

OCTOBER 10, 2007

**NORTH AMERICAN NUMBERING COUNCIL REPORT
TO THE FCC WIRELINE COMPETITION BUREAU
STAFF**

SUBJECT: FCC RM-11299 ACTION ITEMS

BACKGROUND

North American Numbering Council (NANC) Chairman Tom Koutsky was contacted by staff in the Pricing Policy Division of the FCC Wireline Competition Bureau requesting that the NANC provide WCB Staff certain data and information related to the use of the NPAC database by providers. This request was made in connection with FCC RM-11299, a rulemaking petition filed by BellSouth that proposes to change the manner in which the industry funds the Number Portability Administration Center (NPAC), from the current approach based on telecommunications revenue to one in which the initiator of an NPAC transaction would pay a fee for each transaction.

On August 29, 2007, NANC Chairman Tom Koutsky convened a conference call with FCC WCB Staff representatives and the LNPA WG Co-Chairs to discuss and finalize the WCB Staff data request. WCB Staff asked about the size of the NPAC database for ported and pooled numbers, broken down by industry segment. WCB staff also requested the NANC to research viable alternatives to modifying Signaling System 7 Destination Point Code (SS7 DPC) data in ported and pooled number records in the NPAC for activities such as a service provider change to their Line Information Database (LIDB) or Calling Name (CNAM) database provider. As a result, the following action items were assigned to the LNPA WG, to be included in a report to be delivered to the NANC prior to their October 10, 2007 meeting.

The assigned action items were as follows:

ACTION ITEM 1:

By industry segment, i.e., Wireline ILECs, Wireline CLECs, and Wireless Providers, identify the total quantity of numbers currently assigned to each industry segment in the U.S.

ACTION ITEM 2:

By industry segment, i.e., Wireline ILECs, Wireline CLECs, and Wireless Providers, identify the quantity of ported numbers currently in the U.S. NPAC databases.

ACTION ITEM 3:

By industry segment, i.e., Wireline ILECs, Wireline CLECs, and Wireless Providers, identify the quantity of pooled numbers currently in the U.S. NPAC databases.

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ACTION ITEM 4:

For the following 5 services that potentially contain Signaling System 7 (SS7) Destination Point Code (DPC) and Subsystem Number (SSN) data in ported and pooled number records, analyze and identify if any viable alternatives exist to modifying these data fields when changes to the routing of these services' SS7 Transaction Capabilities Application Part (TCAP) messages should become necessary. These 5 services potentially containing DPC and SSN data in ported and pooled number records are as follows:

1. CLASS
2. Line Information Database (LIDB)
3. Calling Name (CNAM)
4. Inter-switch Voice Messaging Message Waiting Indicator (ISVM MWI)
5. Wireless Short Message Service Center (WSMSC)

ACTION ITEM RESPONSES

ACTION ITEM 1:

By industry segment, i.e., Wireline ILECs, Wireline CLECs, and Wireless Providers, identify the total quantity of numbers currently assigned to each industry segment in the U.S.

Wireline ILEC:	599,501,000
Wireline CLEC:	312,448,000
Wireless:	<u>373,773,000</u>
TOTAL:	1,285,722,000

Data Source: Numbering Resource Utilization/Forecast Reports data filed with NeuStar, Inc. as of December 31, 2006 (97% of NXXs reported), as reported in the August 2007 FCC Wireline Competition Bureau Industry Analysis and Technology Division report on Numbering Resource Utilization in the United States (reference Table 1 on page 14).

Note 1: The figures above represent quantities in the "Total" category from the above-referenced Table 1. The "Total" category is a summation of the "Assigned," "Intermediate," "Reserved," "Aging," "Administrative," and "Available" categories in Table 1.

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Note 2: The WCB Staff initially requested that, if possible, Cable providers be considered a separate industry segment for the purpose of identifying numbering resources. All data sources identified by the LNPA WG currently include Cable provider data within the CLEC category. As a result, separate numbering resource quantities could not be obtained for Cable providers and are included in the CLEC counts in this report.

ACTION ITEM 2:

By industry segment, i.e., Wireline ILECs, Wireline CLECs, and Wireless Providers, identify the quantity of ported numbers currently in the U.S. NPAC databases.

Wireline ILEC:	7,833,697
Wireline CLEC:	71,219,075
Wireless:	<u>93,571,756</u>
TOTAL:	172,624,528

Data Sources: 1. August 2007 Number Portability Administration Center (NPAC) data for Telephone Number (TN) record counts by Operating Company Number (OCN).

2. Telcordia LERG Routing Guide for Operating Company Number (OCN) categorizations by provider type, e.g. ILEC, CLEC.

Note 1: The quantity of ported numbers includes both inter-provider and intra-provider ported numbers.

Note 2: The August 2007 NPAC data used to obtain these quantities identified the ported numbers as being associated with either a wireline provider or a wireless provider. A further breakdown of the wireline data, i.e. Wireline ILEC, Wireline CLEC, Wireline Cable, is not available via the NPAC. In order to associate these wireline ported number quantities as being either Wireline ILEC or Wireline CLEC, a further analysis of the applicable Operating Company Number (OCN) was necessary to identify a provider as either an ILEC or a CLEC. The WCB Staff initially requested that, if possible, Cable providers be considered a separate industry segment for the purpose of identifying ported number counts. All data sources identified by the LNPA WG currently include Cable provider data within the CLEC category. As a result, separate ported number counts

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could not be obtained for Cable providers and are included in the CLEC counts in this report.

Note 3: The Wireline ILEC category includes all service providers with an Operating Company Number (OCN) designation of ILEC, not just Regional Bell Operating Companies (RBOCs).

ACTION ITEM 3:

By industry segment, i.e., Wireline ILECs, Wireline CLECs, and Wireless Providers, identify the quantity of pooled numbers currently in the U.S. NPAC databases.

Wireline ILEC:	3,992,192
Wireline CLEC:	67,708,902
Wireless:	<u>59,179,540</u>
TOTAL:	130,880,634

Data Sources: 1. August 2007 Number Portability Administration Center (NPAC) data for Telephone Number (TN) record counts by Operating Company Number (OCN).

2. Telcordia LERG Routing Guide for Operating Company Number (OCN) categorizations by provider type, e.g. ILEC, CLEC.

Note 1: The August 2007 NPAC data used to obtain these quantities identified the pooled numbers as being associated with either a wireline provider or a wireless provider. A further breakdown of the wireline data, i.e. Wireline ILEC, Wireline CLEC, Wireline Cable, is not available via the NPAC. In order to associate these wireline pooled number quantities as being either Wireline ILEC or Wireline CLEC, a further analysis of the applicable Operating Company Number (OCN) was necessary to identify a provider as either an ILEC or a CLEC. The WCB Staff initially requested that, if possible, Cable providers be considered a separate industry segment for the purpose of identifying pooled number counts. All data sources identified by the LNPA WG currently include Cable provider data within the CLEC category. As a result, separate pooled number counts could not be obtained for Cable providers and are included in the CLEC counts in this report.

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Note 2: The Wireline ILEC category includes all service providers with an Operating Company Number (OCN) designation of ILEC, not just Regional Bell Operating Companies (RBOCs).

ACTION ITEM 4:

For the following 5 services that potentially contain Signaling System 7 (SS7) Destination Point Code (DPC) and Subsystem Number (SSN) data in ported and pooled number records, analyze and identify if any viable alternatives exist to modifying these data fields when changes to the routing of these services' SS7 Transaction Capabilities Application Part (TCAP) messages should become necessary. These 5 services potentially containing DPC and SSN data in ported and pooled number records are as follows:

1. CLASS
2. Line Information Database (LIDB)
3. Calling Name (CNAM)
4. Inter-switch Voice Messaging Message Waiting Indicator (ISVM MWI)
5. Wireless Short Message Service Center (WSMSC)

As discussed below, after performing a detailed analysis collectively and individually within participant companies, the LNPA WG did not identify any existing reliable and viable alternatives to modifying the NPAC with regard to these data fields when a provider wishes to change the routing of these 5 services' SS7 Transaction Capabilities Application Part (TCAP) messages for a number that is in the NPAC database.

Prior to the implementation of Local Number Portability (LNP) in 1997, the non-call-associated Signaling System 7 Transaction Capabilities Application Part (SS7 TCAP) messages that support these 5 services were routed based on the NPA-NXX of the target telephone number. Because entire NPA-NXXs could be associated with a single specific provider, switch, and database, these NPA-NXXs could be associated with unique DPC/SSN data in the translations of Signal Transfer Points (STPs) for proper routing of the applicable service's TCAP message. For example, the TCAP messages in support of CLASS services such as Auto Recall and Auto Callback (*68, *69) were routed to the target NPA-NXX's serving switch in order to check the busy/idle status of the target line based on the target number. When that line became idle, the initiator of the service was signaled that a call could be completed. The TCAP messages in support of LIDB and CNAM were routed to the LIDB or CNAM database that served the target NPA-NXX so that alternate billing services or calling name identification, respectively, could be

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engaged for the target number. The messages in support of Wireless Short Message Service (WSMS) were routed to the appropriate wireless provider's message center based on the target number's NPA-NXX for final routing of the text message to the target wireless telephone number.

With the implementation of LNP in 1997, and the subsequent implementation of Telephone Number Pooling (TNP) in 2002, routing of these TCAP messages could no longer be relied upon at the NPA-NXX level. Individual 10-digit telephone numbers within the same NPA-NXX could now be served by different service providers, switches, and databases. As a result, DPC/SSN data for the routing of these TCAP messages in support of the 5 services were associated at the 10-digit level in ported and pooled number records in the Number Portability Administration Center (NPAC) and broadcast to subtending routing databases as numbers were ported or pooled. These TCAP messages are now routed to an applicable routing database (e.g., Service Control Point [SCP]) to determine if a 10-digit match on the target number can be found (meaning that the target number is ported or pooled). If found, the appropriate DPC/SSN data stored in the ported or pooled number record for the applicable service, e.g. CLASS, LIDB, is used to route the associated TCAP message to the proper destination. As providers port in or pool in numbers, they typically associate the DPC of their appropriate ingress SS7 signaling gateway (e.g. for CLASS, ISVM MWI) or database provider's ingress gateway (e.g. for LIDB, CNAM) in their ported and pooled number records in the NPAC for other providers to route a TCAP message in support of one of these services. If a 10-digit record is not found in the routing database (meaning that the number is not ported or pooled), the TCAP message can be default routed at the NPA-NXX level.

Prior to its September 2007 meeting, the LNPA WG participants were assigned an action item to discuss ACTION ITEM 4 internally with SS7 signaling experts within their respective companies and come prepared to discuss ACTION ITEM 4 at the September LNPA WG meeting. In addition, members of the Alliance for Telecommunications Industry Solutions (ATIS) Network Interconnection Interoperability Forum (NIIF) Network Interoperability Committee (NIOC) were invited to participate in the LNPA WG discussion at the September meeting. The ATIS NIIF NIOC members are industry-recognized SS7 subject matter experts and a number of them participated during the LNPA WG discussion.

During the LNPA WG analysis and discussion of ACTION ITEM 4, the only alternative identified as potentially viable to modifying these DPC/SSN data fields in the NPAC, when changes to the routing of these services' SS7 TCAP messages should become

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necessary, was redirection of the incoming TCAP message at the old ingress gateway to the DPC of the new ingress gateway.

LIDB and CNAM

The LNPA WG first analyzed LIDB and CNAM services in the context of a potential redirect scenario. These 2 services were grouped together because the DPC data in the NPAC associated with these services typically identifies an ingress gateway of the provider of the database service. The provider of the database service may or may not be the carrier that serves the target telephone number. A modification of this DPC data in the NPAC for a service provider's ported and pooled number records could be necessitated by that service provider changing their chosen LIDB or CNAM database provider. Although one LIDB/CNAM database provider did respond that it was technically feasible to redirect the incoming TCAP query at their ingress SS7 gateway to the DPC of the new database provider's ingress gateway, the majority of responding LNPA WG participants, after consulting with their respective SS7 experts, concluded that redirection of the incoming TCAP queries for these database services was not a viable alternative to modifying the applicable DPC data in the NPAC. Reasons cited were:

1. Questionable incentive for a database provider to reroute incoming TCAP queries for another database provider's customer,
2. The rerouting scenario keeps the former database provider's SS7 network in the routing path for the TCAP query,
3. Possible impacts to the quality of the service for affected customers,
4. Providers' systems and networks rely on the real-time update of TCAP message routing data afforded by the NPAC and LNP architecture,
5. Administrative effort.

Conclusion: Redirection of the incoming TCAP query was not deemed a viable alternative to modifying affected DPC data in the NPAC for LIDB and CNAM.

WIRELESS SHORT MESSAGE SERVICE CENTER (WSMSC)

The DPC/SSN data in ported and pooled number records in the NPAC for WSMSC can be used for routing wireless short text messages to wireless handsets with ported or pooled numbers. For a number of the reasons cited above for

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LIDB and CNAM, the LNPA WG also concluded that redirection of these messages from one WSMSC to another was not a viable alternative to modifying the data in the NPAC.

Conclusion: Redirection of the incoming WSMSC messages was not deemed a viable alternative to modifying affected DPC data in the NPAC for this service.

CLASS AND ISVM MWI

CLASS and Inter-switch Voice Messaging Message Waiting Indicator (ISVM MWI) services were looked at separately because the final destination of the TCAP messages associated with these services is a service provider's switch and not a database. The CLASS and ISVM MWI DPC data that a provider places in the NPAC for their ported and pooled numbers that is broadcast to other service providers is typically that of their applicable ingress SS7 gateway so that other providers can route the TCAP messages into their network.

LNPA WG participants were given an action item to analyze these two services separately from the other three to determine if redirection of the incoming TCAP messages in support of these services at their ingress gateway was a viable alternative to modifying the data for their ported and pooled numbers in the NPAC, should that service provider choose to change the gateway to which they wish other providers to route.

Again, for a number of similar reasons cited above for LIDB and CNAM, the LNPA WG concluded that redirection of these messages from one ingress gateway to another was not a viable alternative to modifying the data in the NPAC.

Conclusion: Redirection of the incoming TCAP query was not deemed a viable alternative to modifying affected DPC data in the NPAC for CLASS and ISVM MWI.

OVERALL CONCLUSION FOR ACTION ITEM 4

After performing a detailed analysis collectively and individually within participant companies, the LNPA WG did not identify any existing reliable and viable alternatives to modifying in the NPAC these Destination Point Code (DPC) data fields when changes to the routing of these 5 services' SS7 Transaction Capabilities Application Part (TCAP) messages should become necessary.