. The Task Force agreed that the Pros and Cons provided by any one evaluator may not exceed two pages; that evaluators are not obligated to submit anything; and that the evaluators could discuss any or all of the proposals. Attachment 4 contains the Pros and Cons submitted by the evaluators. ***The Task Force takes no position with respect to the contents, accuracy, and associated assertions contained in this Section 3 and Attachment 3.***

3.1 Location Routing Number

AT&T's proposed Location Routing Number ("LRN") LNP network architecture solution is a single-number solution, consistent with the North American Numbering Plan ("NANP"). A location routing number is associated with each ported number in network routing databases, and identifies the end office switch which serves the called party. The location routing number is obtained by network switches during call processing through external database queries and the associated response.

LRN supports existing six-digit (NPA-NXX)[4] routing and may be implemented without changes to existing switch routing algorithms. In existing end offices, the location routing number would be selected from one of the end office's previously assigned NPA-NXXs. New end offices would be assigned NPA-NXXs for location routing numbers through normal number administration processes. Under LRN, a carrier seeking to route a call to a ported number will launch a query to an external routing database, obtain the location routing number for the ported number, and then use the location routing number to route the call to the proper end office where, based on the ported telephone number, the call is properly terminated. Initially, portable NPA-NXXs will be communicated to carriers via the industry SMS. Eventually, portable NPA-NXXs will be identified in the Local Exchange Routing Guide ("LERG"). Because the location routing number uniquely identifies the end office from which the called party is served, and to which the call must be terminated, efficient routing -- via either direct or tandem connections -- can be provided easily.

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[3] Those parties deemed eligible to vote on the proposals will be called "evaluators" to distinguish them from other Task Force participants.

[4] "NPA" and "NXX" refer to the first six digits of a ten-digit telephone number. The entire ten-digit number would be denoted as follows: (NPA) NXX-XXXX, where the NPA is the area code, the NXX is the prefix or central office code, and XXXX is the line number.

LRN has the following characteristics:

- Key to the functionality required in a number portable environment is the use of the location routing number, which provides a unique identification for each network switch that terminates subscriber lines. For existing switches the location routing number will be selected from within one of the existing NXXs currently assigned to that switch. For example, if a large central office switch currently employs several NXXs, one of those codes would be selected as the NPA-NXX for use as the location routing number. A given line number, not currently assigned to a customer (vacant), would be assigned within that NPA-NXX as the location routing number itself. Although it would be convenient if the same line number could be assigned in every end office to identify the location routing number (e.g., "0000"), this is unlikely, as there exist no line numbers that routinely have been set aside for non-customer use in every end office.

- Number Resources: LRN is especially effective in conserving numbering resources. It requires only one (ten-digit) number to identify each switch, and that number can be associated with all customer numbers served by that switch. The additional numbers that would be required if network addresses were associated with each customer (the dual-number solution) are not needed. Moreover, this proposal does not use numbering resources which are primarily designed for other purposes (e.g., area codes or NPAs) or require additional network intelligence that might be required to distinguish the use of such a common numbering resource as a routing code for the support of number portability.

- LRN is a "single-number solution." That is, the customer is identified in the serving switch by a single number -- the number that is dialed by the calling party to reach that subscriber -- and there is no need to provide a unique, customer-specific network address to effect call routing. Rather, all ported customer numbers served by a given switch can be associated with a single network address (the location routing number) that identifies that switch. To complete calls, the original dialed number is carried along in signaling messages and is used by the called party's serving switch to route the call to the appropriate subscriber loop.

- Implementation of the LRN single-number solution demands that end office switches recognize and complete calls associated with a large number of central office codes (NXXs) that might be included in a number portable area, and must, therefore, "open" a potentially large number of codes on the switch. Many switches already accommodate several hundred NXX codes.

- LRN supports all Custom Local Area Signaling Services ("CLASS services"). The single-number solution inherently makes available the customer number for proper presentation of caller ID and can be used by switches, along with the necessary processing, to support other CLASS-type signaling services. With a single-number approach a customer's true telephone line number, not a network address, is recorded for both ported calling and ported called numbers. Further, the single-number solution easily allows the porting of blocks of numbers served by PBXs, a capability not easily realized if each customer is assigned two numbers, i.e., an individual network address as well as a customer number.

- Auto call-back and auto recall rely largely on the knowledge of calling and called party numbers and the use of common channel signaling SS7 non-call-associated signaling messages. With LRN, both calling and called party numbers are readily available. However, the six-digit global title translations ("GTTs"), based upon NPA-NXX, used to direct non-call-associated signaling messages to the proper end office cannot provide the necessary routing in a portable environment. Rather, some form of ten-digit GTT (NPA-NXX-XXXX) is required. The LRN proposal would direct the Transaction Capabilities Application Part ("TCAP") CLASS query to the LNP database where information (e.g., a destination point code) could be obtained from the database record and the query passed directly to its appropriate destination.

- Type of Number Portability Supported: LRN can effectively support location portability and service portability as well as service provider portability, as any dialed number theoretically can be mapped to any location routing number and routed accordingly. Although implementation of widespread location portability adds to the complexity of call rating and originating call processing, LRN does not preclude the introduction and deployment of location portability. For local calls the query is made by the originating LEC/CLC, for interLATA calls by the IEC, and for intraLATA toll calls by the service provider selected to handle the call. Moreover, the LRN solution can be used with default routing. That is, in those situations where the originating local service provider cannot provide the database query on a local call, or where an interLATA call is handled by an IEC who cannot support the query function, the call will be forwarded to the terminating local service provider originally assigned the NPA-NXX of the dialed number according to the LERG database. That service provider would perform the query, retrieve the location routing number and appropriately route the call to the specific switch in the network of the local service provider which now serves the called party.

- SMS Database: LRN involves network switches, network routing databases, both centralized and optional carrier-specific Service Management Systems ("SMS"), and the signaling network which supports these elements. A location routing number is assigned to every network switch which serves customer lines. The industry forum INC assumes that the SMS will be regional and that the network routing databases will likely be located within each major service provider's network. Alternatively, service providers may choose not to deploy routing databases in their own networks, but to obtain access to external routing databases through business arrangements with other service providers or third-party vendors. Finally, the use of carrier-specific SMSs should provide a given network provider greater flexibility and control over data which is downloaded into service provider's routing databases. Such carrier specific SMSs are not required, however, as routing information could be downloaded directly from the regional SMS to network routing databases.

- The single ten-digit number assigned as the location routing number will not typically be used for customer service. This number, however, is the only number within the NXX code which is not readily available for customer assignment.[5] In addition, the NPA-NXX selected for use for the location routing number in a given office cannot be an NPA-NXX associated with (i.e., assigned to) any other office. Accordingly, a new central office must receive, as the NPA-NXX from which the location routing number will be assigned, an NPA-NXX which is unique. This assignment rule is consistent with the manner that central office codes are assigned today, and eliminates the possibility that routing would have to be performed in two "domains" one for the routing of location routing numbers and another for routing of NPA-NXXs assigned to offices where portability is not yet implemented.

- E911 Impacts: Maintenance of emergency services (911/E911) in a number portable environment is dependent upon the availability of a dialable customer number at the Public Safety Access Point ("PSAP"). The LRN proposal meets this requirement because the dialable number, of the calling party, rather than the network address, is readily available.

- Post-Dial Delay: LRN may cause additional post-dial delay for every interoffice call within a portable NPA-NXX. Any incremental post-dial delay is expected to be insignificant compared to post-dial-delay factors already present in every call.

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[5] Although not recommended, it is technically possible to assign the location routing number as a customer number and to properly distinguish this number, either as the location routing number or a customer number, for appropriate and proper call completion.

- Compatibility with Wireless Networks: The Task Force has been focused on wireline number portability. However, given that LRN is a single-number solution, it preserves the integrity of the calling party's number originating from a ported wireline number terminating on a wireless carrier's network. LRN supports wireless originating calls to wireline ported numbers in the same way that it supports terminating calls from any non-participating carrier. LRN will be migratible to wireless carriers when those carriers are ready to implement service provider number portability.
- Fault-Tolerant Network: LRN uses a master SMS database supporting a network of fully synchronized SCP computers connecting to the fault-tolerant SS7 network. This system of geographically dispersed, fully duplicated computers, connected to multiple, fully redundant STPs, provides a signaling system that will have virtually 100% availability over a ten year period. Human input data errors will account for essentially all of the reasons for call failures. However, the mean time to repair these call failures is under two minutes, compared with hardware failure repair times of from hours to days for switch-based databases.

3.2 Release-to-Pivot

Release-To-Pivot ("RTP") is a generic capability that can accomplish service provider number portability. Calls using RTP will attempt to complete all calls as they presently do to a switch that is assigned a given NPA-NXX. If the dialed number has been ported from the switch (Release switch), the call will be released back to a previous switch (Pivot switch) in the call path for rerouting to its new location. When the call is released back, Rerouting Information ("RI") is included so that the call can be completed to the new location. The Pivot switch will use this RI to reroute the call to the new serving switch. A major feature of RTP, that provides greater technical and economic efficiency, is if the dialed number has not been ported it will complete exactly as it does today. This functionality is accomplished by equipping switches in a network with Release and Pivot functionality. The functionality can be resident in the same switch or can be in separate switches.

RTP uses the existing switching infrastructure and signaling network to accomplish service provider number portability; an internal rather than an external database is used for call setup. If the Release switch and Pivot switch are separate switches it is, however, necessary that they, as well as any switches between them, be SS7-capable. Other switches in the call path need not be SS7-capable. The key network components required are switches (end office and tandem), interoffice facilities, STPs, and SS7 signaling links.

There is no impact to the originating switch if it is not the Release or Pivot switch. Tandem switches may be required to be pivot capable. Translation changes will be required in Pivot switches, Release switches, and destination switches with RTP.

RTP is transparent to end users. It is a generic network capability that is service dependent; it is not invoked by end users. Functionality and quality of service are not affected with RTP.

With RTP, customers who choose not to port will receive the same service as they do today. RTP will not affect the reliability of calls to non-ported customers unlike other proposals that require database queries whether or not the called number is ported. In addition, with RTP, the universe of calls affected by a database failure (i.e., switch failure) is much smaller than alternatives that require large databases (e.g., Service Control Points ("SCPs")) to serve multiple switches. Pacific Bell presented an analysis to the Task Force that clearly showed RTP's superiority to other alternatives in a number portability environment from a network reliability standpoint.

RTP has the following characteristics:

- E911 Impacts: With RTP, calls will be routed to the proper PSAP. The calling party number will be forwarded to the PSAP so services that use the calling party number will continue to operate. There should be no impact on call set-up time and post dial delay for 911 calls from either ported or non-ported numbers. There should be no impact on 911 call completion rates from ported or non-ported numbers.
- SMS Database: All LNP alternatives require an SMS database. With RTP, existing switch provisioning systems will use the information provided by the industry-wide SMS to update switches with the required information. The Task Force has not yet determined SMS requirements or performance criteria.
- Post-Dial Delay: RTP will not add incremental call set-up time or post-dial delay for calls to non-ported numbers. The incremental call set-up time and post-dial delay for calls to ported numbers has not been verified in a live network, but will primarily consist of the time to send an Initial Address Message ("IAM") (with Carrier Identification ("CI")), determine that the number has been ported from the Release Switch, formulate and send a RELease (with RI) message, and the time to translate the RI information into a new IAM (or equivalent) for forwarding to the final destination switch. In summary, this approach has less impact than other solutions.
- Compatibility with Wireless Networks: Based on discussions in the Task Force, it is assumed that porting will not take place between wireline and wireless networks. RTP can be used in wireless networks to implement number portability. RTP will not delay availability of number portability in wireless networks.
- Type of Number Portability Supported: RTP can support service provider number portability as well as service portability if the service uses ISDN User Part ("ISUP") call set-up messaging. RTP can also support location portability; however, the extent of location portability (e.g., national) that can be reasonably supported is not clear and requires further study.
- Numbering Resources: RTP using the location routing number as a routing mechanism is a single-number solution; no negative effects on numbering resources are incurred.

- RTP can co-exist with other number portability alternatives as long as each alternative uses the same routing and signaling protocols. Pacific Bell's position is that the location routing number accomplishes this by standardizing what is passed at the network interface. The location routing number provides a routing number that conforms to existing forward routing principles and additional parameters can be included to inform networks in the forward call path that a query has been performed and the original dialed number is included in the appropriate call set-up message. Whether the information to properly route the calls is obtained from an external database or a switch-based database should be determined by the service provider as long as the chosen method delivers the correct information to the network interface.

3.3 Carrier Portability Code

This interim database solution is based on a three-digit Carrier Portability Code ("CPC") assigned to each local service provider within an NPA. An SMS database for a given region will contain the CPC along with the telephone number for every number that is ported. Under this proposal, a service provider, in seeking to terminate a call, will query a routing database containing information downloaded from the SMS. The query will return a ten-digit number: the three-digit NPA replaced with the CPC of the LEC serving that customer, plus the customer's seven-digit telephone number. The call will be routed to the location pre-designated by the terminating carrier based on the six-digit CPC-NXX.

CPC has the following characteristics:

- CPC supports queries by the next-to-last ("N-1") service provider and therefore does not require calls to be routed through or use the incumbent LEC's network.
- CPC allows for vertical services to be offered to customers who port their numbers.
- CPC allows each service provider to own or provide for the routing databases in its network, permitting it to make its own network engineering decisions and control its own costs.
- CPC, because it relies on existing standards and capabilities, can be implemented in 1996, although more realistically in early 1997 because Nortel's upgrade is not available until Fourth Quarter 1996.
- Under CPC, calls are routed to the service provider's pre-designated location. This could produce routing inefficiencies since, in some cases, calls are not routed directly to the end office serving the customer and would require additional transport to the serving end office.

- The three-digit CPC will ultimately put pressure on numbering resources because it requires significant numbers of NPA codes. For example, in a territory comprised of four area codes where three wireline service providers choose to provide local service, twelve CPCs would be required. These CPCs could not be duplicated as NPAs within that territory. If, in this example, two cellular providers and two Personal Communications Services ("PCS") licensees also decide to offer service, this would become a greater problem. It has been proposed that CPCs would be assigned from the block of 80 NPA codes reserved for future expansion under the NANP. However, in a large metropolitan area, these codes would be used up quickly, resulting in the need to reuse codes and the need to assign the same CPC to different carriers in different NPAs. Over a long period of time, it might become necessary to designate codes as both NPAs and CPCs, which would require service provider networks to be able to differentiate between the three-digit code dialed by an end user representing the NPA and the same three-digit code returned from a database query representing a service provider in a different NPA. It is generally agreed that this would not be acceptable to the industry.

Primarily due to these last two bullet points, it is generally agreed by the industry that CPC is not viable as a permanent solution. However, CPC should be considered as a viable interim approach that is superior to RCF and DID alternatives. MCI proposes adoption of CPC for use until a permanent solution is available.

3.4 Local Area Number Portability

The US Intelco Local Area Number Portability ("LANP") proposal is a dual domain solution in that each customer is assigned a ten-digit customer number address ("CNA") which is mapped to a unique ten-digit network node address ("NNA"), both of which are stored in routing databases. The NNA initially identifies both the subscriber's terminating end office and the line or trunk over which a call is terminated. This is required today because switches cannot translate a prefix which is not open on the switch to a line termination. In addition, existing Carrier Access Billing systems are not capable of distributing calls and revenues on a ten-digit basis. The CNA is the number that is dialed to reach the subscriber. Thus, each CNA has an associated unique ten-digit NNA in the interim. The NNA space can be migrated to one number per switch as the software becomes available on a switch-by-switch basis (i.e., the dual domain system with one NNA per CNA can work now as a database Remote Call Forwarding ("RCF") and convert on a switch-by-switch basis to the one-NNA-per-switch model of LRN). For each ported telephone number, the SMS database would be populated with, among other information, the NNA. Service providers would download this information into their routing databases where each ported telephone number would have an associated NNA. If RCF is the only interim method of service provider number portability, LANP can be used to correct the call routing and billing of RCF and to convert the "two-call" model of RCF into a one-call model with the switched access revenues going to the true terminating service provider. This capability was fully tested in the Seattle trial and works better than switch-based RCF.

Under LANP, service providers seeking to route a call to a ported number will receive the called number, the CNA, launch a query to a routing database, translate the called number from its CNA to its associated NNA, use the NNA to route the call, and pass the NNA to the serving end office which, based on the NNA, will terminate the call to the appropriate line or trunk.

US Intelco also advocates the use of LANP as an interim database solution to replace RCF.

LANP has the following characteristics:

- E911 Impacts: As with RCF, the information displayed at the PSAP initially will be the NNA in the Automatic Number Identification ("ANI") field with the CNA in the notes field. As the switches are modified to enable the sending of the Calling Party Number in the ANI field, the CNA will replace the NNA as the ANI. This feature is also required if the RCF mode of number portability is to remain in operation for more than a short period of time or if the NGN approach is adopted.

- Fault-Tolerant Network: This proposal uses a master SMS database feeding a network of fully synchronized SCP computers connecting to the fault-tolerant SS7 network. This system of geographically dispersed, fully duplicated computers, connected to multiple, fully redundant STPs, provides a signaling system that will have virtually a 100% availability over a ten year period. Human input data errors will comprise over 99% of the reason for call failures, however, the mean-time-to-repair of these call failures is under two minutes compared with hardware failure repair of from hours to days for switch-based databases.
- Post-Dial Delay: All calls, both ported and non-ported, will experience no difference in post-dial delay. Actual measured results, in the Seattle field trial, indicate that the change from the current SS7 call set-up time, in the worst case, is no more than 50 milliseconds.
- Wireless Network Impact: The dual domain system does not require changes in the wireless networks and is compatible with the dual domain system of number administration used today for the Home Location Register database and the Foreign Location Register databases.
- Type of Number Portability Supported: LANP supports interim number portability as a database RCF, and it supports service provider, service and location portability. The location portability can be local, regional or national.
- Numbering Resources: LANP allows the complete use of the NANP resource for customer numbers. Once the routing number is separated from the customer number, the customer numbers can be disassociated from the switches. This allows all reserved and vacant numbers to be moved from the switch to a common pool of numbers. Based on the 800 portability model, the effect will drive number utilization from 40% when number exhaust is declared to 85% before number exhaust is declared. Switch-based databases require that the entire NXX of 10,000 numbers be assigned to one service provider switch. These numbers are therefore not available to other service providers for customer assignment (numbers cannot be assigned to customers by another service providers until they are first assigned to a customer and then ported to another service providers).
- Transition Plan: LANP can be used to replace switch-based RCF while building the LRN database to allow a smooth transition from call forwarding to LRN. If Route Indexing is offered as a form of interim service provider portability, CPC and LANP can co-exist in the same database.

3.5 Non-Geographic Number

Non-Geographic Number ("NGN") is designed to offer LNP to subscribers who desire this capability without affecting the quality of service of the non-subscribers, while minimizing any impact on existing networks. It is an overlay network using the existing routing mechanism and billing methods.

The NGN approach is also designed to support service provider number portability, location portability, and service portability. Since the use of a non-geographic NPA does not indicate any specific geographic location, the non-geographic number is especially suitable for location portability.

The major concept of the NGN approach is that a ported subscriber will be assigned an easily recognizable non-geographic number, such as 333-NXX-XXXX. The customer is also assigned a geographic number which indicates the customer's physical location and the serving central office. When the customer moves or changes the local service provider ("LSP"), he/she can retain the non-geographic number, while the geographic number ("GN") will be changed to reflect the new location or the new serving Central Office. Conceptually, the NGN approach is similar to the existing 800 service, except 800 service is a called party paid service, while with LNP the calling party pays for the call.

With the NGN solution, every LNP customer is assigned a non-geographic number and a geographic number. When a customer dials a LNP customer's NGN, the NGN is translated into the GN. The call is routed based on the called customer's GN as is done today.

This solution does not require changes in the signaling messages. As discussed above, the GNs for the calling and called parties are used in the SS7 messages. Thus, the calling party ANI received at the called party is the calling party's geographic number. If the calling customer is a LNP customer, the called customer must use the calling customer's geographic number for selective call acceptance and selective call reject.

NGN has the following characteristics:

- NGN uses existing routing and signaling systems without requiring any changes. Therefore, no changes to SS7 messages are required to implement NGN.
- NGN requires a database dip for only those calls to ported numbers. A call to a non-ported number is routed as it is today without LNP. A call to a ported number (i.e., the non-geographic number) requires a database query to translate the NGN into a corresponding GN. In the SS7 messages, only the GNs are included.

- NGN requires minimal changes to switching equipment. If IN triggering is used in a switch, a minor modification on the IN software is needed. If AIN is used, the current 3/6/10 digit public office dialing plan ("PODP") trigger can be used. The switch table will store the geographic number as it is today. In addition, not every switch needs to perform the database query. For switches not performing database queries, calls to ported numbers can be routed to the tandem switches where the database dips will be performed.

- In the NGN approach ported numbers are non-geographic. NPA relief activity resulting in an NPA split will require only customers with non-ported numbers in the new geographic NPA area to change their numbers. Customers with NGN ported numbers will not have to change their ported number.

- In the NGN approach only ported calls need number translation. These calls are easily recognized by the originating switch by their unique non-geographic NPA. All other calls to non-ported customers are completed just as they are today. Thus, only calls to LNP customer's require additional processing.

- NGN has many similarities to the existing 800 service and, therefore, it is estimated that the time to implement this solution could be compared to the time it is taking the industry to expand 800 service to the 888 code.

- In the NGN approach, a customer who desires the LNP capability will be assigned a new non-geographic number. The customer will use this non-geographic number, not the existing geographic number, as his LNP number.

- NGN uses the existing SS7 network and message sets. In the SS7 IAM messages, only the calling and called parties GNs are used. Thus, the calling party ANI received at the called party is the calling party's geographic number. If the calling customer is a LNP customer, the called customer needs to use the calling customer's geographic number for selective call acceptance and selective call reject.

4.0 Selection Process

4.1 Overview of the California LNP Selection Process

The Task Force developed the following criteria to determine which organizations would be eligible to vote on the LNP solutions.

1. A party must have a material interest in California network operations;
2. A party was required to attend all the proposal presentations during the meetings held November 8, 9, and 10, 1995; and
3. A party was required to attend the evaluation meetings held November 30 and December 1, 1995.

Although they did not meet the "material interest in the network" criteria, DRA and DCA were also eligible to vote, provided that they met the two attendance requirements set forth above. Similarly, although CCTA will not itself be investing in the network, CCTA was eligible to vote on behalf of its members who had applied for Certificates of Public Convenience and Necessity but who were not individually represented in the Task Force. The Task Force decided that NECA should not vote because it represented LECs who were already represented within the Task Force.

The Task Force adopted a "one company, one vote" standard for all carriers on the Task Force. This standard dictated that each participating service provider would receive only one vote, although it may have had several affiliates or subsidiaries attending the Task Force meetings. For example, AT&T would receive only one Task Force vote despite its participation in the Task Force as a CLC applicant, an IEC, and a wireless service provider. However, those service providers with wireless affiliates (e.g., Pacific Bell and Pacific Bell Mobile Services, AT&T and AT&T Wireless, GTE and GTE Mobilnet) did have the opportunity to cast one vote on the wireless portion of the technical matrix in addition to their one vote on the wireline portion.[6]

Several disputes arose within the Task Force regarding the voting rights of certain parties. For example, some participants argued that GTE California and Contel should not both have a vote because the Commission approved a merger of the two companies in February 1995. The CACD representative in the Task Force suggested that both companies should be allowed separate votes at this time because the two companies are still operating separately. However, the CACD representative pointed out that the Commission might later decide not to accord the full weight to each company's vote if the GTE/Contel merger is consummated before the Task Force completes its work.

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[6] The wireless service providers opted to vote as a block in evaluating the wireless section of the technical matrix. However, at the Selection Meeting on December 15, the wireless service providers voted individually because they had insufficient time to caucus prior to the vote. The result was that during the Selection Meeting, both the wireline service provider and the wireless affiliate each had a vote. See Section 4.5c, for detailed description of the selection process and voting results.

Some Task Force members also argued that ELI and Citizens should not be given two separate votes because they are jointly owned and are jointly represented before the Commission. The Task Force ultimately decided to give ELI and Citizens two separate votes because the two companies actually compete with one another, are separately operated, and have separate boards of directors.

The evaluators were:

- AT&T and AT&T Wireless
- AirTouch Communications
- California Cable Television Association
- California Department of Consumer Affairs
- Citizens Telecom
- Contel of California and Contel Cellular
- Cox Enterprises
- Division of Ratepayer Advocates
- Electric Lightwave Inc.
- Falcon Cable Systems
- GTE California Incorporated and GTE Mobilnet
- Los Angeles Cellular
- MCI and MCImetro
- MFS Intelenet of California, Inc.
- Pacific Bell and Pacific Bell Mobile Services
- Roseville Telephone Company
- Teleport Communications Group
- Time Warner AxS

The selection process followed by the Task Force was to:

1. Assess the appropriateness and usefulness of evaluation criteria used in other states, and amend the criteria to reflect the California requirements.
2. Issue the technical matrix as a request for information ("RFI") to all companies that made presentations at the July 11 and 12 Task Force meeting.
3. Entertain formal technical presentations from proponents of each LNP proposal.
4. Perform a comprehensive evaluation of the proposals.
5. Attempt to reach consensus on a single recommended long-term LNP solution.