

# NORTH AMERICAN NUMBERING COUNCIL LNP ARCHITECTURE & ADMINISTRATIVE PLAN

On July 2, 1996, in its First Report and Order and Further Notice of Proposed Rulemaking in CC Docket No. 95-116, the FCC directed the North American Numbering Council (NANC) to make several specific determinations regarding the selection of NPAC vendors, the overall national architecture, and technical specifications for regional databases. The NANC established the LNPA Selection Working Group and two *task forces*, including the LNPA Architecture Task Force, to review and make recommendations on these issues. The LNP Architecture Task Force developed the LNPA Architecture & Administrative Plan, which was forwarded to the FCC on May 1, 1997, as an attachment to the LNPA Selection Working Group Report. This report made recommendations concerning LNP architecture, including endorsing a regional NPAC structure. The report and attachments were released by the FCC for public comment followed by release of the LNP Second Report and Order in CC Docket No. 95-116, on July 27, 1997. In this order, the FCC adopted all of the recommendations made in the LNPA Selection Working Group Report, including those contained in the LNP Architecture & Administrative Plan, Issue 1, Revision 3, April 25, 1997.

Section 7, Future Role, of the LNPA Selection Working Group Report outlined seven (7) areas relating to future LNP implementation activities, including integration of wireless into LNP. This was necessary as the original report was developed from a wireline only perspective. In June 1997, the LNPA Selection Working Group established a subgroup to develop a work plan for accomplishing the integration of wireless into LNP, as well as to address several other of the areas defined in the Future Roles section of the report. This activity led to the formation of the Wireless and Wireline Integration Task Force (WWITF) which was established to make recommendations on the following areas from the FCC's Second Report and Order:

- Modifications to the NANC Functional Requirements Specifications (FRS), which defines the requirements for the NPAC SMS, as necessary, to support wireless number portability<sup>2</sup>
- Modifications to the NANC Interoperability Specifications (IIS), which defines the requirements for the mechanized interfaces with the NPAC, as necessary, to support wireless number portability<sup>3</sup>
- Monitor industry efforts to develop technical solutions for implementing wireless number portability<sup>4</sup>
- Develop wireless recommendations to the FCC no later than nine (9) months after release of the Second Report and Order (i.e., May 18, 1998)<sup>5</sup>

<sup>2</sup> Second Report and Order in CC Docket No. 95-116, Paragraph 61

<sup>3</sup> Id. at Paragraph 64

<sup>4</sup> Id. at Paragraph 92

<sup>5</sup> Id. at Paragraph 91

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The WWTF, which meets monthly or more frequently if needed, is open to all concerned parties and is representative of all segments of the telecommunications industry.

## 6. PERFORMANCE CRITERIA

The FCC adopted in its original order the following minimum performance criteria. Any long-term number portability method, including call processing scenarios or triggering, must:

- (1) support existing networking services, features, and capabilities;
- (2) efficiently use numbering resources;
- (3) not require end users to change their telecommunications numbers;
- (4) Deleted<sup>6</sup>
- (5) not result in unreasonable degradation in service quality or network reliability when implemented;
- (6) not result in any degradation of service quality or network reliability when customers switch carriers;
- (7) not result in a carrier having a proprietary interest;
- (8) be able to accommodate location and service portability in the future; and
- (9) have no significant adverse impact outside the areas where number portability is deployed.

The FCC added in the Second Report and Order that wireless nationwide roaming must be maintained. In order to accomplish this criterion, certain mandatory network upgrades are required for those wireless carriers, which process Mobile Identification Numbers (MINs). These wireless carriers must be able to associate a MIN with the specific Mobile Directory Number (MDN), whether the number has been ported or not. Failure to implement these upgrades throughout the industry in a consistent manner would adversely effect various services, such as, billing of toll calls, calling number display, and E911. These changes may not required by those wireless carriers utilizing IMSI numbering resources, such as, Global System for Mobile Communications (GSM) based wireless carriers.

## 7. LNP ASSUMPTIONS

### 7.1 Service Provider Definition

In the context of LNP, a Service Provider is a facility (switched) based<sup>7</sup> local exchange carrier or CMRS provider certified or licensed by the appropriate regulatory body or bodies.

<sup>6</sup> Item (4) was deleted in the First memorandum Opinion and Order on Reconsideration adopted March 6, 1997 and released on March 11, 1997.

<sup>7</sup> The term facility based is used in this document to describe carriers who own or lease switching equipment.

## **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 Wireline 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.

## **7.4    *NPAC LNP Databases Content***

The NPAC LNP database contains only ported numbers and the associated routing and service provider information.

## **7.5    *Line Information Data Base (LIDB) And Custom Local Access Signaling Services (CLASS)***

The new service provider has the responsibility to populate the appropriate LIDB and CLASS information associated with the ported telephone number.

## **7.6    *Line Based Calling Cards***

When a telephone number is ported the non-proprietary line based calling card number will be deactivated by the old service provider and may be activated by the new service provider offering a line based calling card service. There are currently billing fraud and other technical concerns with non-proprietary line based credit cards which limit their provision to the new service provider. If the new service provider does not offer a non-proprietary line based calling card, the customer is not precluded from obtaining a proprietary line based card from another service provider.

## **7.7    *Porting of Reserved & Unassigned Numbers<sup>8</sup>***

### **7.7.1    *Reserved Numbers***

Telephone numbers that are reserved for a customer under a legally enforceable written agreement should be ported when the customer changes service providers.

- 1) Reserved numbers that have been ported must be treated as disconnected telephone numbers when the customer is disconnected or when the service is

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<sup>8</sup> It will be the responsibility of the service provider receiving the ported reserved telephone numbers to provision their network elements so that appropriate treatment by the recipient switch is provided which suppresses cause code 26 release messages for the ported reserved telephone numbers only.

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moved to another service provider and the reserved numbers are not ported to subsequent service providers:

- 2) Reserved numbers that are ported may not be used by another customer.
- 3) Implementation of the capability to port reserved numbers may require modifications to operation support systems and may not be available initially.

## **7.7.2 Unassigned number/Unreserved**

Service Providers will not port unassigned numbers unless and until there is an explicit authorization for such porting from a regulator with appropriate jurisdiction.

## **7.8 N-1 Call Routing**

Each designated N-1 carrier is responsible for ensuring queries are performed on an N-1 basis where "N" is the entity terminating the call to the end user, or a network provider contracted by the entity to provide tandem access. Examples of N-1 routing are found in Attachment A.

## **7.9 Disconnected Telephone Numbers (Snap-back)**

When a ported number is disconnected, that telephone line number will be released (Snap-back), after appropriate aging, back to the original Service Provider assigned the NXX in the LERG.

## **7.10 Default Routing Overload and Failures**

Unless specified in business arrangements, carriers may take carrier specific action to block default routed calls incoming to their network in order to prevent imminent overload, congestion, or failure propagation that are caused by the defaulted calls. In general, overload conditions, a carrier may take network management controls that limit call attempts for all service providers (eg: call gapping).

## **7.11 Number Pooling**

The FCC Order on LNP provided no explicit guidance on number pooling. Various industry activities are underway addressing this issue and Number Pooling is outside the scope of this Task Force.

## **7.12 NPAC to LSMS Architectural Restrictions**

All networks will rely on the NPAC database as the ultimate source of porting data. Synchronization of networks to a single set of routing data is paramount to network operations. Therefore appropriate restrictions must be placed upon how these network elements may interconnect from an architectural perspective.

Specifically, the NPAC shall download relevant porting data required by participating carriers or their agents for the specific subset of network nodes. Consequently, the NPAC system shall be the source of all porting data for all carriers or agents of those carriers; thereby being the sole originator of all downloads.

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As a result of these restrictions, the LSMS must operate as the intermediate database management system, which receives, downloads from the NPAC, and then further downloads directly to the appropriate SCP functionality in its associated network(s).

Through this architecture, it is intended that if a systems provider is performing a service management functionality, then this systems provider is responsible for contributing its appropriate share of the economic support (as determined via regulatory actions on cost allocation) to the NPAC. The local SMS architecture must not allow service providers to avoid their allocation of the shared NPAC costs. Such architecture does not preclude the implementation of the LSMS functionality in a distributed manner in an individual service provider's network.

### **7.13 High Volume Call In Numbers (Choke Network)**

An area of concern regarding LNP is High Volume Call In (HVCI) networks. When a carrier determines that a customer regularly generates large volumes of terminating traffic, the customer may be moved over to an HVCI network. Examples of these types of customers could be radio stations that regularly hold contests that require many participants to call in a short period of time. An HVCI network allows all such customers to be assigned numbers in an NPA-NXX (e.g., 213-520) dedicated for HVCI. This HVCI number is the number that is announced for any high call in event. Switches in the area can be designed to segregate traffic for HVCI numbers and route it via trunk groups that are dedicated to the network and do not overflow to other trunk groups. The dedicated trunks are engineered to handle limited traffic and, in this way traffic is throttled and cannot congest the network. Such networks have proven to be effective in limiting the effects of large call in events.

However, with LNP before route selection takes place a database query is performed on calls to portable NPA-NXXs. If HVCI numbers are portable, they can generate large volumes of queries that can congest the signaling links and SCPs. Also if the HVCI number is ported and an LRN is returned in the database response, the call will not be routed via HVCI-dedicated trunks. The LNPA working Group addressed the issues surrounding porting of HVCI numbers from October 1997 through February 1998 and provided a recommendation to the NANC in a report dated February 18, 1998. The recommendation included a process that uses a dedicated choke trunk group from the ILEC choke serving office using either a pseudo NXX code or route indexing to deliver calls to the service Provider's end office. In addition, the report included the following three conditions for information:

1. The report allows for requests for modifications to this process based on evidence that it fails to meet FCC performance criteria for LNP
2. Service Providers are responsible for the provision of network facilities on their side of the interconnection point from the choke trunk groups to the choke serving office

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3. To conserve numbering resources, a request will be made to the Industry Numbering Committee (INC) to develop a plan to share existing and future HVCI numbering resources.

For complete details of the agreement see Section 3 of the LNPA Working Group High Volume Call-In Network report to NANC dated February 18, 1998.

## **7.14 Wireless/Wireline LNP Technical Assumptions**

### **COMMON:**

1. In the context of Service Provider Portability the NPA-NXX is associated with a single rate center.
2. Call rating to the caller is based upon the NPA-NXX of the called TN.

### **WIRELINE PORTING:**

1. A wireline subscriber's physical location must be in the same Rate Center as defined by the wireline subscriber's NPA-NXX.
2. When porting to a wireline service provider, Common #1 above still applies.

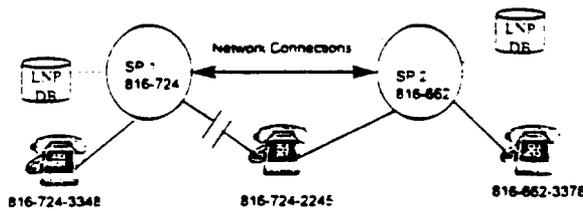
### **WIRELESS PORTING:**

1. Wireless subscriber's physical location may be different than the Rate Center defined by the NPA-NXX.
2. Porting to a wireless service provider can occur as long as the rate center associated with the porting TN is geographically located within the serving area of the ported to Wireless Service Provider and the Wireless Service Provider has or establishes a business or interconnect arrangement for incoming calls to the ported TN.

## **8. LNP Call Scenarios - Local to Local View**

LNP call scenarios on Service Provider Portability are shown in Figure 2. See additional scenarios in Attachment A for N-1 Call Routing.

Local Number Portability (LNP)  
Service Provider Portability



All Scenarios – 816-724-2245 changes service providers from SP 1 to LEC2  
NXX s 724 and 662 are considered ported NXX s

**SCENARIO 1:**

- 1 724-3348 calls 724-2245
- 2 724-2245 cannot be found on SP 1 s switch so, a query is launched to the SP 1 s LNP Database to determine the LRN for 724-2245  
The LRN returned is 816-662
- 3 The call is routed to LRN 816-662, SP 2 s switch
- 4 SP 2 terminates the call to 724-2245

**SCENARIO 2:**

- 1 662-3378 calls 724-2245
- 2 The number is found on the SP 2 switch and the call is terminated. No query is required

**Scenario 3:**

- 1 724-3348 calls 662-3378
- 2 The 662 NXX is identified as a ported NXX and a query is launched to SP 1 s LNP Database to determine the LRN for 662-3378  
A continue message is returned and the call is routed via normal network routing
- 3 The call terminates to SP 2 s switch
- 4 SP 2 s switch terminates the call to 662-3378

insports.pdf

Figure 2

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## 9. NPAC Regions

The following number of Number Portability Administration Center (NPAC) regions, their geographic coverage areas, and the NPAC assignment of Canada and the U.S. Caribbean are shown in Figure 3 and Chart 1:

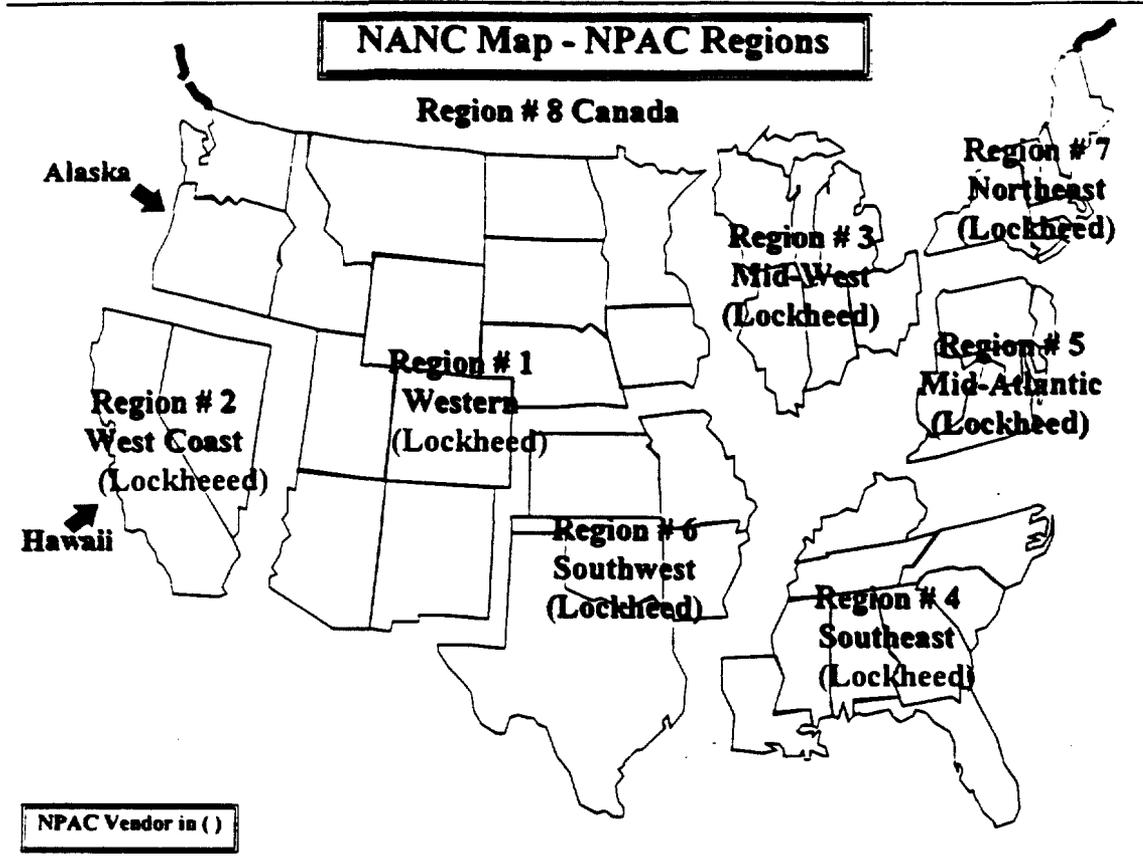


Figure 3

Factors considered in developing the NPAC regions were:

- ⇒ Economic efficiency and administrative simplicity -- On these factors, having multi-state NPACs is clearly superior to either an NPAC for each state or a single NPAC for the entire country.
- ⇒ Existing LLCs -- Each proposed region has an LLC which has chosen an NPAC vendor. The work at the state level should be built upon rather than re-invented.
- ⇒ Uniform sizes -- The sizes of the proposed regions are roughly comparable.
- ⇒ Existing regulatory structures -- State PUCs have formed regional associations that correspond to the proposed NPAC regions. These associations were formed to allow the PUCs to deal jointly with a Regional Bell Operating Company.
- ⇒ National responsibilities -- The NANC Architecture Task Force recognizes that Canada intends to create its own NPAC to serve all of Canada.

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**GEOGRAPHIC COVERAGE CHART**

<u>RECOMMENDED NPAC REGIONS</u>	<u>SPECIFIC STATES per NPAC REGION</u>
<b>Region # 1: WESTERN</b>	Washington, Oregon, Montana, Wyoming, North Dakota, South Dakota, Minnesota, Iowa, Nebraska, Colorado, Utah, Arizona, New Mexico, Idaho, Alaska, Guam, Northern Mariana Islands
<b>Region # 2: WEST COAST</b>	California, Nevada, and Hawaii
<b>Region # 3: MID-WEST</b>	Illinois, Wisconsin, Indiana, Michigan, and Ohio (including the entire Cincinnati Bell Telephone operating territory)
<b>Region # 4: SOUTHEAST</b>	Florida, Georgia, North Carolina, South Carolina, Tennessee, Kentucky, Alabama, Mississippi, Louisiana, and the US Virgin Islands
<b>Region # 5: MID-ATLANTIC</b>	New Jersey, Pennsylvania, Delaware, Maryland, West Virginia, Virginia, and Washington, D.C.
<b>Region # 6: SOUTHWEST</b>	Texas, Oklahoma, Kansas, Arkansas, and Missouri
<b>Region # 7: NORTHEAST</b>	Vermont, New Hampshire, Maine, New York, Connecticut, Rhode Island, Massachusetts, and Puerto Rico
<b>Region # 8: CANADA</b>	All Provinces

Chart 1

1. The NANC Architecture Task Force recommends seven (7) NPACs to cover the 50 United States and the U.S. territories in the North American Numbering Plan Area (e.g. U.S. Virgin Islands and Puerto Rico). Refer to the Chart 1 for specifics.
2. Canada has selected an NPAC vendor and is in the process of creating an NPAC region to serve all of Canada.

**10. NPA NXX Assignments - Ported Numbers**

The NPA NXX XXXX's (Ten Digit Phone Numbers) for ported numbers are assigned to their respective NPAC regions. Uploads and downloads via the SOA and LSMS interfaces, respectively, are transmitted to and from their assigned NPAC platforms.

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**11. Virtual NPACs**

Virtual NPACs are not precluded. If an NPAC vendor wins two or more regions, that vendor is not precluded from serving one or more of the regions on the same platform as long as the vendor meets all service requirements as specified in the contract or in End User Agreements.

**11.1 NPAC SOA and LSMS Link(s)**

Under the Virtual NPAC arrangement, Service Providers are not precluded from accessing the vendor's one NPAC platform for SOA and LSMS functionality via one or more physical links. Link capacity limitations, such as reliability and performance requirements will determine the quantity of physical SOA and LSMS link(s).

The service provider is responsible for contributing its appropriate share of the economic support to the NPAC vendor for each region in which it operates.

**11.2 Point of Presence (POP)**

The NPAC vendor will provide the physical links (SOA/LSMS) from the NPAC platform to each respective POP (Physical Facility) as identified by each regional LLC. Each service provider or its agent that directly connects to the NPAC shall be required to provide SOA and/or LSMS connectivity to the POP.

**12. NPAC CERTIFICATION PROCESS**

**12.1 TECHNICAL REQUIREMENTS**

**12.1.1 IIS**

The NPAC vendor(s) and any entity directly connecting to the NPAC platform are required to use the current NPAC SMS Interoperable Interface Specification (IIS) as adopted by NANC.

**12.1.2 FRS**

The NPAC vendor(s) and any entity directly connecting to the NPAC platform are required to use the current NPAC SMS Functional Requirement Specification (FRS) as adopted by NANC.

**12.2 BUSINESS & ARCHITECTURE REQUIREMENTS**

**12.2.1 LLC (Limited Liability Company)**

Each NPAC vendor has to be established under the Regional LLC. At a minimum, each respective Regional LLC has to keep its respective vendor in compliance with the Architecture requirements identified by NANC.

The sole purpose of the formation of a Limited Liability Corporation (LLC) is to create an entity to select and manage a neutral third party number portability administrator.

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Example activities of the LLC are the negotiation of the third party contract, prioritization of platform/software upgrades and on going direction of the third party's activities as described in the master contract. Membership of the LLC is not required for service providers to receive services from the neutral third party.

## **12.2.2 Competitively Neutral Pricing**

The NPAC vendors have to be competitively neutral in pricing. It is the responsibility of each respective Regional LLC to ensure that competitively neutral pricing is consistent with FCC and state regulatory mandates.

## **12.2.3 Competitive Neutral Service**

The NPAC vendor shall provide non-discriminatory level of service to all users.

## **12.2.4 NPAC User Criteria**

NPAC Users are required to be facilities-based<sup>9</sup> telecommunications Service Providers/Interexchange Carriers that have been certified or licensed by the appropriate regulatory body or bodies or are under contract to a facilities-based telecommunications Service Provider/Interexchange Carrier to provide billing, routing, and/or rating for that respective Service Provider or interexchange carrier. The above criteria limit NPAC access to those with an operational need for NPAC service in order to provide local number portability and to address public safety concerns. These limitations are necessary to protect security of information and to minimize NPAC costs.

## **12.3 NANC**

### **12.3.1 Architectural Change Approval Process**

All NPAC/SMS architecture changes will be approved by NANC and recommended to the FCC for final approval. Implementation of these changes will be managed via each respective Regional LLC with its respective NPAC vendor. If NANC is dissolved, an oversight body should be identified or established to support/approve NPAC/SMS architecture changes.

### **12.3.2 Conflict Resolution**

Any conflicts between Service Providers or LLCs in relation to NANC architecture will be escalated to NANC for conflict resolution.

## **12.4 LLC Merger Process**

The merging of Regional LLC's is not precluded.

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<sup>9</sup> The term facility based is used in this document to describe carriers who own or lease switching equipment.

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## **12.5 NPAC Business Roles and Responsibilities**

### **12.5.1 Neutral Third Party**

The NPAC will be staffed by a neutral third party vendor.

### **12.5.2 NPAC Role**

The primary role of the NPAC will be to assist users in obtaining access to the NPAC SMS. To perform this duty, the NPAC must support the following functional areas: administration, user support, and system support.

### **12.5.3 NPAC Administrative Functions**

1. The administrative functions of the NPAC will include all management tasks required to run the NPAC.
2. The NPAC will work with the users to update data tables required to route calls for ported local numbers or required for administration.
3. The NPAC will be responsible for NPAC SMS logon administration, user access, data security, user notifications, and management.
4. The NPAC will be the primary contact for users that encounter problems with NPAC system features.
5. The user support function should also provide the users with a central point of contact for reporting and resolution of NPAC problems.
6. The system support function will provide coordination/resolution of problems associated with system availability, communications and related capabilities.
7. The NPAC hours of operation will be 24 hours a day, seven days a week.
8. The NPACs must meet the service level requirements as established by their respective LLCs.
9. The NPAC will provide reports to regulatory bodies as required.

### **12.5.4 Transition Guidelines**

1. The NPAC will provide the same level of quality service during the period of transition to a new NPAC.
2. Transition to a new NPAC will be transparent to users.
3. Sufficient time will need to be established to allow each user to operate in a dual mode during transition to allow for installation of new NPAC links, testing of new NPAC links, problem resolution, installation at disaster recovery site, and de-installation of access links from old NPAC.

**13. REFERENCE DOCUMENTS**

- (1) Illinois Commerce Commission Order 96-0089 dated March 13, 1996.
- (2) FCC First Report and Order and Further Notice of Proposed Rulemaking: FCC 96-286: CC Docket 95-116. RM 8535: Adopted: June 27, 1996: Released: July 2, 1996.
- (3) FCC First Memorandum Opinion And Order On Reconsideration: CC Docket No. 95-116. RM-8935: Adopted: March 6, 1997: Released: March 11, 1997.
- (4) FCC Second Report And Order: CC Docket No. 95-116. RM 8535: Adopted: August 14, 1997: Released: August 18, 1997.
- (5) CTIA Report on Wireless Number Portability: Revision 1.0: April 11, 1997.

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**Attachment A**

**N-1 CALL SCENARIOS**

Refer to Paragraph 7.8 of the main document for the definition of N-1 carrier. Also refer to Section 8 of the main document for the local to local view of LNP call scenarios.

Refer to the figure on the last page of this attachment to help understand the call processing and routing described in the following call scenarios.

All Scenarios:

1. 816-724-2245 has changed service providers from LEC-1 to LEC-2.
2. NXX's 724 and 662 are considered ported NXX's.

**WIRELINE LONG DISTANCE CALLS**

**SCENARIO A1 (Long Distance - LNP/LRN Capable IXC):**

1. 507-863-2112 calls long distance to 816-724-2245 from outside the ported area.
2. LEC-3 routes the call to the caller's pre-subscribed carrier without any requirement to determine the LRN.
3. The pre-subscribed IXC (IXC-1) is the N-1 carrier. determines the LRN by performing a database dip. and routes the call to LEC-2. If IXC-1 does not have a direct connection to LEC-2, calls may be terminated through tandem agreement with LEC-1 *without change in the N-1 carrier responsibility.*

**SCENARIO A2 (Long Distance - IXC without LNP/LRN capability):**

1. 507-863-2112 calls long distance to 816-724-2245 from outside the ported area.
2. LEC-3 routes the call to the caller's pre-subscribed carrier without any requirement to determine the LRN.
3. The pre-subscribed IXC (IXC-2) is the N-1 carrier. Because IXC-2 does not have LNP/LRN capability, IXC-2 should have an agreement with LEC-1 (or LEC-2) to terminate default routed traffic, and LEC-1 (or LEC-2) becomes the carrier actually performing the LNP/LRN function to determine proper routing.

**WIRELINE LOCAL CALLS FROM OUTSIDE THE PORTED AREA**

**SCENARIO A3 (Local call outside ported area - LNP/LRN Capable LEC):**

1. 816-845-1221 makes a call within her local calling area, but from outside the ported area to 816-724-2245.
2. LEC-4 is the N-1 carrier and performs the database dip to determine the LRN and then routes the call to LEC-2. If no direct connection exists between LEC-4 and LEC-2, calls may be terminated through tandem agreement with LEC-1.

**SCENARIO A4 (Local call outside ported area - LEC without LNP/LRN capability):**

1. 816-845-1221 makes a call within her local calling area, but from outside the MSA and ported area to 816-724-2245.
2. LEC-4 is the N-1 carrier and at some time may be required to perform the database dip to determine the LRN to route the call to LEC-2. Until that time, LEC-4 should arrange with LEC-1 (or LEC-2) to terminate default routed calls.

**OTHER LOCAL CALLS**

**SCENARIO A5 (All calls originating from LEC-2 destined outside the ported area)**

1. LEC-2 has the responsibility to establish connection agreements to route all originating local calls from ported or non-ported subscribers served by LEC-2. LEC-2's local calling area in some states may be different than LEC-1's local calling area.
2. LEC-2 has the responsibility to establish connection agreements to route all long distance calls originated from ported or non-ported subscribers served by LEC-2.

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## **WIRELESS LONG DISTANCE CALLS**

### **SCENARIO A6 (Wireless long distance call outside ported area - Non-conforming IXC):**

1. Mobile user 816-234-7711 calls long distance to 816-724-2245 from inside or outside the MSA.
2. CMRS-1 is not obligated to determine the LRN and therefore routes the call to an IXC, typically via a tandem.
3. The Inter-exchange carrier (IXC-2) is the designated N-1 carrier, and has the responsibility to determine the LRN by performing a database dip and routing the call to LEC-2. However, because IXC-2 does not have LNP/LRN capability, IXC-2 should have an agreement with LEC-1 (or LEC-2) to terminate default routed traffic, and LEC-1 (or LEC-2) performs the actual N-1 function.

### **SCENARIO A7 (Wireless long distance call outside ported area - Conforming IXC):**

1. Mobile user 816-234-7711 calls long distance to 816-724-2245 from inside or outside the MSA.
2. CMRS-1 is not obligated to determine the LRN and therefore routes the call to an IXC, typically via a tandem.
3. The Inter-exchange carrier (IXC-1) is the designated N-1 carrier, and has the responsibility to determine the LRN by performing a database dip and routing the call to LEC-2. If IXC-1 does not have a direct connection to LEC-2, calls may be terminated through tandem agreement with LEC-1.

## **WIRELESS LOCAL CALLS**

### **SCENARIO A8 (Wireless local call outside ported area - Non-conforming CMRS):**

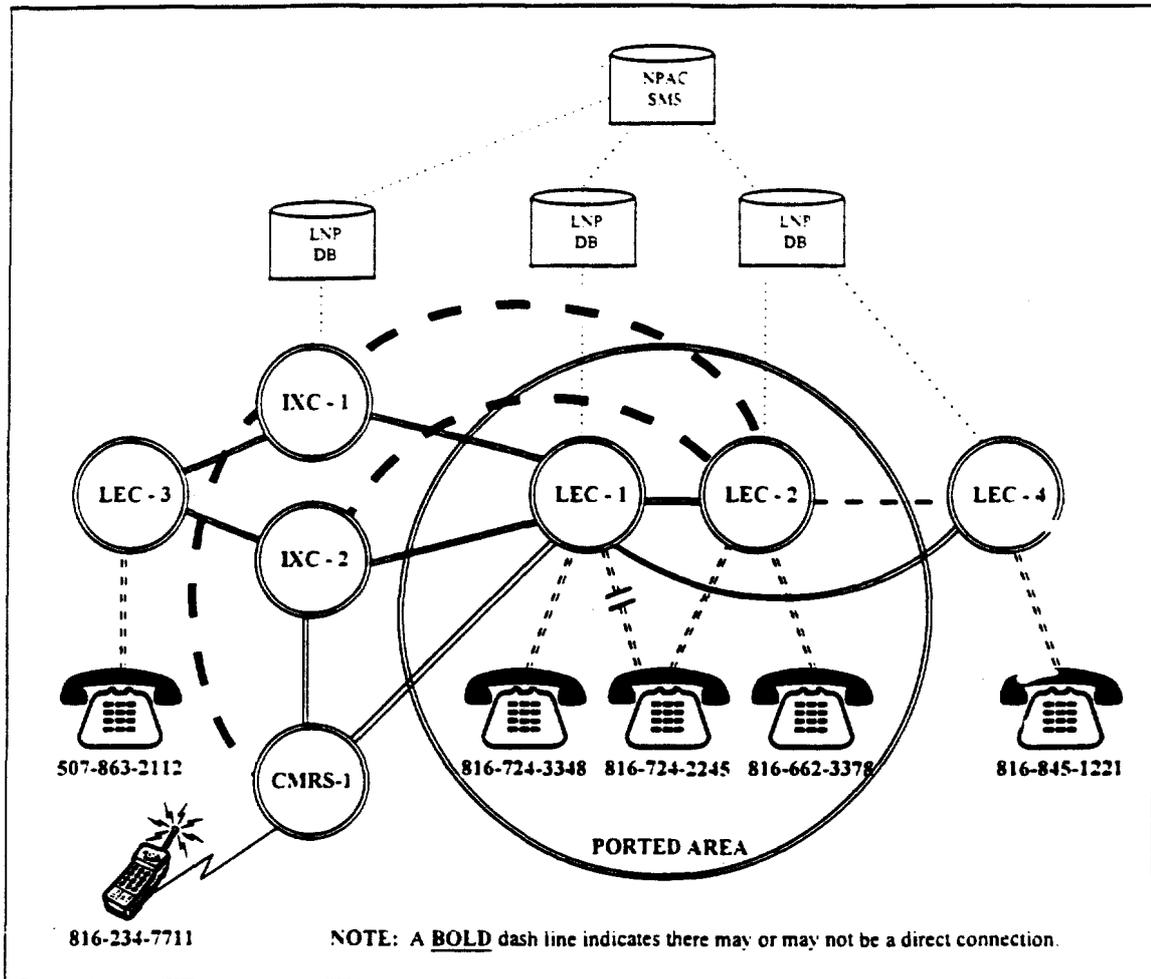
1. Mobile user 816-234-7711 makes a call within her local calling area, but from outside the MSA and the ported area to 816-724-2245.
2. CMRS-1 is the designated N-1 carrier. CMRS-1 should establish a business arrangement with LEC-1 (or LEC-2) to terminate default routed calls, and then LEC-1 (or LEC-2) performs the actual N-1 carrier function.

### **SCENARIO A9 Wireless local call outside ported area - Conforming CMRS):**

1. Mobile user 816-234-7711 makes a call within her local calling area, but from outside the MSA and the ported area to 816-724-2245.
2. CMRS-1 is the designated N-1 carrier and performs the database dip to determine the LRN and then routes the call to LEC-2. If no direct connection exists between CMRS-1 and LEC-2, calls may be terminated through a tandem agreement with LEC-1.

# NORTH AMERICAN NUMBERING COUNCIL LNP ARCHITECTURE & ADMINISTRATIVE PLAN

## Simplified Trunking and SS7 Diagram for Connections to Ported Area



**Figure A-1**

**North American Numbering Council**

*Local Number Portability Administration  
Working Group*

*2<sup>nd</sup> Report on Wireless Wireline Integration*

*February 5, 1999*

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## 1 Executive Summary

The LNPA Working Group (LNPA WG) has prepared the 2<sup>nd</sup> Report on Wireless Wireline Integration to address the open issues that were identified in the initial integration report submitted to the FCC on May 18, 1998.

In the First Report and Order, the Commission established rules mandating number portability for both LECs and CMRS providers. A separate timetable was established for CMRS providers, requiring them to implement Service Provider number portability by June 30, 1999. Subsequently the Wireless Telecommunications Bureau, acting on delegated authority, issued a Memorandum Opinion and Order (Order) granting a petition filed by the Cellular Telecommunications Industry Association (CTIA). The petition requested a nine-month stay of the requirement that all cellular, broadband personal communications service (PCS), and covered specialized mobile radio (SMR) carriers provide Service Provider number portability by June 30, 1999, changing the mandatory wireless implementation date to March 31, 2000.

### 1.1 Report Recommendations

This report continues to address the integration of wireline and covered CMRS provider number portability issues. The following list summarizes the recommendations made by the LNPA WG and its subcommittees. Please see the individual sections for a more detailed analysis of the issues.

1. **Inter-Service Provider LNP Operations Flows.** The Inter-Service Provider LNP Operations Flows have been modified to incorporate the LNP Operations of the wireless industry segment. *The LNPA Working Group recommends adoption of the modified flows (Figure 1 through 9) in place of those flows currently in use for LNP.*
2. **LSR/FOC Processing Interval.** To date, experience has shown that the LSR/FOC process between wireline Service Providers, requires *at least* the one-day interval, whether electronic or manual interfaces are employed. *Thus, the service providers participating in the analysis believe that it is not yet possible to shorten the LSR/FOC processing interval, and require that the 24-hour interval be applicable for all ports including ports to wireless providers.*
3. **The Study of Alternative Porting Intervals.** The expectation of new wireless customers is that they can leave a wireless point of sale with a functional handset. That is the ability, at a minimum, to make calls from their new handset. The wireless industry's customer acquisition and provisioning systems are all geared to meet this expectation with remote access network provisioning systems and Over the Air Activation. These systems can provide a functional service in one half hour, or less. To satisfy the current wireless business model and to meet customer expectations, wireless providers require shorter porting LSR/FOC process and porting intervals.

The LNPA Working Group recommends that the following alternatives be thoroughly developed and investigated in an effort to find mutually acceptable variations that may improve the porting interval in some circumstances. The Working Group further recommends that this analysis result in final recommendations on porting intervals provided by June 30, 1999

*Alternative 1:*

By negotiation between individual Service Providers, the potential exists to reduce the porting interval by allowing the new Service Provider to activate the port at the NPAC as soon as the 10-digit trigger<sup>1</sup> has been applied by the old Service Provider, if "mixed service"<sup>2</sup> from both the wireline and the wireless providers simultaneously is acceptable until the disconnect process can be completed.

*Alternative 2:*

It may be acceptable to perform the new SP NPAC activation of the port immediately following the receipt of the FOC by the new service provider and concurrence at the NPAC by the old SP, if "mixed service" from both the wireline and the wireless providers simultaneously is acceptable until the ten-digit trigger or the disconnect process can be completed.

*Alternative 3:*

If the Service Providers involved agree, it may be acceptable for the new Service Provider to perform the NPAC creation and activation of the port immediately following the receipt of the notification of the old SP create from the NPAC. If the old Service Provider is in agreement with the LSR, then the old SP indicates authorization to proceed with the port by issuing an old SP create with the authorization flag set to true. The new SP may rely on the NPAC notification in lieu of an FOC. This results in a "mixed service" situation from both the wireline and the wireless providers simultaneously until the disconnect process can be completed.

4. **Further Reduction of Porting Intervals** The Service Providers participating in this analysis believe that any other reduction in the porting process would require a fundamental redesign of the processes that support local number portability at each Service Provider. The feasibility of such a change would first require extensive investigation which would be both expensive and time-consuming, and *should not* be undertaken without exhausting all other possibilities, nor without the assurance of cost recovery.

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<sup>1</sup> The unconditional ten-digit trigger is an option assigned to a line on a donor switch during the transition period when the line is physically moved from donor switch to recipient switch. During this period it is possible for the TN/MDN to reside in both donor and recipient switches at the same time.

<sup>2</sup> Mixed service refers to the period between NPAC activation by the wireless provider and the disconnect of the wireline service, during which the ability to originate and/or terminate calls from either the wireline or wireless device exists.

5. **Integrated LSR Forms.** The LNPA Working Group, as a result of the efforts of the CTIA Inter-Service Provider Sub-committee, and subsequently the WWISC, recommends an integration of wireless requirements into the existing wireline LSR process. Relevant data elements that could be populated within the four LSR forms, by wireless Service Providers for all port scenarios, have been identified.

6. **Operational Issues.**

*a) Holidays*

The LNPA Working Group recommends the following Holidays be observed in the NPAC/SMS:

- New Years Day, Jan 1
- Martin Luther King Day, Third Monday in January
- President's Day, Third Monday in February
- Memorial Day, Last Monday in May
- Independence Day, July 4<sup>th</sup>
- Labor Day, First Monday in September
- Columbus Day, Second Monday in October
- Thanksgiving Day (US), Last Thursday in November
- Day after Thanksgiving (US), Day after Thanksgiving
- Christmas Eve, December 24<sup>th</sup>
- Christmas Day, December 25<sup>th</sup>

*b) Business Days and Hours of Operation*

Wireless Number Portability will include new hours of operations for wireless carriers to reflect their business model and incorporate the hours of their retail operations. The LNPA Working Group recommends adoption of these business hours for wireless LNP operations (with local time to be determined by region).

	<b>Wireline</b>	<b>Wireless</b>
Sunday		
Monday	7AM TO 7PM CT	8 or 9 am 12 hr duration
Tuesday	7AM TO 7PM CT	8 or 9 am 12 hr duration
Wednesday	7AM TO 7PM CT	8 or 9 am 12 hr duration
Thursday	7AM TO 7PM CT	8 or 9 am 12 hr duration
Friday	7AM TO 7PM CT	8 or 9 am 12 hr duration
Saturday		8 or 9 am 12 hr duration

7. **Coordination of Complex Ports.** The LNPA Working Group recommends that guidelines for identification and coordination of Complex Ports as defined in Section 5 of this report be adopted for use by the industry when circumstances warrant.
8. **Treatment of Type 1 Numbers.** Agreement was reached on the treatment of Type 1 NPA-NXXs. Wireless carriers may request that the wireline switch and NPA NXX code is number portability capable. Wireless carriers may port the assigned and reserved Type 1 numbers to their MSC. The wireless carrier then may terminate their old Type 1 interconnection contract with the ILEC.

## **1.2 E911 Process Considerations**

The FCC Report and Order 96-264 (also commonly known as FCC Docket 94-102) mandates the delivery of a wireless 9-1-1 caller's callback and location information to the Public Safety Answering Point (PSAP). Because implementation of number portability affects the routing of a call from emergency services to the callback number, wireless Service Providers need to be aware of the interaction of 911 service and number porting. See Section 5.3 for examples of situations that may occur.

## **1.3 Contents of the Report**

The Introduction in Section 2 discusses the purpose of the 2nd Report on Wireless Wireline Integration.

Section 3 provides information on porting intervals when porting from wireline to wireless carriers and provides a workplan for developing porting procedures when porting from wireline to wireless.

Section 4 discusses Operational issues including Holidays, Business Days and Hours of Operation, NPAC Timers, and wireless integration of the LSR/FOC process.

Section 5 contains other integration issues that were identified and discussed at the LNPA WG and recommendations to the industry. This section includes a discussion of coordination of Complex Ports, treatment of Type 1 numbers, 911 issues, and first port.

Section 6 identifies open issues that are still under analysis.

Section 7 contains definitions of the terms used in the report.

Appendix A contains a list of the LNPA Working Members.

Appendix B contains the LNPA Working Group and Task Force meeting schedule.

Appendix C contains the revised, integrated Inter-Service Provider LNP Operations Flows and their narrative descriptions.