**Origination Date:** 11/06/18

**Originator:** iconectiv

### Change Order Number: NANC 533

**Description:** Audits with Activation Timestamp Range

**Functional Backwards Compatible:** Yes

**IMPACT/CHANGE ASSESSMENT**

|  |  |  |
| --- | --- | --- |
| DOC | FRS | IIS |
| Y | Y |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CMIP | GDMO | ASN.1 | NPAC | SOA | LSMS |
| Y | N | Y | N | N |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| XML | XIS | XSD | NPAC | SOA | LSMS |
| Y | N | Y | N | N |

**Business Need**

Audits are performed to determine if LSMSs have the same routing data for ported numbers or pooled blocks as the NPAC SMS has. Based on LSMS responses to audit based NPAC SMS queries for ported numbers and/or blocks, the NPAC SMS can determine if each LSMS view is discrepant with the NPAC SMS view, and if so, send broadcasts to the discrepant LSMSs to bring the views into alignment (the NPAC SMS view is considered the master or correct view).

When a SOA, NPAC LTI user, or NPAC Admin GUI user makes an audit request, the request identifies the following:

* Audit Name to uniquely identify the audit; required
* TN Range to be audited (single TN can be audited and identifies same TN for start and end of the range); required
* LSMSs to be audited (one LSMS or all LSMSs); required
* Activation Time Range; optional (only audit those TNs in the TN Range whose activation timestamp falls within the Activation Time Range specified here).
* Audit Attribute List – either all attributes (all DPCs and LRN) are audited, or a specific list of DPCs and/or LRN are identified to be audited; required

If an audit request includes the activation time range in addition to a TN Range, the NPAC SMS queries its database and LSMSs for SVs associated with the requested TN Range and Activation Time Range and expects LSMSs to return the requested SV records (which could be empty if no SVs match the query request). But, observations made during the NPAC transition indicated that many LSMSs return a processing failure error when the NPAC query includes the activation time range. Many LSMSs (and routing networks) will not get corrected if they are discrepant with the NPAC SMS and do not successfully respond to the NPAC SV query.

Note, it was also observed that the majority of audit requests are for single TNs and there is no additional benefit in adding an Activation Time Range if the TN(s) being audited is known.

Two potential ways of correcting this issue are as follows:

1. Make changes to the NPAC SMS to ignore the activation time range if it is specified on an Audit Request. In the NPAC SMS query to LSMSs and when NPAC SMS queries its database for the requested TNs, the query will not include the activation time range. This would require no changes to Local Systems.
2. Sunset the capability to specify an activation time range on Audit requests. This would impact the GDMO/ASN.1 and XML/XSD, having an impact on NPAC, SOAs, and potentially LSMSs, and require a recompile.

This change order discusses changes associated with NPAC SMS ignoring the activation time range when it appears in an audit request.

**Description of Change:**

**FRS changes**:

Update various FRS requirements in **Section 8** that mention the activation time range.

R8‑3 Service Providers Specify Audit Scope

NPAC SMS shall allow Service Providers to specify the scope of an audit by specifying one or more of the following parameters:

1. Specific Service provider network **or** ALL Service Providers networks
2. Specify an activation Date/Time stamp range, i.e., only audit records activated between a specific time window - the NPAC SMS will ignore this parameter if specified and behave as if the activation date/time stamp range was not in the request.
3. Full audit for all LNP attributes **or** a partial audit where the Service Provider can specify one or more of the following LNP attributes:
4. LIDB data
5. CLASS data
6. LRN data
7. CNAM data
8. ISVM data
9. WSMSC data (only Service Provider Local SMSs that support this attribute will be audited on this attribute)

Default: Full audit

Note: Partial audits apply only to the CMIP interface. Full audits apply to both the CMIP interface and the XML XML interface.

R8-9 NPAC Personnel Specify Audit Scope

NPAC SMS shall allow NPAC SMS Personnel to specify the scope of an audit by specifying one or more of the following parameters:

1. Specific Service Provider network **or** ALL Service Providers networks.

* Specify an activation Date/Time stamp range, i.e., only audit records activated between a specific time window - the NPAC SMS will ignore this parameter if specified and behave as if the activation date/time stamp range was not in the request.

1. Full audit for all LNP attributes **or** a partial audit where the Service Provider can specify one or more of the following LNP attributes:
2. LIDB data
3. CLASS data
4. LRN data
5. CNAM data
6. ISVM data
7. WSMSC data (only Service Provider Local SMSs that support this attribute will be audited on this attribute)

**Default**: Full audit

**R8-16.1 Flow of Audit Execution**

NPAC SMS shall send the query resulting from the audit request to the local Service Providers' networks that are accepting Subscription Version data downloads for the given NPA-NXX via the NPAC SMS-to-Local SMS interface, as described in the NPAC SMS Interoperable Interface Specification. If the audit request contained an activation date/time stamp range, the NPAC will ignore it and not send the activation date/time stamp range in the query request to LSMSs.

**RR8-6 Audit Processing for All Subscription Versions in a Number Pooling Environment**

NPAC SMS shall process an audit request of an Active-Like **Subscription Version(s),** by performing the following steps: (Previously A-2)

* Validate that the audit request is valid (existing FRS functionality).
* Validate that the Block associated with the TN contained in the Subscription Version(s), exists in the NPAC SMS.
* Send queries of Block(s) **AND** TN Range, to Local SMSs that are accepting downloads for the given NPA-NXX.
* Process Local SMS responses for the Block(s) by doing a comparison. If a discrepancy exists, the NPAC SMS data is considered “correct”, and a correction should be sent to the Local SMS.
* Process Local SMS responses for Subscription Versions, as follows:

LSPP and LISP – Use existing audit functionality

POOL – “No Data” is correct response, SVs for other LNP Types need to be deleted.

* Send audit results and notification of discrepancies, back to requesting SOA, only for the TN Range that was requested, even if other TNs were affected because of a Local SMS. The existing notification report will be unchanged, and will not contain block information. In cases where a Local SMS erroneously contained a Number Pool Block, the NPAC SMS shall send a Number Pool Block delete to the Local SMS, but shall not report any discrepancy back to the requesting SOA for this Local SMS if this was the only discrepancy. The NPAC SMS will report to the SOA the discrepancies with subscription version identifiers. Thus, if a numberPoolBlock object is in error, the discrepancy will be reported as all TNs within the audit range. Subscription version discrepancies will be reported as usual.
* Suppress status change and attribute change notifications, for Subscription Versions, to the Block Holder SOA.
* Send status change and attribute change notifications, for Blocks, to the Block Holder SOA when the SOA Origination is TRUE, and only when an audit correction causes the status and/or Failed SP List to be updated to different values.

[snip]

**RR8-11 Audit for Pooled Numbers and Block to Local SMS**

NPAC SMS shall send a query for Subscription Version(s), resulting from the TN Range audit request for Subscription Version(s) with LNP Type of POOL, and a query for the corresponding Block of the Subscription Version(s) with LNP Type of POOL, to a Local SMS that is accepting Block and Subscription Version data download for the given NPA-NXX via the NPAC SMS-to-Local SMS Interface. (Previously A-40)

[snip]

**EFD Changes:**

Update Flow **B.2.1** on SOA Initiated Audits, Step 1, Flow **B2.4** on NPAC Initiated Audit (prelude to Step 1), Flow **B.2.7.1** SOA Initiated Audit involving Number Pool Blocks, Step 1, and Flow **B.2.8** on NPAC Initiated Audit involving Number Pool Blocks (prelude to Step 1).

1. The SOA sends an M-CREATE request to the NPAC SMS, requesting an audit. For the XML interface, ACRQ – AuditCreateRequest. The SOA must specify the following attributes in the request:

subscriptionAuditName – unique English audit name  
subscriptionAuditRequestingSP - the service provider requesting the audit  
subscriptionAuditServiceProvIdRange - which service provider or all service providers for audit  
subscriptionAuditTN-Range - TNs to be audited. If only a single TN is to be audited, specify the ending TN station equal to the starting TN station.

If these attributes are not specified, then the create will fail with a missingAttributesValue error. The SOA may also specify the following attributes in the request:

subscriptionAuditAttributeList - subscription version attributes to be audited  
subscriptionAuditTN-ActivationRange - time range of activation for subscription versions to be audited (the Activation time range will be ignored if specified and will not be used when querying the NPAC SMS database or LSMSs for subscription versions).

The subscriptionAuditId and the subscriptionAuditStatus will be determined by the NPAC SMS. If any values are deemed invalid, an invalidArgumentValue error will be returned. Once the NPAC SMS creates the audit request object, it sends an M-CREATE response back to the SOA that initiated the request.

Make the same changes as identified above for the following Audit Flows:

* **B2.4** on NPAC Initiated Audit (prelude to Step 1),
* **B.2.7.1** on SOA Initiated Audit involving Number Pool Blocks, Step 1,
* **B.2.8** on NPAC Initiated Audit involving Number Pool Blocks (prelude to Step 1)
* **B.2.9** on SOA Initiated Audit for a Pseudo LRN Subscription Version, Step 1

**GDMO Changes**:

Changes to the behavior of the LNP Subscription Audit Managed Object:

[snip]

subscriptionAuditBehavior BEHAVIOUR

DEFINED AS !

All attributes must be specified upon create with the exception

of the subscriptionAuditTN-ActivationRange~~, if an audit is~~

~~not being performed on an activation date range~~. If the

subscriptionAuditAttributeList is not specified then a full

audit is assumed. If the subscriptionAuditTN-ActivationRange is

specified ~~then an audit of all TNs in the range specified in~~

~~subscriptionAuditTN-Range will be audited~~the Activation time

range will be ignored and will not be used when querying the NPAC

SMS and querying LSMSs for subscription versions. The

serviceAuditId is determined by the NPAC SMS.

[snip]

Changes to the behavior of the LNP Subscription Audit TN Activation Range attribute:

-- 57.0 LNP Subscription Audit TN Activation Range

subscriptionAuditTN-ActivationRange ATTRIBUTE

WITH ATTRIBUTE SYNTAX LNP-ASN1.AuditTN-ActivationRange;

MATCHES FOR EQUALITY;

BEHAVIOUR subscriptionAuditTN-ActivationRangeBehavior;

REGISTERED AS {LNP-OIDS.lnp-attribute 57};

subscriptionAuditTN-ActivationRangeBehavior BEHAVIOUR

DEFINED AS !

This attribute is used to specify the activation date and time

range for which TNs should be audited in the subscription audit.

The Activation time range will be ignored if specified and will not

be used when querying the NPAC SMS and querying LSMSs for

subscription versions.

!;

**Changes to the XIS:**

Update Audit Create Request from SOA, SV and Block Query

### 2.9.6 QueryLsmsNpbRequest

The QueryLsmsNpbRequest is sent from the NPAC to the LSMS when the NPAC is performing an audit. In processing this message, LSMS must support the following query expressions for Number Pool Blocks:

| **Operation** | **Direction** | **Operands** | **Parameters** |
| --- | --- | --- | --- |
| QueryLsmsNpbRequest | NPAC to LSMS | <=  >=  =  AND | block\_dash\_x  svb\_activation\_timestamp |

Example:

(block\_dash\_x = '1111113' AND

(svb\_activation\_timestamp >= '2012-09-28T15:00:00Z' AND

svb\_activation\_timestamp <= '2012-09-28T19:00:00Z'))"

The svb\_activation\_timestamp parameter will no longer be used nor sent to the LSMS in an audit related Number Pool Block Query Request.

### 2.9.7 QueryLsmsSvRequest

The QueryLsmsSvRequest is sent from the NPAC to the LSMS when the NPAC is performing an audit. In processing this message, the LSMS must support the following query expression for SVs:

| **Operation** | **Direction** | **Operands** | **Parameters** |
| --- | --- | --- | --- |
| QueryLsmsSvRequest | NPAC to LSMS | <=  >=  =  AND | sv\_tn  svb\_activation\_timestamp |

Example:

((sv\_tn >= '1111119000' AND sv\_tn <= '1111119049') AND

(svb\_activation\_timestamp >= '2012-09-28T15:00:00Z' AND

svb\_activation\_timestamp <= '2012-09-28T19:00:00Z'))

The svb\_activation\_timestamp parameter will no longer be used nor sent to the LSMS in an audit related Number Pool Block Query Request.

#### **5.5.3.1 AuditCreateRequest Parameters**

| Parameter | Description |
| --- | --- |
| audit\_name | This required field specifies the name of the audit |
| tn\_range | This required field specifies the TN range to be audited. Only a contiguous range of numbers can be specified. The range is specified as a starting number and an ending station (station is the last 4 digits of the phone number). Therefore, the maximum number of TNs to be audited is 10,000. |
| audit\_activation\_range | This optional field specifies the TN activation date/time range to be audited. The NPAC will find all TNs that were activated during the specified time range, and perform an audit. The audit\_activation\_range will be ignored if specified and will not be used when querying the NPAC SMS database or LSMSs for subscription versions to perform an audit. |
| audit\_spid\_range | This required field specifies the service providers to be audited. It is a choice of two possible elements. Values include:   * audit\_all\_service\_providers – audit all service providers * audit\_sp\_name\_or\_id – audit only a single spid, identified by either sp\_id or Service Provider Name. |

### 5.8.21 QueryLsmsSvRequest

The QueryLsmsSvRequest message is sent from the NPAC to an LSMS to query subscription versions that are part of an audit.

#### 5.8.21.1 QueryLsmsSvRequest Parameters

Refer to section 2.9.7 for details on the query expression for the QueryLsmsSvRequest. Note, the svb\_activation\_timestamp parameter will no longer be used nor sent to the LSMS in an audit related Subscription Version Query Request.

### 5.8.22 QueryLsmsNpbRequest

The QueryLsmsNpbRequest message is sent from the NPAC to an LSMS to query number pooled blocks that are part of an audit.

#### 5.8.22.1 QueryLsmsNpbRequest Parameters

Refer to section 2.9.6 for details on the query expression for the QueryLsmsNpbRequest. Note, the svb\_activation\_timestamp parameter will no longer be used nor sent to the LSMS in an audit related Number Pool Block Query Request.