



**Comments on Telecom Regulatory Authority of India's
Consultation Paper No. 7/2005
On
Mobile Number Portability**

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Glossary

ABS	alternate billing services	The group of subscriber telephone services including calling card, third-party billing, and collect billing services stored in the Line Information Database (LIDB)
AC	access customer	Telephone company responsible for traffic between LATAs. i.e. long distance company.
ACK	acknowledgement (message type)	
ACTL	access carrier terminal location	
ALI	automatic location information	The supplemental information contained in a PSAP database that describes a caller's location, indicates hazardous materials, and so on.
AP	access provider	Telephone company responsible for traffic originating and terminating within jurisdictional areas as defined by regulatory agencies. i.e. local company
BSA	basic serving arrangement	
BTN	billing telephone number	The BOCs and ITC have traditionally identified customer accounts with account numbers based on one of the ten-digit telephone numbers on the account. The telephone number used as the account number is called the Billing Telephone Number. Other telephone number on the account are referred to as Working Telephone Numbers.
CCNA	customer carrier name abbreviation	
CENTREX	central office exchange service	A type of PBX service in which switching occurs at a local telephone station instead of at the company premise.
CIC	carrier identification code	
CLASS	customer local area signal service	
Clearinghouse		An independent company providing communication and data processing services to CLECs. It primarily stores information about telephone service of CLEC customers. Also known as a trading partner.
CLEC	competitive local exchange carrier	The new group of deregulated telecommunications providers that compete on a selective basis to provide services.
CLLI	common location language identifier	
CNAM	calling name	The type of information exchanged in DSET's ezCallerID. The name and telephone number of the originating party is displayed on a Caller ID device at the destination subscriber's telephone
CO	central office (telephone)	The location, which houses a switch to serve local telephone subscribers.
COS	class of service	
DPC	destination point code	
EB	electronic bonding	The telecommunications industry is now divided over multiple jurisdictions of customers and suppliers. Each jurisdiction contains an interface through which its service management programs communicate to other jurisdictions, a process commonly referred to as EB. The interface is the Service Management Layer (SML) X interface, as defined in the Telecommunications Management Network (TMN) architecture.
ECIC	Electronic Communications Implementation Committee	A subcommittee of TCIF and ATIS, whose mission is to identify and resolve common technical and operational issues to successfully implement electronic bonding. ECIC focuses on implementing application-to-application communications for operations, administration, maintenance, and provisioning (OAM&P) functions. It identifies additional functionalities for standardization and champions development with the appropriate standards groups.
EDI	electronic data interchange	
ESN	emergency service number	A list of emergency numbers of corresponding police, fire, and ambulance dispatch centers for a caller's 911 area.

FCC	Federal Communications Commission	
FX	foreign exchange	A central office trunk that has access to a distant central office.
FYI	for your information	Messages concerning end-user account changes that a CLEC must send to an IXC to ensure correct billing and service.
gateway		A device or software that connects two computer networks that use different protocols, translating between the protocols so that computer on the connected networks can exchange data
GNP	geographic number portability	Enables customers to retain telephone number when served by same service provider, but from different local switch in the same city code.
GTT	global title translation	A service provided by the SCCP layer whereby a global title address is translated into an SS7 address (point code + subsystem number) for message routing purposes.
ICSC	interexchange carrier service center	
ILEC	incumbent local exchange carrier	A traditional, previous incumbent local exchange carrier that was never part of the Bell System.
ILP	intraLATA presubscribed carrier	Local long distance carrier information.
IntraLATA	Local long distance telephone service area.	
ISDN	integrated service digital network	The most common ISDN system provides one data and two voice circuits over a traditional copper wire pair, but can represent as many as 30 channels. Broadband ISDN extends the ISDN capabilities to service in the gigabit range.
ISVM	inter-switch voice messaging	A database for audits
ITC	independent telephone company.	Also referred to as incumbent telephone company.
ITU	International Telecommunication Union	
IXC	interexchange carrier	Same as PIC
LATA	local access and transport area	Contiguous geographic area defined by a Bell operating company around a metropolitan statistical area so that in most cases, all points are within only one exchange area and state.
LEC	local exchange carrier	A company providing local telecommunications transmission and switching services. Originally this term referred to either a BOC or an ITC such as GTE or Alltel. These companies are now called ILECs to distinguish them from CLECs.
LIDB	line information database	The type of information exchanged in DSET's ezCallingCard. A database developed by the Regional Bell Operating Companies and local phone companies that will include such services as Originating Line number screening (OLNS), Calling Card Validation, Billing Number screening, Calling Card Fraud, and Public Telephone Check. A database that contains information to perform billing validation.
LISP	local intra-service portability	
LNP	local number portability	Permits both ILECs and CLECs to allow customers to take their telephone numbers with them when they exchange carriers in the same geographical region.
LPIC	local presubscribed interexchange carrier	LPIC is a FID that indicates the pre-programmed choice of Equal Access (1+) long distance carrier.
LRN	location routing number	
LSCNB	LIDB specific call number blocking	
LSMS	Local Service Management System	An interface to a service provider's network responsible for receiving data from the Customer Care System and propagating the data to the network elements STP C.
LSOA	LNP service order administration	
LSOG	Local Service Ordering Guidelines	Set of standards that define how CLECs will define service orders used to provision their customers.

LSPP	local service provider portability, inter-service provider porting	
LSR	local service request, ezLocal product name	Have many uses: type of service, name of a form, and a document type.
MBN	main billing number	Also known as Billing Telephone Number (BTN)
MIB	management information base	A database of management information
MSAG	Master Street Address Guide	
NANC	North American Numbering Council	standards body for porting telephone numbers
NE	Network Element	
NENA	National Emergency Number Administration	
network data		the location routing number (LRN) and NPA-NXXX required for call routing databases residing throughout the U.S. which facilitate call routing
network element	(see STP and SCP)	
NP	number portability	<i>See</i> number portability
NPA	number plan area	An area code of a ten-digit telephone number. <i>See also</i> NXX
NPAC	Number Portability Administration Center	Regional centers developed to interact with the Local Service Order Administration (LSOA) systems of all carriers in order to transfer the customer's telephone number from a legacy Local Exchange Carrier (LEC) to a new LEC.
NPB	<i>See</i> Number Pool Block	
NSL	number of secondary lines	
number pool block		A block of 1,000 consecutive telephone numbers allocated to one service provider out of an NPA-NXX.
number portability		Enables customers to keep their original telephone number when they change exchange carriers.
NXX		The first three digits of a station number (in the format of the NPA-NXX-Line Number) that identifies the central office, which serves that number. <i>See also</i> NPA
NXX-X		A block of 1,000 consecutive telephone numbers, consisting of the exchange (NXX), and the first digit of the thousand-block.
OAM&P	operations, administration, maintenance, and provisioning	
OBF	Order and Billing Forum	An organization of the Carrier Liaison Committee (CLC) of the Alliance for Telecommunications Industry Solutions (ATIS) providing a forum for customers and providers in the telecommunications industry to identify, discuss, and resolve national issues which affect ordering, billing, provisioning, and exchanging information about access services, etc.
OCN	operating computer number	A valid operating company number that's required for portable exchanges.
OLNS	originating line number screening	Calling restrictions such as displaying caller identification and phone number on an originating line.
OPX	off-premises extension	An extension or phone terminating in a location other than the location of the PBX. For example, a company executive has an extension installed at their home.
OSS	operational support system	The hardware and software that supports the daily operations of a telecommunications service provider. Typical tasks performed by the OSS include managing the network, provisioning, configurations, alarms, performances, and accounts. Methods and procedures that directly support the daily operation of the telecommunications infrastructure. The average Local Exchange Carrier has hundreds of systems supporting order negotiation, order processing, line assignment, line testing, and billing.
PBX	private branch exchange	A small version of the phone company's larger central switching office that a customer can own.

PIC	presubscribed (or primary) interexchange carrier	PIC is a FID that indicates the programmed choice of Equal Access (1+) long distance carrier for Inter-LATA traffic. The interexchange carrier designated by the subscriber provides the interLATA service automatically when the customer dials 1 + the 10 digit telephone number. In an equal access office, the subscriber can choose another carrier by dialing a 950-xxxx or 10-10xxx number.
POTS	plain old telephone service	Describes any simple switched telecommunications service. The term POTS includes both residential and business lines, but excludes complex services such as trunks or circuits.
PSAP	In ez911: public safety answering point.	One or more offices that (1) receives a 911 call, (2) verifies or obtains the caller's location, (3) determines nature of the emergency, and (4) dispatches the appropriate emergency response team.
PUC	Public Utility Commission	
RAO	Revenue Accounting Office	
RBOC	Regional Bell Operating Company	
RHBC	Regional Bell Holding Company	
RN	routing number	Used by the STP C to perform the Global Title Translation to obtain the Point Code/SubSystem Number for the desired HLR. For IMSI based ALR routing, this is equivalent to the MSISDN number and identifies the subscriber.
SC	service center	<i>See</i> service center.
schema		Refers to a particular set of database tables.
SCNB	specific call number blocking	Telephone service that gives subscribers the ability to block calls for specific number or sets of numbers.
SCP	service control point	A remote database within the System Signaling 7 network, which supplies the translation and routing data needed to deliver, advanced network services.
service center		The name for the communications portal of a trading partner for DSET gateway products. The service center receives communications from CLECs and passes them on for processing and response generation. In some gateways, the service center also transmits communications back to CLECs after processing.
service provider		The individual or business entity that sells, operates, and maintains the messaging functions for the public. The system operator sells or leases time and resources to this entity.
SI	status indicator	A two-digit numeric code unique to each telephone company transaction code (TC) providing specific details associated with the transaction code.
SMS	service management system	An SS7 operations support system (OSS) used to help provisioning and loading data into the service control point (SCP) database.
SOA	service order administration	
SOAC	Service Order Administration Center	
SP	service provider	A network operator to which subscribers are connected. <i>See also:</i> Service Provider
SS7	Signaling System 7	A network provider who furnishes a standard interface and protocol for all CLECs, hiding the detail to access the individual Line Information Databases.
SSN	subsystem number	
STP / STP C	signal transfer point	signal transfer point C7
SV	subscription version	A time or status-sensitive instance of subscription data required to provide telephone service.
T1		Standard for digital transmission in the US, Canada, Hong Kong, and Japan
TC	transaction code	A two-digit numeric code defined for telephone company transactions that are transmitted electronically to other telephone companies. Transaction codes and status indicators (SIs) allow transmission of multiple types of records on the same files. Transaction codes describe the nature or purpose of the data being exchanged.

TCAP	transaction capabilities application part	The subprotocol of SS7 that is used for messages between end offices and remote databases (non-circuit information between signaling points.)
TELCO	The name of a telephone company	
TMN	telecommunications management network	A set of standards published by the International Telecommunications Union (ITU) and used worldwide by telecommunication service providers (carriers) and hardware manufacturers to identify, manage, and control information, management systems, and equipment elements in a telecommunications network.
TN	telephone number	
TP	trading partner	<i>See trading partner</i>
TPI	trading partner interface	
trading partner		An independent company providing communication and data processing services to CLECs. They primarily store information about telephone service for CLEC customers. In ez911, they are also known as a clearinghouse. Trading partners can be service providers and/or entities with which a service provider has an agreement.
TSP	Telecommunications Service Priority	
USOC	universal service order code	A set of codes developed by the Bell System and used by local telephone companies as a standard means of identifying service or equipment for billing purposes. USOCs are located in the Service and Equipment (S& E) section of the CSR. They are three character codes with an optional suffix of up to two characters, for a possible five characters. They may be any combination of letters and numbers.
WSMSC wireless short message service center		
X.25		A data communications interface specification from the Consultative Committee for International Telephone and Telegraph (CCITT) describing how data passes into and out of public data networks. The protocol suite defines layers one through three. X.25 is the CCITT and OSI standard for packet-switching networks that provide channels up to 64Kbps. Public and private X.25 networks can be built. In the US, common X.25 networks are British Telecom, AT&T, CompuServe and Infonet.

An Introduction to NE Technologies

As a sister concern to DSET Corporation, 520 Guthridge Court, Norcross, GA 30092, USA, we would like to state that we have more than eight years of experience with Local Number Portability in the North American continent. We have worked extensively in the design, development, and support of the Number Portability Administration Center in USA.

DSET was selected to define and administer LNP test center. This was the only commercially available facility for testing and certifying service providers and vendors to interface with or utilize NPAC Service Management Systems.

DSET was one of the pioneers in defining:

- LNP Functional Requirements Specification in 1997/1998
- NPAC IIS (GDMO Model) in 1998

DSET is a dominant supplier of International Telecommunications Unions/Telecommunications Management Networks (ASN/GDMO) development and interface tools that are used by several leading equipment manufacturers and leading software vendors. Our products like LSOA (LNP Service Order Administration) are dominant in USA in LNP application.

No wonder that the NPAC SMS systems are based on the DSET TMN Toolkit.

1. What is the anticipated impact of number portability on customer satisfaction and increased competition between services and operators?

Number portability is a circuit-switch telecommunications network feature that enables end users to retain their telephone numbers when changing service providers, service types, and/or locations. When fully implemented nationwide by both wireline and wireless providers, portability will remove one of the most significant deterrents to changing service, providing unprecedented convenience for consumers, and encouraging unrestrained competition in the telecommunications industry.

When the Federal Communications Commission mandated Local Number Portability in 1997 (fallout of the Telecommunications Act of 1996 TA-96), the impact on the ordinary citizen was minimal. Points of concern that were raised then included:

- Confusion over the meaning of number portability – whether it applied to service provider porting, location (geographical) porting or services porting or all or a combination
- Billing charges for ported numbers
- Whether local number porting applied to wireless numbers also

At a national level, there were other, higher priority concerns; few of which were:

- The Telecommunications Industry in North America was running out of NPAs as more and more telephone lines were consumed leading to NPA-NXX area splits.
- Number resources were dwindling per rate area
- By 2003, FCC had also mandated that all wireless service providers should offer local number portability. This mandate allowed for wireless-wireless, wireless-wireline and wireline-wireless porting.

Using this history, it is not difficult to predict the impact of LNP:

Customer satisfaction is based on his/her expectations. The following will be frequent issues for discussion:

- Information on current LNP availability/non-availability services
- Information on limitations of LNP being offered
 - whether the donor switch supports LNP
 - whether the new recipient switch supports all existing features on the line
- Time frames for porting a number successfully
- FAQs such as “How do I return back to my earlier service provider”
- Billing charges and LNP recovery costs

A negative impact on Customer satisfaction can be reduced by:

- Preparing Customers for a service provider porting environment
- Providing correct information on current services being offered
- Seamless transition between service providers

- Better inter-company co-operation
- On time billing, correct billing and charges (if applicable)
- Make sure that all services work properly

Positive impacts of LNP on Customer satisfaction are:

- The ability to retain his/her number when switching to another service provider
- Ability to port his/her number without impairment of quality, reliability, or convenience
- Reducing the costs for re-printing official stationary etc.
- Reducing the risk of lost business opportunities due missed calls
- To foster competition and receive better quality services

There is much scope for service providers (operators) to better compete and meet Customer expectations if LNP is introduced. The playing field is leveled. Several business opportunities arise from LNP:

- Customers, inadvertently calling the wrong carrier will provide opportunities
- Customer calling another carrier establishes recognition and communication
- Competing service provider has an opportunity to win over Customers
- Competing service provider has an opportunity to educate Customers

There are other issues that have not been discussed but need to be – how will law enforcement agencies track or trace ported numbers?

2. The following technical options have been discussed in the consultation paper. Please indicate your preference with reasons:

- a. All-Call-Query**
- b. Query-On-Release**
- c. Onward Routing (Call Forwarding)**
- d. Call-Drop-Back**
- e. Any other solution**

Please note that establishing performance criteria that any number portability architecture must meet would better serve the public interest than choosing a particular technology or specific architecture.

Before discussing technical options on the LNP method to be implemented, it is necessary to discuss the state of technology, as it exists today in India. Please refer to Item No. 8.

The next two sections provide more technical information on number portability options.

A. Non-database methods

The most common two methods of providing service provider number portability that do not use databases are Remote Call Forwarding and Flexible Direct Inward Dialing. These methods are commonly referred to as "interim measures." While most service providers or carriers can port numbers to other service providers by using these methods, they suffer from certain limitations that make them unsuitable for long-term number portability. RCF redirects calls to telephone numbers that have been transferred by essentially placing a second telephone call to the new network location. DID routes the second call over a dedicated facility to the new service provider's switch, instead of translating the dialed number to a new number.

B. Database methods

There are several methods for providing service provider portability using databases containing the customer routing information necessary to route telephone calls to the proper terminating locations. All these methods depend on Intelligent Network (IN) or Advanced Intelligent Network (AIN) capabilities. One such solution is LRN. Essentially, Location Routing Number (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. The carrier then would route the call to the new carrier based on the location routing number.

Another method is the Carrier Portability Code (CPC) method. This method operates in a similar manner to LRN. Under CPC, however, the database associates the dialed telephone number with a 3-digit carrier portability code identifying the particular carrier to whom the dialed number has been transferred, rather than a particular switch.

Another proposed solution is GTE's Non-Geographic Number (NGN) method. While this method uses a database, it operates in a fundamentally different manner from CPC and LRN. The NGN method would provide service provider and location portability to end users by assigning them non-geographic telephone numbers, such as an INPA (interchangeable numbering plan area) code that has been assigned for non-geographic numbers. Telephone calls to such end users would be routed in much the same way as toll free calls are today, by performing a database query to determine the geographic telephone number corresponding to the dialed non-geographic telephone number, and routing the call to the appropriate geographic number.

Another proposal is to have a triggering mechanism, which operates in conjunction with the same addressing scheme utilized in the LRN method. This mechanism, called Query on Release (QOR) or Look Ahead, determines under what circumstances a database query is performed. Under QOR, the signaling used to set up a telephone call is routed to the end office switch to which the dialed telephone number was originally assigned (the release switch).

Another number portability method triggering mechanism that is similar to QOR is Release-to-Pivot (RTP). RTP differs from QOR in that when a number has been ported from the release switch, the release switch -- rather than the previous switch in the call path -- returns the address information necessary for routing the call. The information regarding where to route the telephone call, if the number has been transferred, may be contained either in the release switch or an external database.

The following are our comments and observations on the various options available for LNP in India.

An All-Call-Query will accomplish the following provided it has an IN/AIN signaling system and a STP/SCP database:

- It is a IN or AIN based ported number query and the switch contains at least one ported number
- The switch will send the number over the IN/AIN signaling system to the STP/SCP
- The STP/SCP will send back a correct routing number for the call
- THIS IS THE PREFERRED LONG TERM SOLUTION.

A Query-On-Release:

- This is a IN or AIN based ported number query
- We would like to ignore this option as it would involve the most number of call routing back-and-forth messages as number ports increase
- This option is a service provider or carrier dependent option and may not be accepted by all.

Call Forwarding:

- This is a switch-based option. Probably, most suited for India.
- Call routing information readily available in the switch's database
- No extra SCP or AIN database requirements
- The originating switch ("1") will provide the routing number for the call.
- The cons are inefficient usage of routing data, will fail for multiple ports of the same number and may fail for complex routing involving many switches. Applies for wire-line porting.
- THIS IS THE PREFERRED SHORT TERM SOLUTION.

Call Dropback:

- This is a switch-based option.
- Not suitable because of more network usage and additional costs
- The original service provider or owner of the number will provide the routing number for the call to the new service provider.

3. In the past, some countries have followed the approach of implementation of a short-term solution, with parallel planning for a long-term solution. Several other countries have opted directly for a long-term solution. The issues associated with either approach are discussed in this paper. Please give your opinion, with reasons, on the path India should adopt.

As a preferred vendor of the Telecommunications Industry, in providing Local Number Portability application software, NE Technologies strongly believes in adopting a long-term solution. We believe so for many reasons:

- Establishment of criteria for long-term number portability methods will ensure some level of uniformity countrywide.
- Deployment of a uniform number portability architecture nationwide will be important to the efficient functioning of the public switched telephone network
- Maintaining flexibility to accommodate innovation and improvement.
- A uniform deployment will allow switch manufacturers to work toward a single standard, thus avoiding the situation where different manufacturers offer different methods adding to the complexity of maintaining such standards.
- Reduce the costs of implementing number portability nationwide by allowing switch vendors to spread the costs of development over more customers.
- Provides for enough time for service providers, carriers and other agencies and official committees to plan and strategize a mature LNP solution

Any long-term number portability method must support the following:

1. Support existing network services, features, and capabilities;
2. Efficiently use numbering resources;
3. Not require end users to change their telephone numbers;
4. Not require service providers or carriers to rely on databases, or network facilities, or services provided by other telecommunication service providers or carriers in order to route calls to the proper termination point;
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 any service provider or carrier having a proprietary interest;
8. Be able to accommodate location and service portability in the future;
9. Have no significant adverse impact outside the areas where number portability is deployed.

First, let us examine what needs to be done in planning, design and implementing a MNP (and LNP):

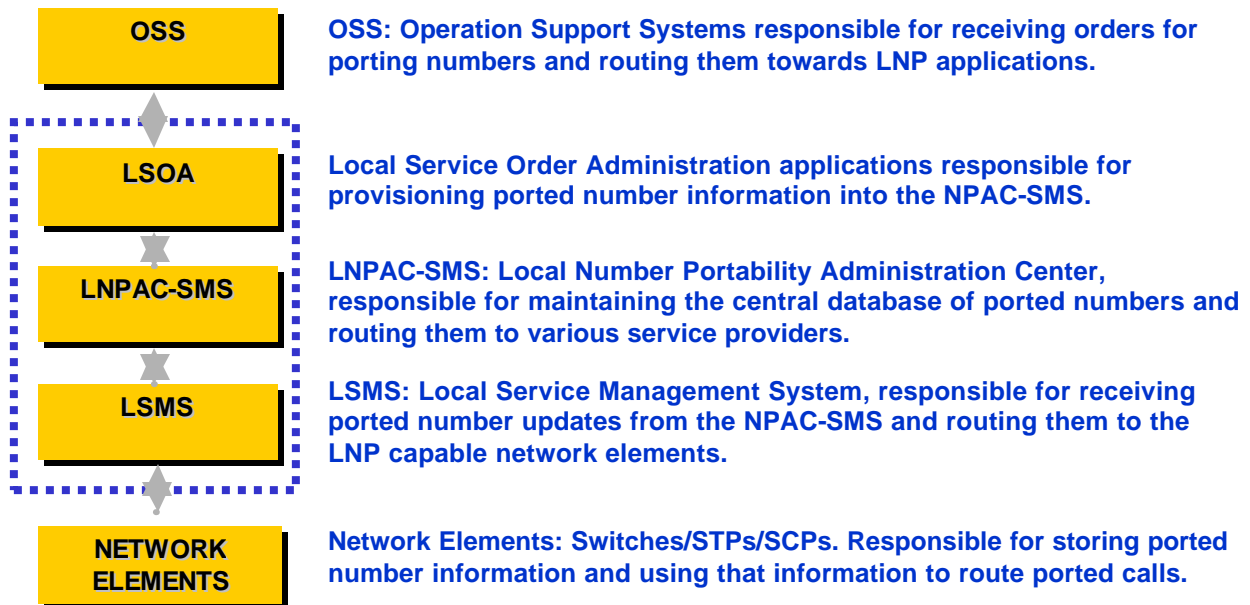
For TRAI:

1. Lay out a clear policy on Local Number Porting, outlining project plans
 - a. Consult and discuss impact on Service Providers or Carriers
 - b. Consult and discuss impact on Switch/Exchange manufacturers
 - c. Consult and discuss impact on Rural areas and small Exchanges
2. Set Milestones and mandate dates for implementation by service providers
 - a. Switches in rural areas,
 - b. small exchanges
 - c. areas where there are is only one service provider or carrier may be exempt from LNP initially
3. Lay out clear plans for recovery of costs arising due Number Porting costs
4. Regulate service provider or carrier charges to end Customers
5. Prepare for a National Number Planning commission or sub-committee
 - a. To study and make recommendations for a revamping of the telephone numbering system (if required)
 - b. To regulate and mandate a Location Routing Number based database for switches of 10,000 lines and higher capacity. (Each switch needs to be identified by a unique LRN).
6. Solicit consulting papers on National Number Portability Administration
 - a. To provide for a third party independent and neutral Number Portability Administration Center that will create and maintain a national repository of ported numbers. This Center will also be responsible for notifying all service providers and carriers
7. Prepare for a National Common Channel Signaling commission or sub-committee

For Service Providers

1. Submit recommendations to TRAI
2. Upgrade existing switches and exchanges to handle number porting
3. Upgrade existing signaling in accordance to the guidelines set by National Common Channel Signaling body

A Typical LNP Business Model



4. In case of a centralized database approach, who should be responsible for the setup, ownership, administration, and management of such a database? Should the administration and operation of a centralized database be assigned to a third party duly licensed by the licensor as an other service provider (OSP) on the lines of a clearing-house, or should some other approach be adopted?

To ensure standardization across platforms for all participants, the FCC instructed the North American Numbering Council (NANC) to determine which number portability method to employ. Several options were investigated. The location routing number (LRN) method was chosen because it appeared to be the most efficient and is now successfully implemented in the wireline environment. The NANC then created the Local Number Portability Working Group (LNP-WG) and empowered it to select the appropriate technology, create standards, determine operational processes, and develop and implement a deployment strategy. To fulfill its responsibilities, the LNP-WG was granted the authority to convene appropriate subcommittees as needed. Subcommittees created include the National Number Pooling group, as well as the Wireless Number Portability subcommittee, which defines integration issues between the wireless and the wireline industries. NeuStar was named the Number Portability Administrator and operates the Number Portability Administration Center (NPAC) under the supervision of NANC.

The following discussions were the basis for FCC to establish a third-party administrator for local number portability:

- It is in the public interest for the number portability databases to be administered by one or more neutral third parties.
- Neutral third party administration of the databases containing carrier routing information will facilitate entry into the communications marketplace by making numbering resources available to new service providers on an efficient basis.
- It will also facilitate the ability of local service providers to transfer new customers by ensuring open and efficient access for purposes of updating customer records.
- The ability to transfer customers from one carrier to another, which includes access to the data necessary to perform that transfer, is important to entities that wish to compete in the local telecommunications market.
- Neutral third party administration of the carrier routing information also ensures the equal treatment of all carriers and avoids any appearance of impropriety or anti-competitive conduct.
- Such administration facilitates consumers' access to the public switched network by preventing any one carrier from interfering with interconnection to the database(s) or the processing of routing and customer information.
- Neutral third party administration would thus ensure consistency of the data and interoperability of number portability facilities, thereby minimizing any anti-competitive impacts.

We recommend a similar approach to be followed in India :

- Setting up of a national Number Planning sub-committee or council.
- Setting up of a Local Number Portability Administration Center with a centralized database that all service providers subscribe to and is under the direct supervision of TRAI
- LNPAC will be responsible for setup, ownership, administration, and management of such a database.

- The database belongs to LNPAC and TRAI.
- The LNPAC is responsible for implementing TRAI policies and decisions.

The following can be the charter of the National Numbering Planning sub-committee:

- The fundamental purpose of the National Number Planning sub-committee is to act as an oversight committee with the technical and operational expertise to advise the TRAI on numbering issues.
- The National Number Planning sub-committee shall select a LNPA (Local Number Portability Administrator) to ensure consistency and to provide a national perspective on number portability issues, as well as to reduce the costs of implementing a national number portability plan.
- The National Number Planning sub-committee shall also setup a LNP-WG (Local Number Portability – Working Group) as a sub-committee to address issues arising out of number portability and will serve as advisors to NNP and TRAI.

National Number Planning sub-committee will determine

- Whether one or multiple administrators should be selected,
- How the LNPA(s) should be selected
- The specific duties of the LNPA(s)
- The geographic coverage of the regional databases

National Number Planning sub-committee will also determine the:

- Technical interoperability and operational standards,
- User interface between telecommunications carriers and the LNPA(s),
- Network interface between the SMS and the downstream databases.
- Technical specifications for the regional databases,

TRAI should invoke its statutory authority to recover its costs for regulating numbering activities, including costs incurred from the establishment, oversight of, and participation in the NNP/LNPA organizations.

5. How should the database updates between different operators be synchronized? Where could the central database be located?

6. What should be the level of centralization (metro, circle, national) for a centralized database? Should this be a permanent arrangement, or be subject to later revision?

TRAI with the help of the National Number Planning committee and Local Number Porting Administrator should establish the following requirements:

- Governing the provision of number portability without specifically addressing the appropriate database architecture necessary for long-term number portability.
- That an architecture that uses regionally-deployed databases best serves the public interest
- The deployment of multiple regional databases will facilitate the ability of service providers or carriers to provide number portability by reducing the distance such carriers will have to transmit carrier routing information. This, in turn, should reduce the costs of routing telephone calls based on such data.
- Moreover, a nationwide system of regional databases would relieve individual carriers of the burden of deploying multiple number portability databases over various geographic areas.
- A regionally-deployed database system will ensure that carriers have the number portability routing information necessary to route telephone calls between carriers' networks, and will also promote uniformity in the provision of such number portability data.
- That one national number portability database may not be sufficient and therefore is not feasible. The potential amount of information that one such single database would be required to process would likely become overwhelming as number portability is deployed nationwide.

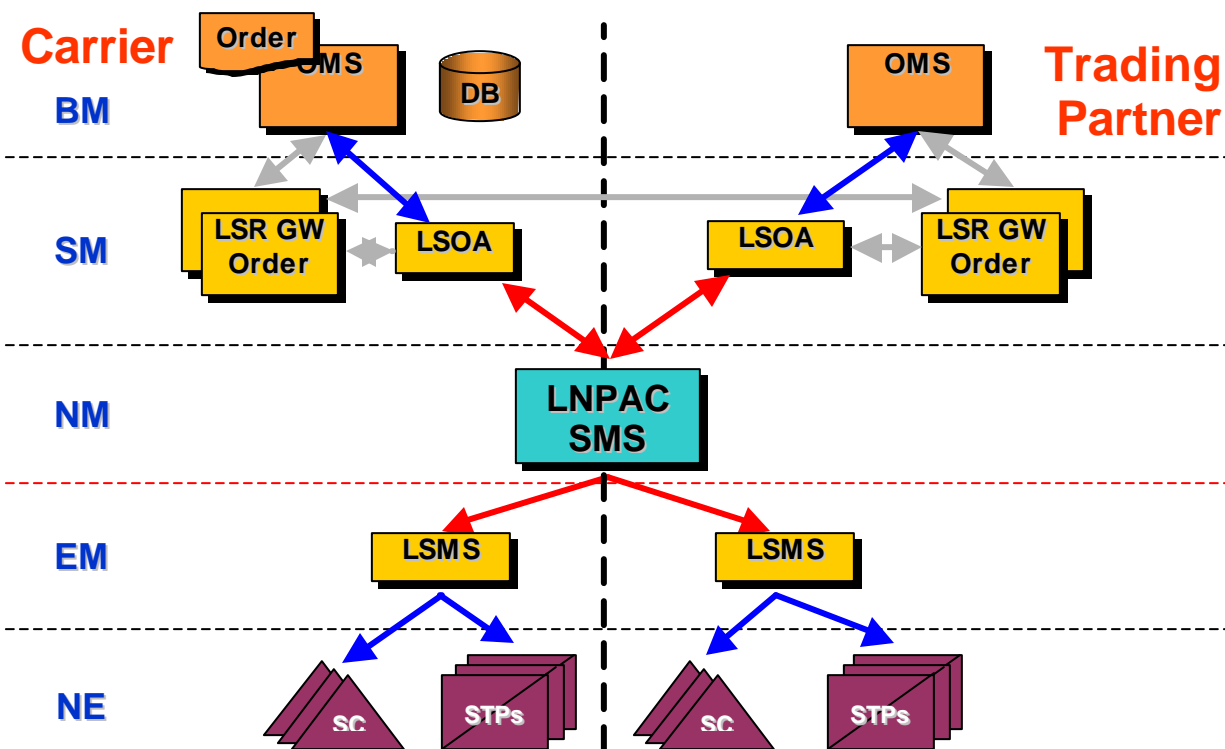
The central database (and backup database) will be located where all service providers agree that the site would be the fastest one for establishing and maintaining links to the LNPAC database.

One of the charters of the Local Number Portability Administrator and the Local Number Portability – Working Group would be to:

- Plan and recommend regional databases, location of databases and connection facilities
- Design and develop Functional Requirement Specifications for the proposed LNPAC Service Management System including information model, data encoding and abstraction model, data schemas and transmission protocols etc.
- Design and develop Inter-Operability Interface Specifications between LNPAC Service Management System and other software vendors Number Port Service Order Administration and Local Service Management Systems
- Design, develop and setup the various Test Plans & Suites associated with LNP such as TUT (Turn Up Testing), ITP (Interoperability Testing) and Group Testing
- Establish systems and processes for:
 - Receiving number ports from service providers or carriers (Number Port Service Order Administration)
 - Updating internal LNPAC-SMS databases;

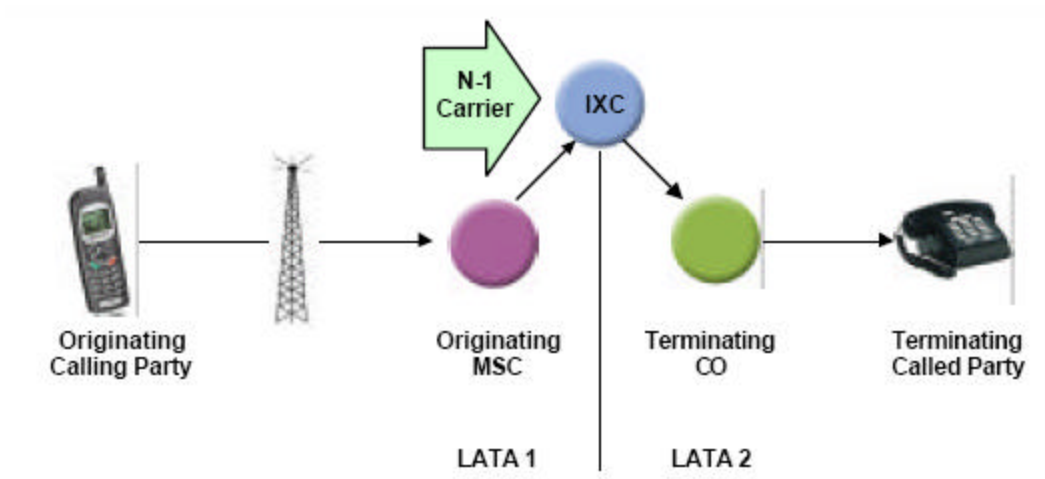
- Resolving conflicts; Getting Concurrence for both service providers; Due date monitoring; Monitoring of timers such as the expiry timer
- Activating ported numbers by sending requests down to service providers or carriers Local Service Management Systems (that actually provision/update data in the switch/STP/SCP)
- Notifying service providers or carriers of number ports
- Establish process times, concurrency times and window expiry times
- Operate 24/7 for updating service providers or carriers Local Service Management System
- Implement TRAI/LNPA-WG policies.
- Publish LNP standards and guidelines

We recommend a 24/7 LNPAC center handling number requests and activating number requests; connected to the service providers or carriers through dedicated high capacity trunk lines such as E1.



7. How should NLDOs and ILDOs handle the routing of calls to support number portability?

Applying the principle that the (N-1) carrier is responsible for providing the correct ported number by dipping into a number port database – if the NLDO or the ILDO is the (N-1) carrier then it is the responsibility of THE NLDO/ILDO to provide correct routing data.



Read IXC as NLDO or ILDO and LATA as SDCA in the above figure. In the example above, the IXC must provide the correct routing information for terminating the call.

8. Are the existing interconnection arrangements (such as signaling) between mobile-to-mobile, mobile-to-fixed networks sufficient to achieve number portability, or are any changes required?

This is hard to say at this point of time, as we need to study the infrastructure existing today. However, the following questions attempt to clarify the type of interconnection arrangements that will be necessary to handle MNP efficiently. From the viewpoint of a service provider or carrier, the most important factors to be considered are:

- Common database for maintaining ported numbers and local routing numbers for a Market segment (or for a number of Market segments), to which all switches of the service provider can “dip” and enquire LRN for a ported number using out of band signaling
- Throughput of the database system – as transaction rate will approach hundreds of thousands (maybe millions) a day
- Scalability of the database system – able to handle millions of ported numbers

A. Signaling

- What kind of signaling methods are service providers and carriers using today?
- Are there any signaling networks (Advanced Intelligent Networks) in place between service providers and carriers?
- Are there SS7 types of signaling networks in existence today?
- Do service providers and carriers use Signal Transfer Points (STPs) or Service Control Points (SCPs) or a Switch’s database for line information, global title translations, routing and call setup?
- If SCP databases exist, will they be capable of holding routing information?
- Is this signaling transparent to the services being offered – wireless, POTS, ISDN or E1?

B. Role of different carriers in Local Services

Within the existing licensing schemes, our understanding is that different types of licenses are available for local service providers (wireline and wireless) – market segment wise (state wise?), national carrier and international carrier. The following questions, though pertaining more to wireline porting, cannot be ruled out at the planning stage.

- How are the services being demarcated? For instance, can a national carrier or international carrier offer local services i.e. up to the “last” mile – direct to customer?
- If they cannot offer local services, is the hand off at “POP” (Point Of Presence) tandem switches? Or is the hand off handled differently based on service provider or carrier? (Questions on routing a call exist. Please refer next section).
- Are regulations set up for Resale/Wholesale of network services or elements – bundled or unbundled?
- Will “Number Portability” be a part of these Resale/Wholesale local services offerings between the various service providers and carriers?
- Are customers able to choose long distance carriers (national or international) today?

- Can the Customer keep porting his number from one service provider to another, to another service provider etc?

C. Routing/Call Setup

Depending on the answers for questions raised in the previous section, the following issues pertain to call routing and set-up.

- If there are “N” number of exchanges (switches) in the path between the originating calling party and terminating called party, which switch will be the responsible for providing the correct routing information - the “1” switch (originating switch) or the “N-1” switch?
- If there are differences in telephone numbering (say country wide TNs, area specific TNs), how will the routing be handled?
- For countrywide telephone numbers, where the STD code is not required for dialing, how will the call be setup?
- Does a Location Routing Number or similar concept exist today within the telecom network in India?
- Typically, where is the line information database being stored today?
- Do service providers or carriers use Global Title Translations or similar functions to get correct routing information?

9. Are there any technical issues in the portability of services such as SMS, data, voicemail, or fax?

Service portability is the assurance that a Customer will receive the exactly same services from a new provider that he received from his old service provider. Local number portability or Wireless local number portability provides for portability of the voice service only. It should not be assumed that other features or enhanced services would be ported. If a Customer changes his service from one service provider to another service provider, and if he had any enhanced services such as MMS, video services, or other special call processing programs, he may or may not be able to port these services/features to the new service provider.

When (and if) the TRAI mandates service portability, a new service provider or carrier when porting a customer will have to be able to port all the enhanced services and features that were provided by the old service provider.

However, given the nature of today's switches/exchanges, the following (at a minimum) are considered part of the voice services and the new carrier should be able to offer the same to the Customer:

- Caller ID
- Calling Name Presentation
- Short Messages Service Center
- Voice mail

It may not be able possible to predict transfer of services other than voice, such as Data and Fax, at this point of time.

10. What problems do you foresee with the current National Numbering Plan in implementing number portability that may necessitate the modification of the existing National Numbering Plan?

With the introduction of local number portability, individual directory numbers in one NPA-NXX may be moved to a different telephone switch. Therefore, the first six digits of a directory number (NPA-NXX) no longer uniquely identify the switch that serves that customer. To identify the correct switch, the concept of a location routing number (LRN) was introduced by industry experts and approved by the FCC. Each switch that hosts portable numbers will be assigned a 10-digit LRN that will be used in routing a call to that switch. The order calls for porting only within a rate center. A rate center, or the portability domain, is an area (usually under the jurisdiction of the state Public Utilities Commission) in which directory numbers can be ported. All LNP-capable network elements, including service switching points (SSPs), signal transfer points (STPs), and signal control points (SCPs), must maintain a list of NPA-NXXs that are considered portable.

The points mentioned below are our assumptions. We need to study the correctness of our assumptions.

- The current National Numbering Plan maybe adequate to control assignment of the following:
 - SDCA
 - Area Codes (existing as STD codes), which also represents the “Central Office” or “Point Of Presence” for an area (say Hyderabad POP/CO is “40”)
 - Service Provider within an area (say BSNL is “2”)
 - Exchange Codes that identify specific switches (say Charminar is “45”)??
 - Line Number is the remaining 5-digit number??
- As shown above, the demarcation of a land line (wire-line) number is not clear yet.
- What happens in case of a “split” – i.e. either by adding new switches or increasing the capacity of a switch - within an area code?
- The same applies for a mobile number; though accurate identification of a number is achieved by looking up the MSID (IMSI) and the MSISDN.

To emphasize, demarcation of the existing Telephone Number and constructing a new 10-digit or 12-digit representation will help India in the long run as penetration grows. We recommend setting up a committee that can go into the feasibility of changing the existing Telephone Numbering system.

11. Should number portability related charges be regulated? If not, then what measures will ensure that the portability charges are not set such as to discourage portability?

Yes, Number Portability related charges must be regulated

There are three types of costs that are involved in providing long-term service provider portability:

- Costs incurred by the industry as a whole, such as those incurred by the third-party Local Number Portability Administrator to build, operate, and maintain the databases needed to provide number portability
- Carrier-specific costs directly related to providing number portability
- Carrier-specific costs not directly related to number portability ().

With the implementation of long-term number portability measures, all service providers and carriers will incur costs specific to the deployment and usage of number portability databases. These charges fall into three categories:

- Non-recurring costs, including the development and implementation of the hardware and software for the database
- Recurring (monthly or annually) costs, such as the maintenance, operation, security, administration, and physical property associated with the database
- Costs for uploading, downloading, and querying number portability database information.

Carrier specific costs directly related to number portability will include:

- Costs to purchase the switch software implementing number portability

Carrier specific indirect costs may include:

- Costs of network upgrades necessary to implement a database method such as a common channel signaling system and setting up SCP/STP databases

12. What measures will ensure tariff transparency?

The following principles should ensure tariff transparency:

- A competitively neutral cost recovery mechanism should not give one service provider an appreciable, incremental cost advantage over another service provider, when competing for a specific subscriber
- A competitively neutral cost recovery mechanism should not have a disparate effect on the ability of competing service providers to earn a normal return.

The cost and effort of deploying a number portability infrastructure can prove prohibitive for carriers and may delay deployment. As number portability has evolved, a variety of deployment options, ranging from full self-deployment to complete outsourcing, have emerged. Before deciding on an approach, each service provider or carrier should evaluate the technology and maintenance costs associated with implementation and ongoing operation of the system as well as flexibility, time to market, technical expertise, and internal resources. Both wireline and wireless carriers must carefully analyze their needs, capabilities, and objectives to determine how best to deploy and manage LNP.

The following are some proposals on tariff transparency while recovering number portability costs, based on the three charges discussed in the previous question:

Costs incurred by the industry as a whole:

- Whether the first two subcategories, non-recurring and recurring costs, should be recovered through monthly charges to the individual carriers using the database, allocated in proportion to each carrier's gross telecommunications revenues net of payments to other carriers, or from all carriers operating in areas where number portability is offered.
- Whether non-recurring charges could be recovered in a one-time payment or over time.
- Whether the third subcategory (upload/download/per-query costs) could be recovered through usage charges assessed on those carriers that either access the database to upload number portability routing information, download such information, or directly query the database. Those carriers, including NLDOs and ILDOs, could then either recover such costs from their own customer base, or choose not to recover such costs.
- Whether the upload, download, and/or per-query costs could be folded into the monthly charges assessed on the carriers using the databases, which would be allocated in proportion to each carrier's gross telecommunications revenues.

Carrier specific direct costs:

- Whether individual service providers or carriers bear their own costs of deploying number portability in their networks or whether all carriers in a given region to pool their number portability costs, which then would be spread across all carriers providing and using number portability based on some allocation, such as gross telecommunications revenues or number of subscriber lines.

- Whether the incumbent service provider or carrier may recover the costs of providing number portability, from either end users or other carriers (such as other local exchange service providers, mobile service providers, NLDOs, ILDOs and resellers)
- Whether to allow carriers the flexibility to recover their number portability-specific costs from their customers in whatever manner the carrier chooses. Or whether to require carriers to recover their number portability-specific costs through a number portability charge assessed on their end user customers located in areas where number portability is available.
- Whether, under any cost recovery mechanism, the cost to consumers should:
 - Vary among carriers in a given geographic region
 - Remain constant among all carriers in a given geographic region; or
 - Vary among different geographic regions, e.g., within Market segments (area codes) or SDCAs
- Whether such costs to consumers should be permitted to change, for example, on a monthly or annual basis.
- Whether carriers should charge their customers a single, one-time charge, a monthly fee, or some percentage of the customer's monthly bill, to recover their carrier-specific number portability-specific costs.
- Whether such a charge should be specifically identified on consumer bills from those carriers as a separate line item.
- Whether any such charge should be filed as a tariff at either the national or state level.
- Whether carriers should be permitted to recover carrier-specific, number portability-specific costs from other carriers, through increases in charges for regulated services.

Carrier specific indirect costs:

- Whether carrier-specific costs not directly related to number portability should be borne by individual carriers as network upgrades.
- Whether we should specify a particular recovery mechanism for carrier-specific costs not directly related to number portability should be specified by TRAI?

13. Considering that the Indian market is a growing market and number portability offers the possibility of attracting customers by an efficient operator, should it be mandated that the cost of the number portability should be absorbed by recipient network?

No. In our opinion, the cost of the number portability being absorbed by recipient network should not be mandated. We feel that it should be left to the recipient network to decide on how he is going to handle it.

14. Please share any additional information that you might have about number portability implementations in countries and jurisdictions around the world, and what we might learn from these experiences.

DSET Corporation, a sister concern of NE Technologies has considerable experience in Local Number Portability and Wireless Local Number Portability (MNP in the USA) in the United States of America, since 1996 when FCC passed the mandates for porting of numbers. The following paragraphs summarize the US experience of LNP implementation:

Jul 2, 1996 The original FCC mandate (First Order and Report and Further Notice on Proposed Rulemaking FCC 96 286 (CC Docket No. 95-116)¹ released on July 2, 1996 required that all wireless carriers be ready for querying dialed numbers and delivering calls to ported numbers throughout North America by December 31, 1998.

In addition, wireless carriers had to be ready to port numbers between the other carriers in the same market by June 30, 1999. The same date was set for when wireless carriers had to be able to support nationwide roaming. This mandate also indicated that wireless-to-wireline porting and wireline-to-wireless porting was considered service provider portability and not service portability. Therefore it was to begin on June 30, 1999. Another key feature of the original mandate was recognizing that the LRN methodology as the preferred method for implementing portability.

Mar 11, 1997 The first change to the order came when the FCC issued a reconsideration order on March 11, 1997, First Memorandum Opinion and Order on Reconsideration FCC 97-074 (CC – Docket 95-116)². This reconsideration order clarified a few issues and further outlined plans for number portability. Most notably, it stated that providers must offer service provider portability in the 100 largest MSAs and support nationwide roaming. It further stated that carriers in the top 100 MSAs had to deploy portability only if they have received a specific request at least nine months before the June 30, 1999 deadline. Which meant that the request had to be received by September 30, 1998. A final important point to note was that carriers in the smaller markets didn't have to provide portability until the later of six months after June 30, 1999, or six months after receiving a bona fide request to provide portability.

Aug 18, 1997 The next change to the number portability mandates came on August 18, 1997, when the FCC issued their Second Report and Order FCC 97-289 (CC Docket 95-116)³. This change to the mandates clarified the concept of the N-1 carrier as the one responsible for querying the dialed digits to see if the number has been ported or not. This was done so that all carriers could know which carrier was responsible for performing queries (and bearing the cost of the query), which would increase the overall call routing efficiency. As part of this order, it was noted that if the call was not queried and delivered to the donor network, the donor network could – if network reliability was being degraded in specific ways – block the call. The mandate further urged carriers to make arrangements with LECs to ensure calls by their subscribers are not blocked. And finally, of interest to wireless carriers, it noted that if a carrier performs database queries on calls delivered to it that should have been routed differently by the N-1 carrier it may charge the N-1 carrier. But it didn't set any guidelines for what level of charges would be allowed. This means if a wireless carrier doesn't query calls on which it is the N-1 carrier (a subscriber calling a local number on the PSTN for example) then the LEC can charge the wireless carrier for doing that query.

Nov 24, 1997 As a result of the Cellular Telecommunications Industry Association (CTIA – now known as the Cellular Telecommunications and Internet Association) filing a petition seeking a waiver of the implementation schedule for wireless number portability, the FCC issued a

Public Notice (DA 97-2579)⁴. This public notice requested comments on CTIA's position that the Wireless Telecommunications Bureau of the FCC should use its authority to establish a new service provider number portability implementation date of March 31, 2000.

- May 12, 1998 The FCC issued a Third Report and Order FCC 98-082 (CC Docket 95-116)⁵ that clarified cost recovery for local number portability for both LECs and wireless carriers. The report ordered that costs incurred by the carriers should be recovered in a competitively neutral manner since all carriers would benefit from LNP. LECs were allowed (but not required) to recover their costs from their subscriber via a line charge for a period of five years with an approved tariff. All others, including wireless carriers, could recover their costs in any lawful manner they chose as long as they don't say the charge is a mandate or mandatory fee assigned by the FCC.
- Sep 1, 1998 The FCC issued a Memorandum Opinion and Order (DA 98-1763, CC Docket 95-116)⁶ that adjusted the time frames for wireless carriers in response to the petition by the CTIA. On that date, they granted a nine- month delay to the date when wireless carriers must provide number portability between themselves moving the date out to March 31, 2000. The reason for this delay was that the FCC didn't want to jeopardize nationwide roaming by rushing wireless carriers to meet the current deadline. The deadline was considered in jeopardy because the wireless standards bodies had not yet finalized standards and without those standards, vendors couldn't produce equipment and software to be in place in wireless carriers' network and systems with adequate time for testing before cut over.
- Feb 8, 1999 The FCC issued another Memorandum Opinion and Order with FCC 99-019 (CC Docket 95-116)⁷ that pushed the date out even further to November 24, 2002, which is when the five-year build out of PCS licenses is to be complete. One of the reasons for this 4 additional delay given by the FCC was that number portability might actually hinder rather than promote competition because meeting a number portability mandate would draw PCS carriers' resources away from building and completing their networks. And without comparable network coverage, the FCC decided that PCS carriers could not compete effectively. In addition, delaying network build out reduced the number of people who could be served by wireless – particularly in already underserved rural areas. Thus, the benefits of number portability were outweighed by the benefits of completing network build out.

Mandate Summary

To summarize, the mandate for wireless number portability was that carriers with a license in one of the largest 100 MSAs must be ready to port numbers to other carriers by November 24, 2002. However, the wireless industry determined they did not want to make a flash cut to portability at the deadline during the busy and critical holiday shopping season. The industry also wanted to make the change before the deadline so that if problems arose they could be resolved early. Therefore, the industry set September 1, 2002 as the date when wireless carriers should begin to port numbers with other carriers as a test of the WLNP system. Of course, if WNLN forbearance is granted that date could change significantly. Carriers outside of a top 100 MSA are not immune to porting number requirements. On the contrary, although they do not have a specific deadline to port numbers, these "rural" carriers must be ready to port numbers within six months after receiving a bona fide request from another carrier. Therefore, even the smallest of carriers in the smallest of markets should devise a plan that will allow them to implement changes to their network to allow the porting numbers within six months. In addition, all carriers must be able to support the completion of calls to and from ported numbers. That means if one of these wireless consumers with a ported number roams into your market, or if your license covers territory that is in the same LATA as a top 100 MSA, you'll need to be able to route their Intra-LATA calls to the correct carrier (inter-LATA calls will be queried by another carrier such as the IXC).

Given below is a sample implementation table for the North American (USA) market for Wireless Local Number Portability:

An Implementation Time Table	Carriers in 100 MSAs	Carriers in area with ported numbers	All other Carriers
Must deliver calls to ported wireline numbers	Current requirement (since 12/31/1998)	Current requirement (since 12/31/1998)	N/A unless an NPA-NXX in the LATA is opened for porting
Must "register" with NPAC	May 1, 2001	May 1, 2001	May 1, 2001
Must test SOA communications*	May 1, 2001 testing begins and continues as needed	May 1, 2001 testing begins and continues as needed	During six months after a wireless NPA-NXX opens for porting in the LATA
Must test Inter-Carrier Communications Process*	April 1, 2002	During six months after a wireless NPA-NXX opens for porting in the LATA	During six months after a wireless NPA-NXX opens for porting in the LATA
Must test number portability queries*	April 1, 2002 (if running own WLNP database)	April 1, 2002 (if running own WLNP database)	During six months after a wireless NPA-NXX opens for porting in the LATA
Wireless porting deployed (CTIA)	Sept. 1, 2002	Within six months after written bona fide request	Within six months after written bona fide request
Must deliver calls to ported wireless numbers	Sept 1, 2002	Sept 1, 2002	Within six months after a wireless NPA-NXX opens for porting in the LATA
Must support roamers from other markets with ported numbers	Sept. 1, 2002	Sept. 1, 2002	Sept. 1, 2002
Must port numbers by to avoid penalties (FCC)	Nov. 24, 2002	Within six months after written bona fide request	Within six months after written bona fide request
Funding	Up to each carrier on state-by-state basis	Up to each carrier on state-by-state basis	Up to each carrier on state-by-state basis

The experiences that the US faced, is what we will face in India also. By drawing on these experiences, we can avoid many of the pitfalls. The following are the

15. Give your comments, with reasons, as to when number portability should be introduced in India?

- As early as possible before market penetration becomes so high that it causes a more phased out MNP implementation
- When the market penetration is low and the predicted number of ports are low, it is easier to implement a nation wide roll out plan
- TRAI should start with Mobile Number Portability but then should also seriously think about wireline (land line) local number portability services also. (In the USA, both local number portability and wireless number portability were considered at the same time).

16. Should MNP be implemented progressively by service area or directly across the nation at one time?

We are of the opinion that there should be a progressive implementation of MNP by service areas with a timetable defined for the entire country. The types of roll out we are suggesting is the following:

A master time-table (project schedule) needs to be generated indicating dates for enforcement of MNP based on both short term and long-term plans:

- Dates for finalizing short term roll outs
- Date for setting up Working Group for addressing industry issues on Mobile Number Porting.
- Dates for service providers to implement MNP based on short-term policies for “A” grade cities (Phase 1) and “B” grade cities (Phase 2).

Determine dates for finalizing long-term rollouts

- Dates for setting up sub-committees to work out the problems of Numbering, LRN and Number Portability Administration Centers (if decided)
- Dates for tender, receipt and finalization of a 3rd party independent and neutral vendor for running the Number Portability Center
- Dates for phased implementation of long term MNP (& LNP) roll outs

A phased roll out is recommended because:

- Not all Markets (areas) are being covered by two or more competing service providers (where only one service provider may exist in a market area, in which case there is no need for MNP).
- Not all switches may be capable of handling MNP and these switches may have to be upgraded.
- Prototype rollout in a small market segment, conducted on an experimental basis, should help further finalize the nation wide infrastructure that may be required
- (After prototype roll out), Final goals are to implement this starting with those Market segments that are most active – maybe cities with more than 10,00,000 population?

17. What will be the effect, if any, on the different aspects of implementation if phased rollout is adopted?

The effects of implementing a phased roll out will be:

- Testing MNP in a small market segment ensures full functional and inter-operable testing of a prototype
- A phased roll out gives TRAI, service providers and carriers a chance to prioritize and distribute MNP related work over a longer period of time.
- The costs of implementing MNP are phased out and will not suddenly be a big burden on the common man
- The costs of implementing MNP are phased out and will not suddenly be a big burden on the service providers or carriers
- The testing cycles can be elaborate and detailed enough to implement thorough Turn UP Testing, Inter-Operability Testing and Group Testing.
- The Working Group will have to resolve fewer issues and can remain focused in the initial stage to ensure that the industry-the various committees-TRAI are actively cooperating with each other.