



ATIS-0300082

Network Interconnection Interoperability Forum,
(NIIF)

Guidelines for Reporting Local Number Portability Troubles
in a Multiple Service Provider Environment



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ATIS-0300082, Guidelines for Reporting Local Number Portability Troubles in a Multiple Service Provider Environment. Formerly NIIF 0004

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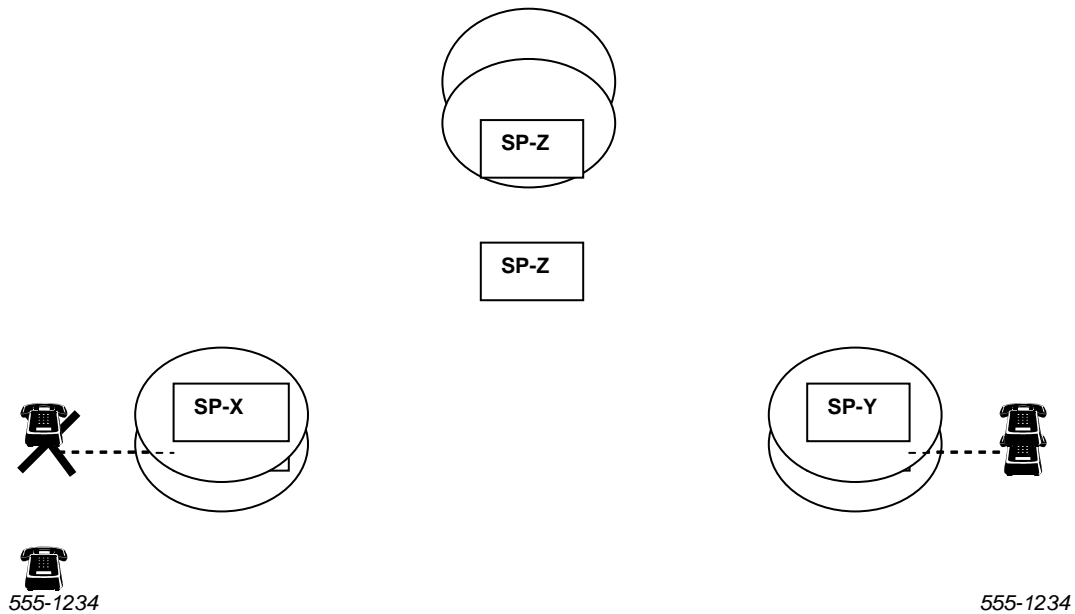
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INTRODUCTION

This document is intended as an aid in reporting and resolving troubles involving Local Number Portability. This document is not meant to replace or supersede other NIIF agreements and procedures.

Due to the complexity of LNP, problem resolution can involve ILECs, CLECs, IXCs and Wireless Carriers, as well as 3rd party Database and Service Bureau Providers. This service relies almost exclusively on network element provisioning being performed/timed correctly throughout all networks. Trouble reporting should be handled following processes and procedures developed by each entity. Troubles should not be reported to another entity's field personnel directly. If order/repair processes are not followed, it is difficult to measure performance, trouble types, volumes or to initiate possible required billing.

For the purposes of this document, SP-X is the "ported from/donor" network, SP-Y is the "ported to/recipient" network, and SP-Z is neither the "ported from" nor the "ported to" network, but may be another service provider(s) involved in the trouble report. SP-Z may be a long distance carrier network, another local service provider's network or access tandem service provider network. There are procedures in the NIIF Reference Document for trouble reporting in a multiple service provider environment.



LNP MULTIPLE SERVICE PROVIDER ENVIRONMENT

Each service provider should attempt to clear trouble within their network before referring trouble to another service provider. In a LNP multiple service provider environment as depicted above, responsibility for initiating a trouble report should be based on one of the following conditions:

1. If ported customer(s) belonging to SP-Y report that they cannot receive calls from SP-X, then SP-Y should initiate a trouble report to SP-X.
2. If customer(s) belonging to SP-X report that they cannot complete calls to ported customer(s) of SP-Y, then SP-X should initiate a trouble report to SP-Y.
3. If ported customer(s) belonging to SP-Y report that they cannot receive calls from SP-Z, then SP-Y should initiate a trouble report based on NIIF guidelines for dealing with trouble reporting in a multi-service provider environment.
4. If customer(s) belonging to SP-Z report that they cannot complete calls to ported customer(s) of SP-Y, then SP-Z should initiate a trouble report based on NIIF guidelines for dealing with trouble reporting in a multi-service provider environment.
5. If a “port-in-error” occurs between SP-X and SP-Y, and the customer has not reported the problem, the SP that identifies the problem should initiate the trouble report to SP-X.

Additional scenarios related to IXC situations are included in this document as Appendix A. These scenarios may provide additional information and guidance in resolving LNP trouble cases. Please note that the service provider nomenclature used in Appendix A does not conform to the nomenclature in the body of this document.

Considerations Prior to LNP Trouble Reporting

This section provides considerations to assist in the identification of an LNP trouble in a service provider’s network. These are not meant to be conditions for accepting a trouble report. The considerations listed have been grouped into three categories; Network Architecture, Network Provisioning and Customer Provisioning. It is important to be familiar with the content in all listed categories to aid in the successful identification of an LNP case of trouble and its resolution.

NETWORK ARCHITECTURE

The following bullet list represents network architecture components or activities that should be considered in the identification of LNP troubles:

- LRN Database
 - Network Element Translations

- Local Exchange Routing Guide (LERG)
- NPA Splits
- 1000 Block Number Pooling

The following considerations are intended to further assist in isolating the cause of these LNP troubles:

Interconnection Agreements are required to be in place to properly route calls.

Inter Service Provider testing should be performed with the service providers in the rate area to ensure seamless port capability to all customers.

LNP network element failures, such as switch or LNP database could be causing the trouble.

Switch LRNs and any portable NPA-NXXs should be populated in the LERG.

Portable NPA-NXXs should be properly opened in all appropriate network elements, including End Offices, Tandems, Intermediate/Gateway STPs and Databases.

End Office(s) database translations, routing, triggers and Location Routing Numbers (LRNs) should be known and verified.

Identify the involved SS7 and LNP network provider(s). (They may be different providers.)

The ISVM/8XX/CLASS/LIDB services do not port with the telephone number and must be addressed by the "ported to" service provider. If the provider of these services has recently changed, associated Subscription Versions (SV) must be modified with the new point code and SSN as instructed by the new provider. These services may be provisioned by multiple providers and associated agreements must be in place.

The access tandem should be capable of performing LNP queries.

A non-facilities based reseller should contact their facility provider to determine if there are any network failures.

Interworking (SS7-MF trunking) may result in LNP troubles. Non-SS7 trunks in the call path and the SS7-MF interworking functionality should be identified and verified.

In the case of a recent NPA split, ensure that the portable NPA-NXXs have been properly provisioned in all appropriate network elements (end office, tandem, database, customer PBX, etc.).

NETWORK PROVISIONING

The following bullet list represents network provisioning components or activities that should be considered in the identification of LNP troubles:

- Service Order Administration (SOA)
- Number Portability Administrative Center (NPAC)
- Local Service Management System (LSMS)
- Local Exchange Routing Guide (LERG)
- Access Service Request (ASR)
- Firm Order Confirmation (FOC)
- Provider Specific Provisioning Systems
- NPA Splits (SOA/NPAC/LSMS/Provider Specific Provisioning Systems)
- 1000 Block Number Pooling (Pooling Administrator Data Exchange/ SOA/NPAC/LERG/LSMS/Provider Specific Provisioning Systems)

The following considerations are intended to further assist in isolating the cause of these LNP troubles:

Verify that the LERG reflects the accurate routing information.

Verify that an ASR was issued.

Validate that the switch LRN(s) were created in the NPAC system.

Verify that all portable NPA-NXXs have been populated in SOA/NPAC/LSMS/LERG systems.

Verify that all required Destination Point Codes (DPCs) for services (CLASS/LIDB/ CNAM) been properly provisioned in all required network elements and are listed in the LERG.

End offices experiencing error messages (Cause Code 26s) are a result of misrouted calls to a ported number. For example, in the basic call flow, if the end user re-ports without the necessary database changes, a call routed to the end user will fail.

If more than one LATA is served from your switch, ensure that the LRN assigned is from the same LATA as the ported number.

In the case of a recent NPA split, ensure that the new NPA-NXXs have been properly provisioned in all appropriate provisioning systems. If the NPA-NXX of a LRN was changed coincident with a NPA split, verify that the LRN has been changed and updated in the LERG and NPAC systems. Also verify that the active SVs associated with the new NPA-NXX have been updated in the NPAC system with the new LRN prior to the end of the Permissive Dialing Period.

In a 1K block number pooling environment, ensure that blocks donated to the industry inventory pool are removed from appropriate provisioning systems to prevent duplicate number assignments.

CUSTOMER PROVISIONING

The following bullet list represents customer provisioning components or activities that should be considered in the identification of LNP troubles:

- Inter-company Data Exchange Completion
 - LSR
 - FOC
- Donor/New Switch translation
- End Office Switching and Facilities
- Activation/Broadcast
 - LRN
 - MRS (message relay service) Routing function
 - GTT
 - LIDB CNAM
 - ISVM
- 1000 BLOCK NUMBER POOLING
 - ISPP (Intra Service Provider Port)
 - Block-holder contaminated verification

The following considerations are intended to further assist in isolating the cause of these LNP troubles:

Verify that the Local Services Ordering Guide (LSOG) process has been followed correctly.

Verify that the Local Service Request (LSR) was issued and that the FOC was received before entering a service order activation transaction. If a FOC was not returned, the new customer may not be disconnected in the end office which will result in a “can’t receive some calls” report. The FOC provides some protection from “slamming” accusations or inadvertent porting.

Verify that the current status of the TN(s) is reflected correctly in the SOA system using the mechanisms available such as reports, history and query functionality. If the TN(s) has an incorrect status, then follow local methods and procedures to correct the status.

SOA should ensure that the NPAC system is not in a sending mode on this activation before performing an NPAC system audit. If the NPAC system is in a sending mode for this activation, the NPAC system will ignore the submitted subscription information and rebroadcast the last firm subscription data previously populated in the NPAC system.

Verify that no NPAC system LNP provisioning failures have been received. If an LNP failure alert has been received, verify the data and resubmit the activation.

Verify that the activation of the TN(s) has not failed to any or all LSMSs. Determine if failure or partial failure messages have been received from the NPAC system. If failure messages have been received, work with the NPAC to resolve those failures.

At times, all LSMS databases are not synched. Verify the NPAC database by system query or call to the NPAC and analyze the results. To update an out of synch LSMS database, either request the NPAC to rebroadcast the subscription version or launch an audit from the NPAC system to the LSMSs. An NPAC system audit can download the information it contains to all LSMSs and will update all provider databases. An NPAC system audit can also download the updated information to a specific carrier if requested.

If associated services (LIDB/CNAM/ISVM/CLASS) are provided, the ported TN's SV information in the NPAC database should include a gateway or intermediate destination point code, with corresponding subsystem numbers of zero or null value to prevent routing conflicts.

A large TN port involving 20 lines or more should be handled as a coordinated cut or coordinated "Hot Cut". If the trouble is related to a recent "large TN port", then determine if all lines/services were verified with the customer after the port took place. This verification helps prevent "partial ports" or end users "ported in error".

Determine if the 10-digit trigger was originally applied in the donor switch. If the 10-digit trigger is not appropriate or applied, verify that the donor switch translations have been removed at the time of port.

"Can't be called" troubles may be the result of a Port to Original (PTO) (return to native) which has not followed documented processes for PTOs. A customer desiring to return to their original (native) switch initiates the process by contacting the native switch service provider, who completes a service order process to port to original. An order will be issued to disconnect the customer's number from their end office translations and remove the number from the NPAC database. If this is not done, the customer will experience "can't be called" troubles.

INFORMATION FOR TROUBLE REPORTING

In order to expedite LNP trouble reporting, a 24-hour, 7-day point of contact and telephone number is required for each company. This point of contact should be staffed by LNP

qualified technicians. The NIIF maintains the National LNP Contact Directory, located at <http://www.atis.org/atis/clc/niif/niifdocs.htm>.

SP-Y will be responsible for the acceptance of trouble reports from their end user. SP-Y should first test to determine if a trouble is in their network. If the trouble is found in their network, SP-Y will clear the trouble and no referral to SP-X is necessary. If the trouble is sectionalized by SP-Y towards SP-X, the trouble report will be referred to the SP-X. SP-X will clear the trouble or will work cooperatively with SP-Y to sectionalize the trouble where necessary.

The following items are information that is required by Service Provider's LNP trouble reporting center and should be exchanged when handing off or referring the trouble:

- Trouble Report Number Or Equivalent
- Company Name
- Service Provider ID (SPID(S))
- Contact Telephone Number
- Contact ID (I.E., Name Or Initials)
- Time And Date Report Was Received
- 10 Digit Telephone Number Reported In Trouble.
- Full Trouble Description.
- Location Routing Number(S)
- Old And New Provider And The Porting Date, If Available, If The Number You Are Reporting Is Ported.
- Full 10-Digit Telephone Numbers (Originating And Terminating) Of The End Users Experiencing The Problem If These Are "Can't Call" Or "Can't Be Called" Reports.

Additional information that may be helpful when handing off or referring the trouble includes:

- Tests Performed And Results (If Requested)
- Trunking ID
- Non-Circuit Specific (Circuit ID May Not Be Appropriate)
- Dispatch Authorization

- Date And Time Of The Call If Known And Office CLLI Codes (Donor And Recipient Switches)
- Home Tandem As Identified In The LERG
- Results Of NPAC Audit
- Call Type, e.g. O+, CLASS (*66, *69), Toll, Casual Dialing (101xxxx)
- Call Origination (e.g., Inmate Facility Or PBX)
- Other Information That May Be Of Assistance (e.g., History, Subsequent Reports)

Appendix A

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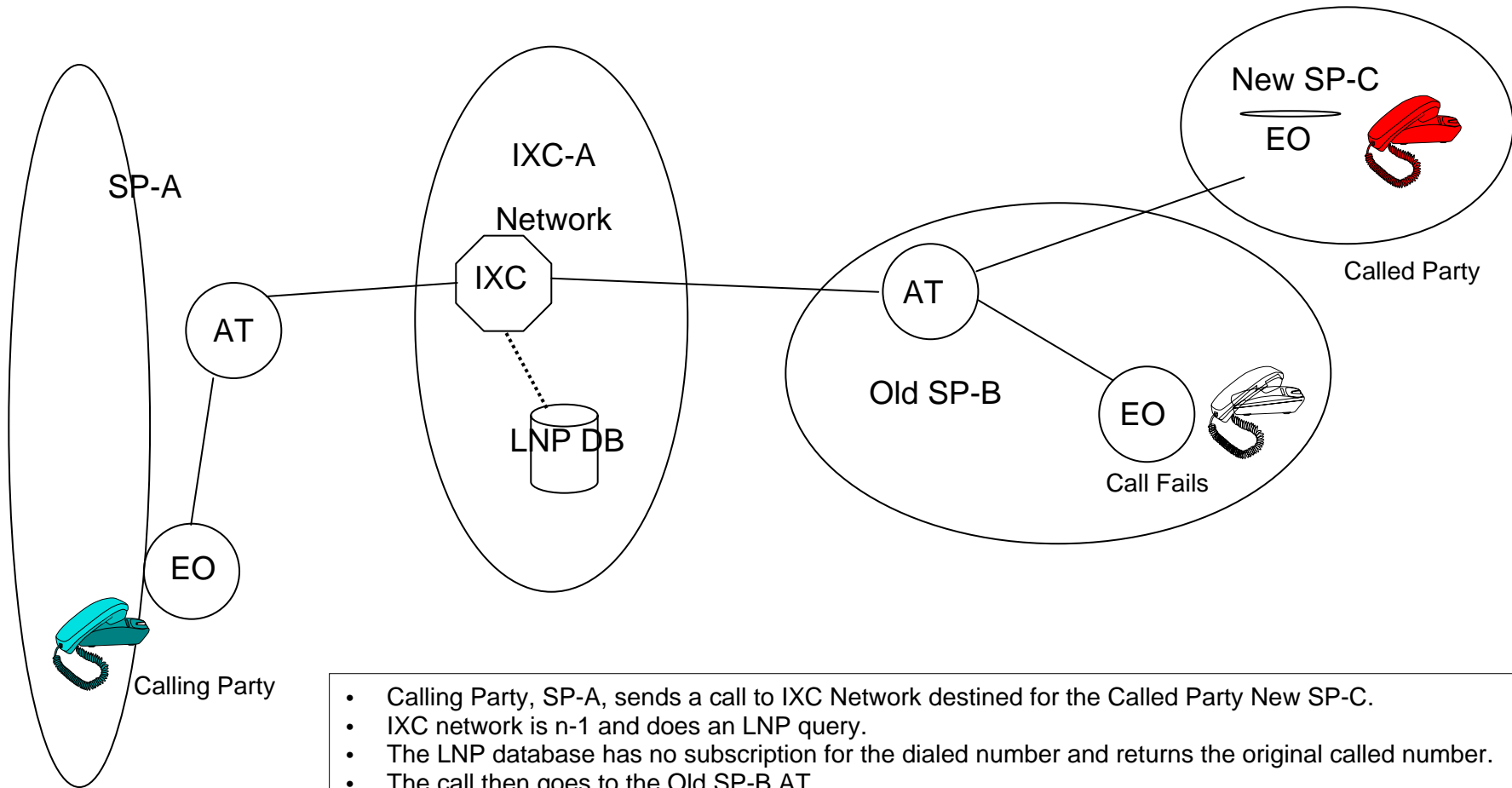
Scenario #4 Call Type:

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Scenario #5 Call Type:

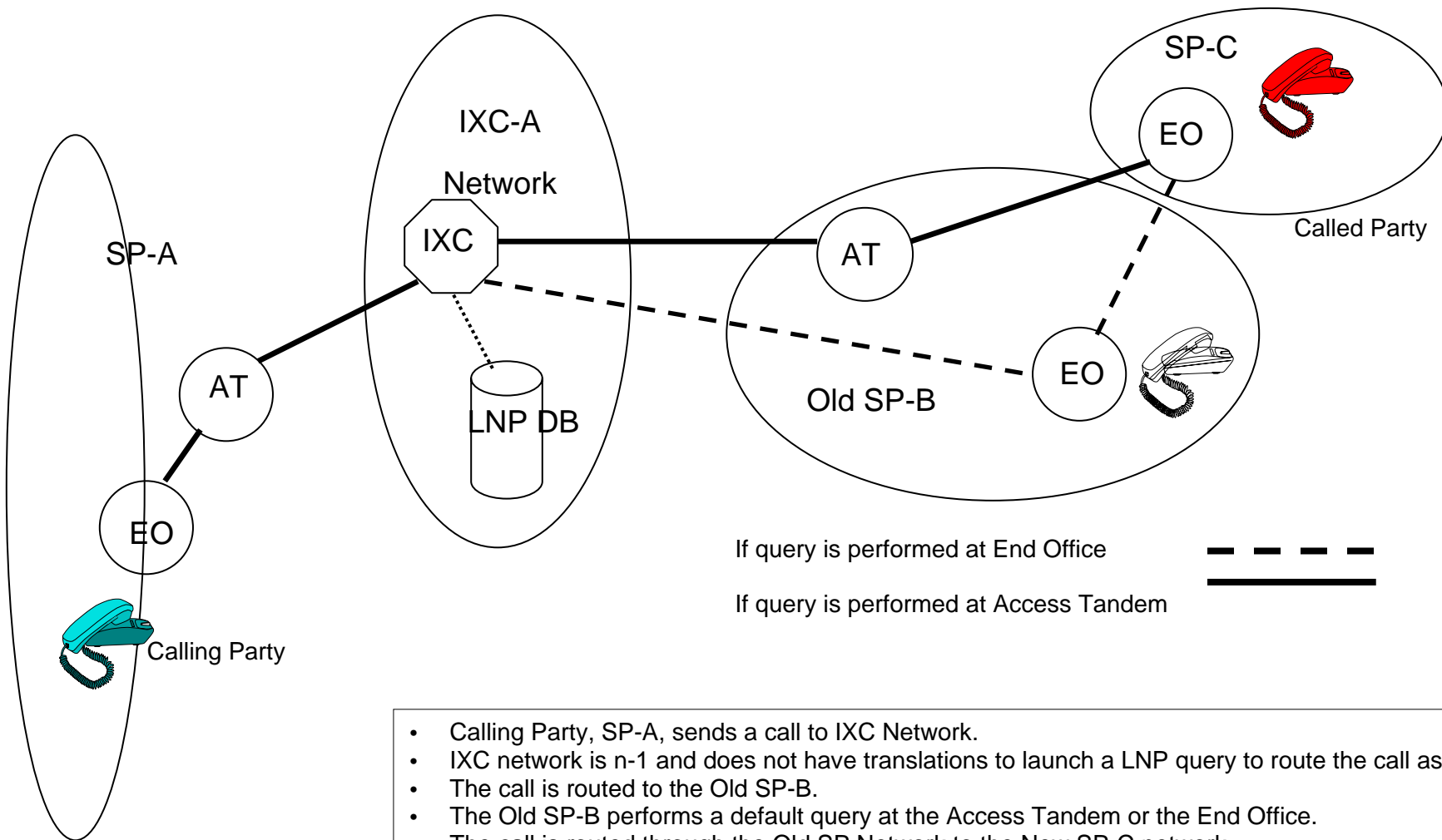
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Scenario #1: "N-1 Provider is missing subscription in the LNP Database LNP DB" NE database



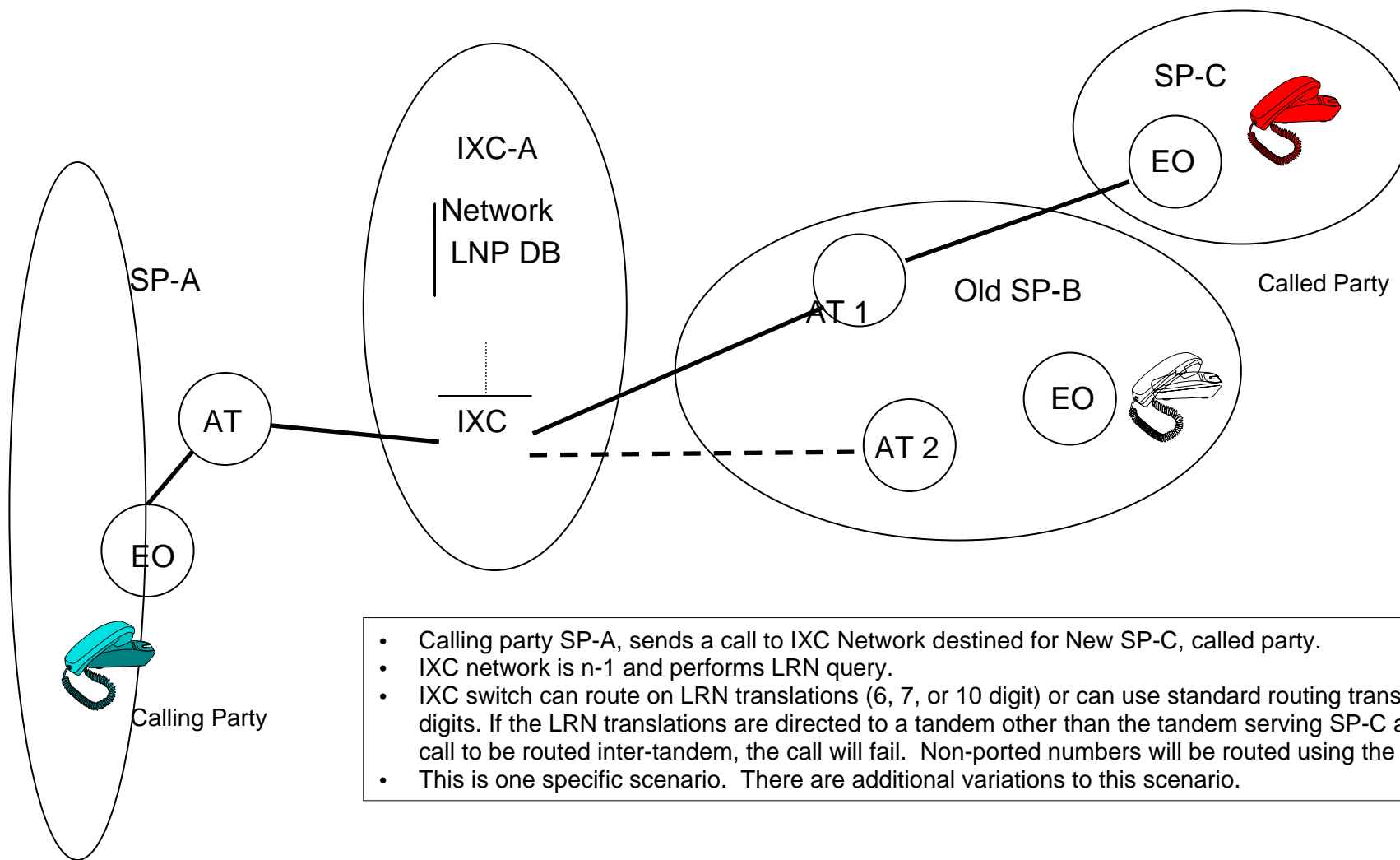
- Calling Party, SP-A, sends a call to IXC Network destined for the Called Party New SP-C.
- IXC network is n-1 and does an LNP query.
- The LNP database has no subscription for the dialed number and returns the original called number.
- The call then goes to the Old SP-B AT.
- The call is routed based on the called number because the FCI (Forward Call Indicator) bit is set indicating a lookup has previously been done.
- The call then goes to the Old SP-B EO and fails because the called number is not working in that office. Because the FCI is set, the end office will not launch another query.

Scenario #2: "N-1 Provider does not have translations to launch a LNP query to route the call.



- Calling Party, SP-A, sends a call to IXC Network.
- IXC network is n-1 and does not have translations to launch a LNP query to route the call as expected.
- The call is routed to the Old SP-B.
- The Old SP-B performs a default query at the Access Tandem or the End Office.
- The call is routed through the Old SP Network to the New SP-C network.
- Call completes, but billing and access charges may be incorrect.

Scenario #3: "N-1 Provider Routes Call to Non-Serving Access Tandem"

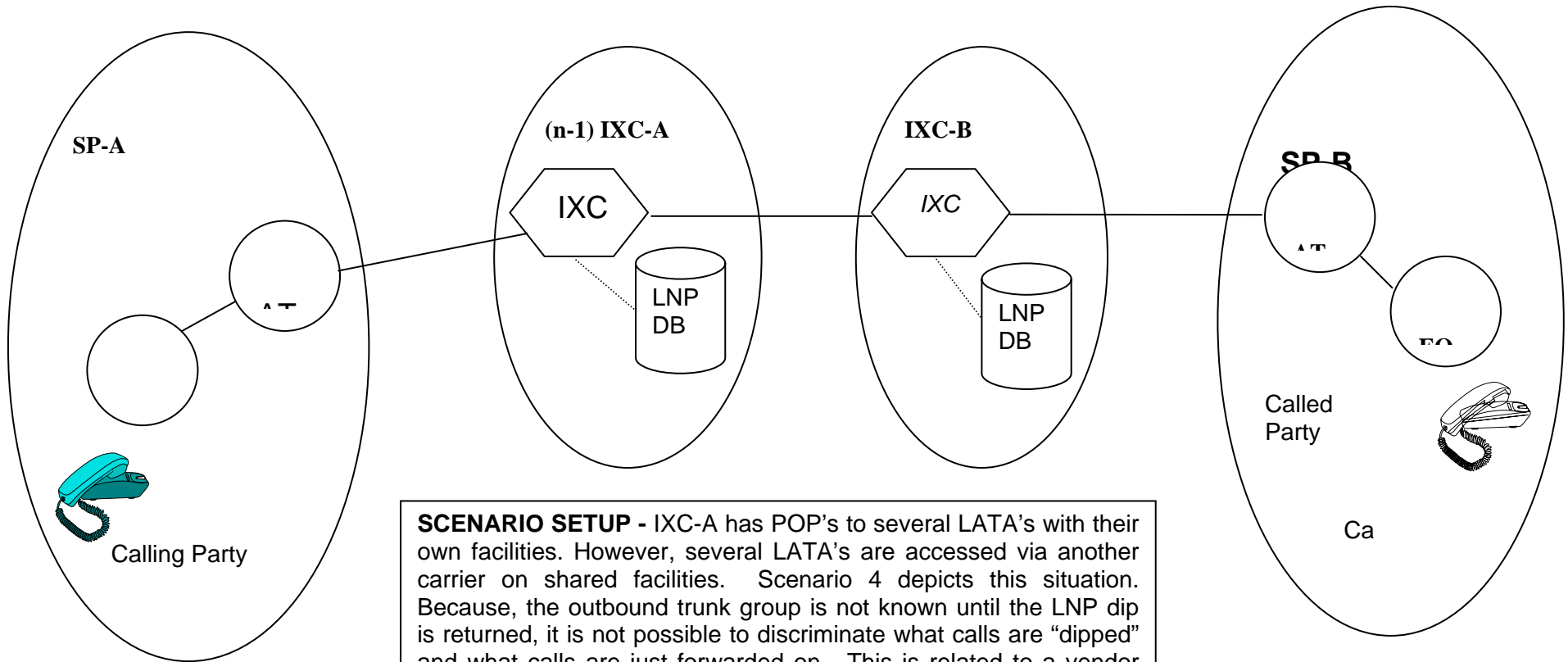


- Calling party SP-A, sends a call to IXC Network destined for New SP-C, called party.
- IXC network is n-1 and performs LRN query.
- IXC switch can route on LRN translations (6, 7, or 10 digit) or can use standard routing translations to route digits. If the LRN translations are directed to a tandem other than the tandem serving SP-C and , if SP-B do call to be routed inter-tandem, the call will fail. Non-ported numbers will be routed using the standard routing.
- This is one specific scenario. There are additional variations to this scenario.

If call is directed to the Non-serving Access Tandem

If call is directed to the Serving Access Tandem

Scenario 4: "N-1 Carrier Launches Second Query on LRN"



SCENARIO SETUP - IXC-A has POP's to several LATA's with their own facilities. However, several LATA's are accessed via another carrier on shared facilities. Scenario 4 depicts this situation. Because, the outbound trunk group is not known until the LNP dip is returned, it is not possible to discriminate what calls are "dipped" and what calls are just forwarded on. This is related to a vendor problem and is expected to be rectified in the future.

Calling Party, SP-A, dials 1+10 digits sending call to IXC-A.

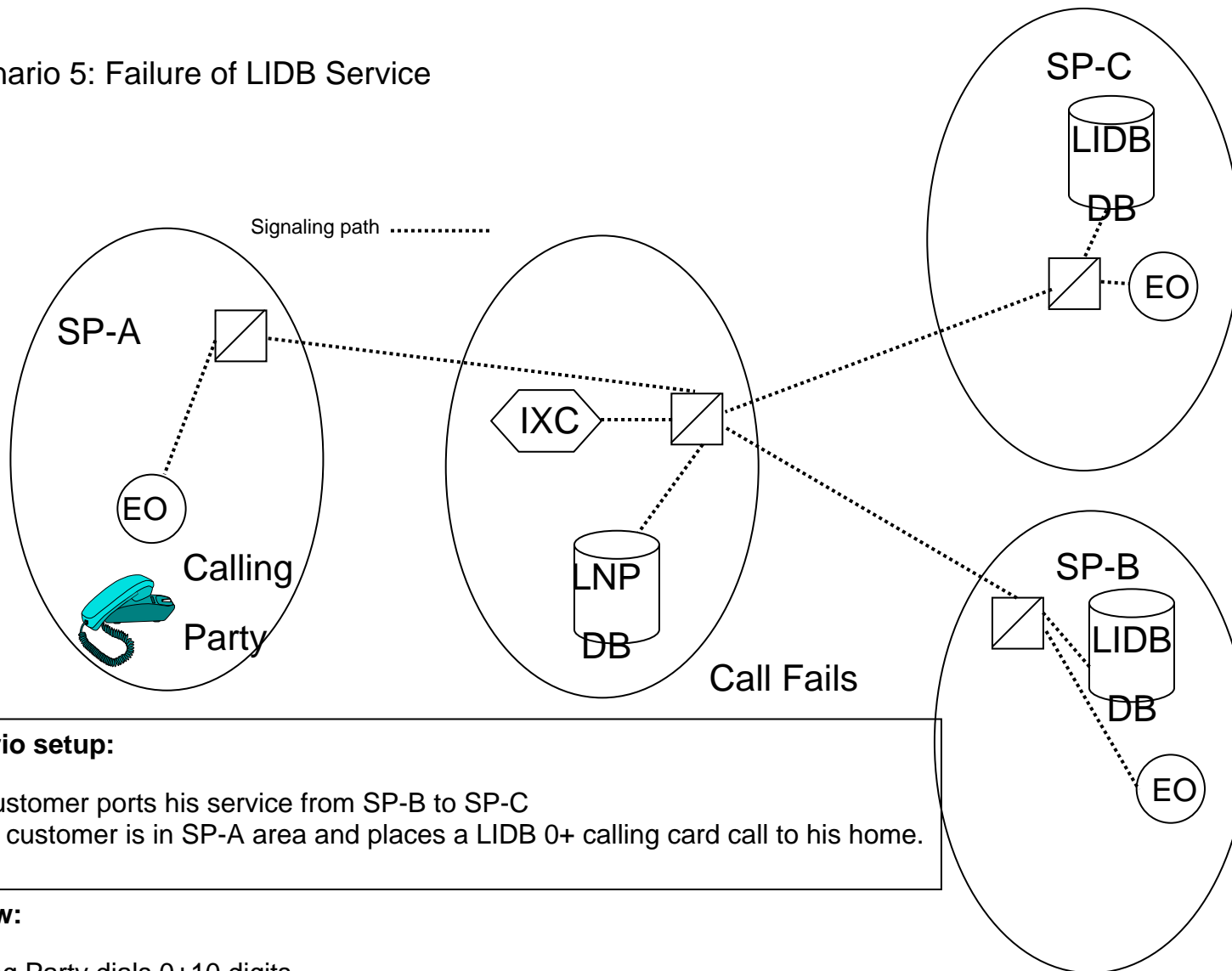
IXC-A launches LNP query as N-1 carrier. CdPN moved to GAP in SS7 message. LRN populated in CdPN of SS7 message.

FCI populated in SS7 message since query has been performed. Call forwarded to IXC-B for termination to SP-B

IXC-B ignores FCI, launches second query on number populated in CdPN (which is now the LRN). Query returns same LRN. LRN moved to GAP in SS7 message. LRN populated in CdPN of SS7 message.

IXC-B terminates call to SP-B.

Scenario 5: Failure of LIDB Service



Call Flow:

- Calling Party dials 0+10 digits
- IXC Transports LIDB query to LNP database to obtain GTT information to route the LIDB query
- The Point code and SSN information is wrong and points the query to SP-B LIDB database
- The LIDB response returns an error because the record for that subscriber is not in the database because it has moved to SP-C LIDB
- Depending on SP-A's response to the LIDB failure, the call may or may not complete

