

NENA Standards For Local Service Provider Interconnection Information Sharing



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Prepared by:

National Emergency Number Association (NENA) ALEC Sub-Committee of the ALEC/PS
Technical Committee

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NENA STANDARDS

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NENA's Technical Committee has developed this document. Recommendations for change to this document may be submitted to:

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1 Executive Overview

1.1 Purpose and Scope of Document

This document sets forth recommended NENA standards for all Local Service Providers involved in providing dial tone to end users.

1.2 Reason to Implement

Industry adoption of the standard will:

- Improve communication and conformity
- Remove barriers across entities
- Ensure reliable 9-1-1 call delivery

1.3 Benefits

How: Use of the standards will provide the basis for agreements between the Local Service Provider and the 9-1-1 Service Provider.

When: Should be used at the time that arrangements are being made between the Local Service Provider and the 9-1-1 Service Provider.

1.4 Operational Impacts Summary

N/A

1.5 Document Terminology

The terms "shall ", "must " and "required" are used throughout this document to indicate required parameters and to differentiate from those parameters that are recommendations. Recommendations are identified by the words "desirable" or "preferably".

1.6 Reason for Issue

This document is issued to serve as guidance for information sharing between Local Service Providers and 9-1-1 Service Providers.

1.7 Reason for Reissue

NENA reserves the right to modify this document. Whenever it is reissued, the reason(s) will be provided in this paragraph.

August 2004 reissue: The document was reformatted into the NENA Technical Committee standard format and word usage was revised to comply with section 1.5 Document Terminology.

1.8 Date Compliance

All systems that are associated with the 9-1-1 process shall be designed and engineered to ensure that no detrimental, or other noticeable impact of any kind, will occur as a result of a date/time change up to 30 years subsequent to the manufacture of the system. This shall include embedded application, computer based or any other type application.

To ensure true compliance the manufacturer shall upon request provide verifiable test results to an industry acceptable test plan such as Telcordia GR-2945 or equivalent.

1.9 Anticipated Timeline

Information sharing between ILECs and ALECs is both an **initial and ongoing requirement** for the provisioning and upgrading of the 9-1-1 system.

1.10 Costs Factors

N/A

1.11 Cost Recovery Considerations

N/A

1.12 Acronyms/Abbreviations

This is not a glossary! See [NENA Master Glossary](#) of 9-1-1 Terminology located on the NENA web site for a complete listing of terms used in NENA documents.

2 Technical Description

2.1 Information to be shared between ILECs and ALECs

2.1.1 The ILEC controlling the 9-1-1 service system **must** provide each ALEC with a detailed description of, but not limited to, the following information:

- 2.1.1.1 Description of 9-1-1 Selective Router service area in a graphical/map format and/or text/list format
- 2.1.1.2 Exchange or NPA-NXX to PSAP trunking arrangements where Selective Routing does not apply
- 2.1.1.3 Geographic boundaries of LEC's rate centers/exchanges, where available

Use of Rate Center Information in ALEC 9-1-1 Service

ALEC assignments of telephone numbers do not depend on the fixed central office boundaries of the past. This breaks some of the assumptions under which E-9-1-1 service was originally designed. As a result, some relationships between the ALEC NXX service area and the E 9-1-1 Selective Routing switch service area must be established. This allows determination of ALEC call delivery to the proper Selective Router that can then deliver the call to the correct PSAP.

The assignment of NXXs for all domestic telephone service providers is done by the NANPA administrator using the Local Exchange Routing Guide (LERG), and in relationship to Rate Center where the NXX number set will be used. Since most 9-1-1 Selective Routers cover a set of Rate Centers, the Rate Center relationship becomes a way to define how an ALEC NXX, the corresponding Rate Center, and the related Selective Router need to work together for 9-1-1 service.

In essence, the Rate Center becomes the "physical boundary" of the ALEC NXX in regard to geographic and Selective Router switch interconnection considerations for 9-1-1 service. See also Attachment A, '9-1-1 and the Local Service Provider - The Call Routing Puzzle', for examples of these relationships.

- 2.1.1.4 The ALEC exchanges associated with each Selective Routing 9-1-1 tandem
- 2.1.1.5 Common Language Location Identification (CLLI) codes (11 character standard) with their associated addresses for the switching and meetpoints in the network
- 2.1.1.6 The PSAPs associated with each Selective Router 9-1-1 tandem
- 2.1.1.7 The MSAG or similar equivalent
- 2.1.1.8 Technical Specifications for network interface
- 2.1.1.9 Technical specifications for database loading and maintenance
- 2.1.1.10 Identification of local procedures and responsibility for assigning default call routing

2.1.2 Recommended Standard for Contact Lists

It is **required** that all local service providers staff a 24 hour / 7 days a week problem resolution center with personnel knowledgeable of 9-1-1. The contact number **shall be** provided to the 9-1-1 Service Provider and PSAPs for their use in requesting assistance for 9-1-1 call problems. Escalation names and numbers for emergency situations for both ALECs and ILECs **shall be** provided.

Administrative level contacts in the ILEC, ALEC and/or database custodian (if different than the ILEC) **shall be** exchanged for 9-1-1 operational purposes. A single point of contact is preferable.

Names, titles, phone numbers, etc. shall be provided for government entities responsible for 9-1-1 systems.

2.1.3 Recommended Standard for Service Restoration

Pre-arranged contingency plans are required with each ILEC/ALEC prior to service being activated.

2.2 Relationship between ALEC service areas and Selective Routing 9-1-1 Tandem service area

The Local Service Provider must relate their NPA-NXXs, rate centers and/or service areas to the appropriate Selective Routers utilizing the information described in Section 1.0.

2.3 Verification of ALEC subscribers information in the ALI database

Database verification between the LSP and the 9-1-1 Service Provider must be accommodated. The method and medium must be negotiated, but will be subject to the NENA Audits/Recommendations section (19) of the NENA Data Standards For Local Exchange Carriers, ALI Service Providers & 9-1-1 Jurisdictions document, NENA 02-011.

2.4 ALI database error correction

It is **required** that ALI database error correction be done by the Local Service Provider (LSP) for their own customer records, unless alternate arrangements have been negotiated with the 9-1-1 Service Provider.

2.5 Notification to PSAPs of new Local Service Provider NXXs

The PSAP must unblock new LSP NXXs in situations where the PSAP uses a PBX or other private switch that would restrict “call-backs” to new NXXs until they are added to the “allowed call” list.

It is **required** that this notification be handled with existing methods by which PBX users are alerted of new NXXs as they are being activated.

New NXXs **shall** be added to contingency plans and reference tools for identification of the appropriate telephone service provider for tracing calls, etc.

2.6 MSAG Ownership and Responsibilities

The MSAG or similar equivalent is the basis for managing the accuracy of selective routing, selective transfer, and the identification of “first responders” (law enforcement, fire, EMS) in the data display provided by E9-1-1 service.

It is desirable that ownership and responsibilities be established in tariffs and/or contracts between government entities and service providers. In the absence of any defined ownership, the committee has **established** the following **standards**:

2.6.1 The government entity **shall** be responsible for:

- Establishment of the MSAG or similar equivalent content, including defining ESNs
- Updates to MSAG or similar equivalent (changes, additions, deletions)

2.6.2 The MSAG or similar equivalent custodian (usually, but not always, the 9-1-1 Service Provider) **shall** be responsible for:

- Operation of the Database Management System
- Processing of information submitted by the government entity
- Storage of the MSAG or similar equivalent data and distribution of copies to authorized users in a mutually agreeable medium and frequency

(Users **shall** be considered authorized when the state regulatory body certifies them as a Local Service Provider, and any required contractual agreements exist.)

2.7 PSAP Contact with Local Service Providers

If the PSAP needs to contact the originating Local Service Provider for emergency purposes (line seizure, line interrupt, a hostage situation, address verification, etc), a 24 hour by 7 day contact point must be determined for the Local Service Provider that controls switching of the originating call.

2.7.1 If the ANI fails, an ESCO code is generated by the Selective Router and is conveyed to the PSAP. The PSAP **must** contact the 9-1-1 Service Provider to determine ownership of the trunk identified by the ESCO code.

2.7.2 If ALI is displayed without Company ID, then two choices are possible:

- The LSP **shall** provide the PSAPs a list of the NXXs assigned to them and the 24 x 7 contact number (see 2.1.2)
- If the carrier’s NXXs are not identified to the PSAP, the PSAP **shall** contact the 9-1-1 Service Provider to determine the proper carrier

2.7.3 If the ALI is incomplete, but the Company ID field is available, **it is preferable that** the PSAP use the Company ID to determine the proper contact number.

2.8 Local Service Provider Operator Handling of Emergency Calls

Local Service Providers **require** 10-digit emergency service telephone numbers for operator handling of emergency calls.

This information should be provided by the Governmental entity responsible for public safety agency administration. They may delegate the distribution to:

- the State entity;
- the County or service system coordinator;
- the 9-1-1 Service Provider; or
- an independent agency.

The information can **preferably** be shared electronically (Internet) or by some other timely means.

3 References

See also related NENA Data Standards 02-010 and 02-011 concerning data formatting and management.

Examples of Service Questionnaires, Service Documentation Spreadsheets, and other information sharing techniques in use can be obtained from the NENA Resource Center, either via the NENA WEB site, or by contacting the NENA national office at 800-332-3911.

4 Exhibits

Exhibit 4.1: 9-1-1 and the Local Service Provider – The Call Routing Puzzle

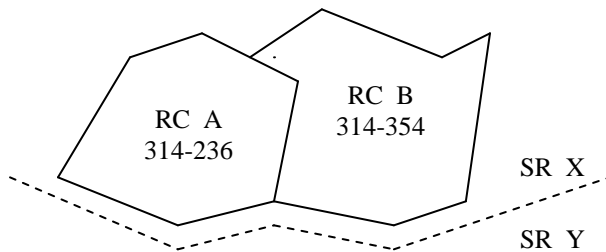
4.1 9-1-1 and the Local Service Provider – The Call Routing Puzzle

The following does not represent NENA recommended approaches, and is only a description of variations that may exist, and their impacts.

Rate Centers are discussed from the context of Rate Center territory, which corresponds to the fixed boundary geographic area associated with the literal Rate Center, in which the same rates apply.

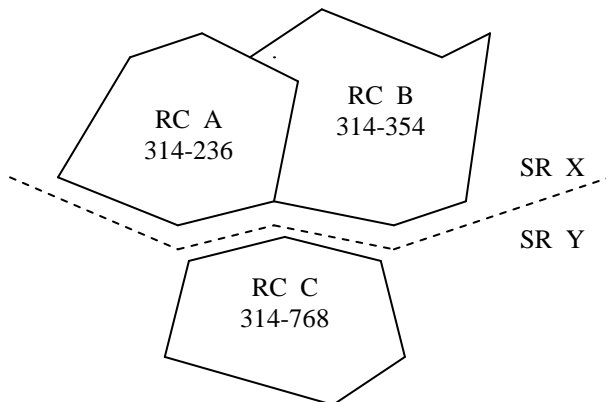
The application of Local Service Provider (LSP) NPA-NXX's to Rate Center and associated service areas involves certain specific considerations and 9-1-1 system arrangements to allow for proper 9-1-1 service. Handling differs depending on how the telephone numbers for each NXX are applied to customer service.

Scenario 1 – If all NXXs for a given LSP switch are applied within Rate Center territories that lie within a single 9-1-1 Selective Router switch service area, the 9-1-1 systems work as expected. (Rate Center A or Rate Center B)



314-236 and 314-354 calls to 9-1-1 sent via one trunk group to SR X

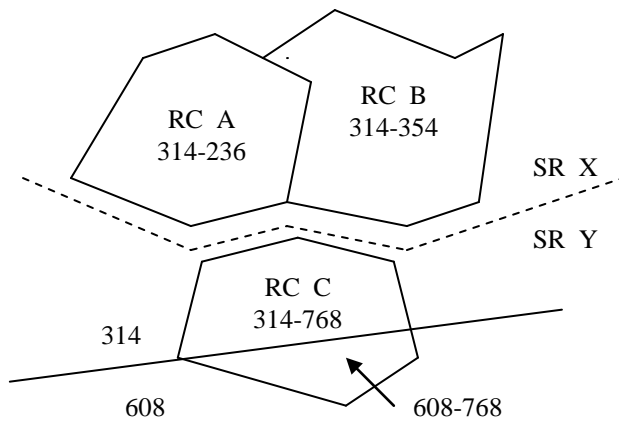
Scenario 2 – If the NXX's for an LSP switch are used in Rate Center areas on both sides of the Selective Router (SR) boundary (dotted line), but a given NXX does NOT overlap into two SR areas, then the current 9-1-1 process requires separate trunk groups from the LSP switch to each SR switch involved. The LSP switch must cause each trunk group to handle calls from NXXs/Rate Centers applicable to the related SR service area. (Rate Center B and Rate Center C)



314-236 and 314-354 calls to 9-1-1 sent via one trunk group to SR X

314-768 calls sent via another trunk group to SR Y

Area Code Splits – If a Rate Center territory is in different NPAs, or if one or more COs become split internally between NPAs, separate trunk groups must be established for each unique NPA/SR set, under current E9-1-1 switch translations limitations.



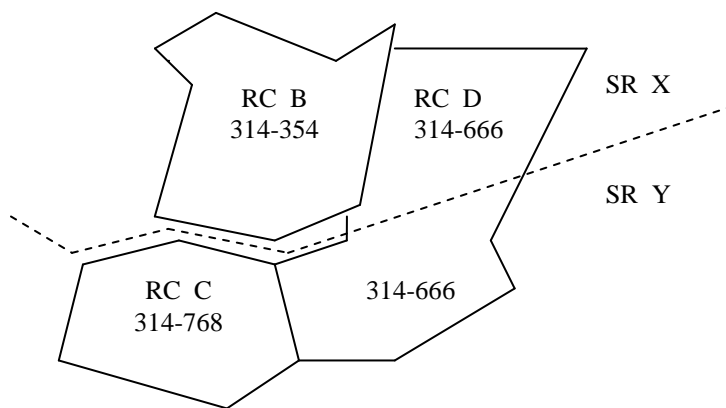
314-236 and 314-354 calls sent via one trunk group to SR X

314-768 calls sent via another trunk group to SR Y

608-768 calls sent via a third trunk group to SR Y

Scenario 3 – Not recommended due to Technical Constraints

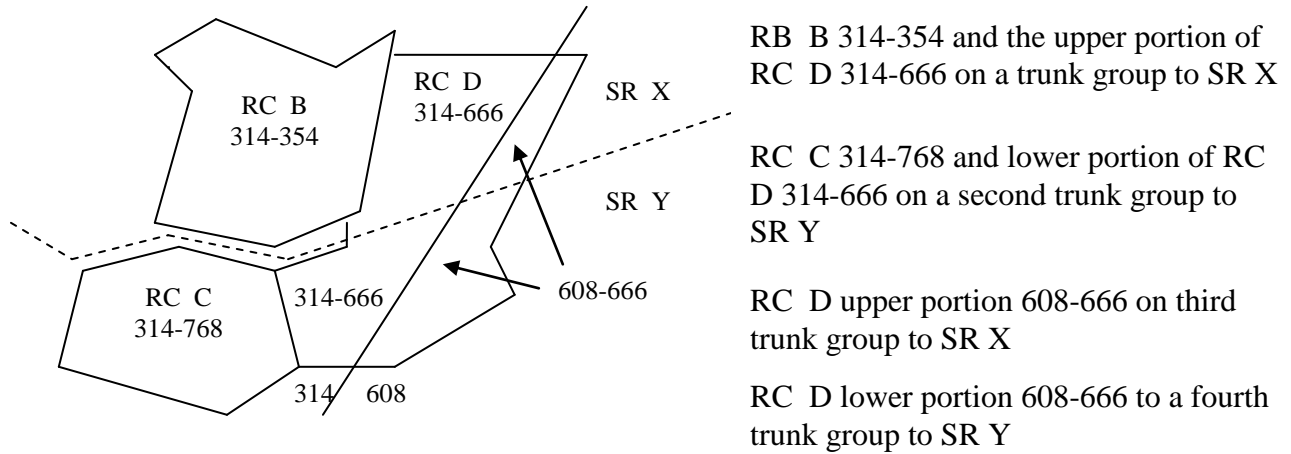
Before 1996, 9-1-1 systems architecture was based on fixed exchange boundaries, with dedicated NXXs, and trunked by CO to a single Selective Router for call routing control. The basic 9-1-1 computer software and data base process designs were based on this assumption. With the new possibility of “flexible” LSP switch territory, these assumptions can be broken. If the LSP applies a single NXX across the SR boundary, either in multiple Rate Centers or in a single Rate Center that overlaps the SR boundary, then changes to software and to data base processes are required in the 9-1-1 systems to support this. This approach is not supported nation-wide, and requires local negotiation between the LSP and the 9-1-1 service providing Company. (RC B using 314-354, RC C using 314-768 and in RC D with 314-666 applied in both SRs)



Rate Center area B calls and upper portion of RC D sent via one trunk group to SR X

RC C and lower portion of RC D calls sent via another trunk group to SR Y

Area Code Splits – In the following example, the NPA boundary crosses the Selective Router boundary for the Rate Center areas involved. Since there are four unique NPA and SR sets, four trunk groups would be required under current 9-1-1 design considerations.



Since NXXs are applied across Selective Router boundaries, the changes to software and/or data base processes noted in Scenario 3 would also apply to this example.

NOTE: Planning for Area Code splits MUST take 9-1-1 service into account due to the data and call routing impacts.