**Origination Date:** 07/11/17

**Originator:** iconectiv

### Change Order Number: NANC 498

**Description:** Muliple Associations

**Functional Backwards Compatible:** TBD

**IMPACT/CHANGE ASSESSMENT**

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| CMIP | GDMO | ASN.1 | **Neustar NPAC** | iconectiv NPAC | SOA | LSMS |
| Y | N | N | Y | TBD | TBD |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| XML | XIS | XSD | **Neustar NPAC** | iconectiv NPAC | SOA | LSMS |
| N | N | N | N | N | N |

**Business Need**

iconectiv proposes changes to the FRS, IIS, and GDMO to clarify and document the behavior for multiple simultaneous CMIP associations for a given SPID/system type (system type is SOA or LSMS), particularly with regard to recovery. The IIS currently contains this statement in IIS Section 5.3.4: “one association should be established for recovery and no other associations should be established in normal mode until recovery is complete”. iconectiv believes that additional details of the NPAC behavior around this statement should be provided in the IIS/GDMO and requirements updates to reflect the intent of the existing IIS statement should be added to the FRS.

**Description of Change:**

Changes detailed below.

# FRS Changes:

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6.7 Recovery

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Add the following new requirements:

**Req. 1 Accept Attempt to Establish Only Association, or to Establish an Association When Association Functions on an Existing Association Intersect**

NPAC SMS shall accept the bind request, and will abort any previous association(s) using the same association function(s), if a service provider using a SOA or Local SMS attempts to establish an association with NPAC SMS in normal mode or recovery mode, and no other association exists for the same service provider and local system or the only associations that exist for the same service provider and local system have intersecting association functions. This requirement applies for the CMIP interface only.

**Req. 2 Abort Attempt to Establish an Association in Recovery Mode When Association Functions on an Existing Association do not Intersect**

NPAC SMS shall return an abort for a bind request if a service provider using a SOA or Local SMS attempts to establish an association with NPAC SMS in recovery mode, and an association that does not have intersecting association functions already exists in either normal mode or recovery mode for the same service provider and local system. This requirement applies for the CMIP interface only.

**Req. 3 Abort Attempt to Establish an Association in Normal Mode When Association Functions on an Existing Association in Recovery do not Intersect**

NPAC SMS shall return an abort for a bind request if a service provider using a SOA or Local SMS attempts to establish an association with NPAC SMS in normal mode, and an association that does not have intersecting association functions already exists in recovery mode for the same service provider and local system. This requirement applies for the CMIP interface only.

The new requirements supersede requirement RR6-186, which can then be deleted:

RR6-186 Treatment of Multiple Associations when there is an Intersection of Association Function

DELETED

# IIS Changes:

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4.3.1 Action Interface Functionality

The table below contains the mapping of the SOA to NPAC SMS and the Local SMS to NPAC SMS actions to the interface functionality.

Exhibit 10. The Action Interface Functionality Table

| **Action Name** | **Interface Requirements Mapping** |
| --- | --- |
| lnpRecoveryComplete | This action is used to specify the system has recovered from down time, the association established for recovery by a Local SMS or SOA shall resume normal mode, and the transactions performed since the association establishment can now be sent to the Local SMS from the NPAC SMS using the Local SMS to NPAC SMS interface or the SOA from the NPAC SMS using the SOA to NPAC SMS interface. |

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5.3.4 Recovery

The SOA and Local SMS associations are viewed to be permanent connections by the NPAC SMS. Thus when the association is broken for any reason, the system connecting to the NPAC SMS must assume responsibility to recover and resynchronize themselves with the NPAC SMS.

A primary SPID using a SOA, or a SPID using a Local SMS, may establish more than one association with the NPAC SMS under the following constraints regarding recovery. NPAC SMS will allow only one association from a given service provider and local system (SOA or LSMS) to be established for recovery, and will not allow other associations to be established in normal mode until recovery is complete. More specifically:

a) For a service provider and local system (SOA or LSMS) attempting to establish an association in recovery mode:

i) If an association that does not have intersecting association functions already exists (in either normal mode or recovery mode) for the same service provider and local system, NPAC SMS will reject the bind request.

ii) If no other association exists for the same service provider and local system, or the only associations that exist for the same service provider and local system have intersecting association functions, NPAC SMS will accept the bind request. NPAC SMS will abort any previous association(s) using the same association function(s).

b) For a service provider and local system (SOA or LSMS) attempting to establish an association in normal mode:

i) If an association that does not have intersecting association functions already exists in recovery mode for the same service provider and local system, NPAC SMS will reject the bind request.

ii) If no other association exists for the same service provider and local system, or the only associations that exist for the same service provider and local system either exist in normal mode or have intersecting association functions, NPAC SMS will accept the bind request. NPAC SMS will abort any previous association(s) using the same association function(s).

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Upon completion of recovery, the SOA/LSMS should issue an lnpRecoveryComplete message indicating the end of the missed data, and processing between the SOA/LSMS and NPAC SMS will resume normal mode. Since only one association for a given SPID/local system is allowed to be in recovery mode, and no other associations for that SPID/local system are allowed to be established in normal mode while the association is in recovery mode, the lnpRecoveryComplete message indicates that both the association and the local system (SOA/LSMS) have resumed normal mode.

# GDMO Changes:

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lnpNPAC-SMS-Behavior BEHAVIOUR

 DEFINED AS !

 NPAC SMS Managed Object for the SOA to NPAC SMS and the Local SMS

 to NPAC SMS interface.

 A Local SMS and SOA can M-GET any lnpNPAC-SMS object.

 The lnpNPAC-SMS-Name attribute is read only and can not be

 changed via either Interface once the object has been created.

 The lnpRecoveryComplete-Pkg is used to indicate the

 recovery mode of the association established for recovery by a Local SMS or SOA is complete and to send all

 updates made since the recovery mode began. (Data Download Functional

 Group).

 The lnpNotificationRecoveryPkg is used to recover notifications

 in recovery mode by the Local SMS or SOA. (Data Download

 Functional Group).

 Only one of these objects will exist and it will only be

 created at startup of the CMIP agent software on the NPAC SMS.

 The lnpNPAC-SMS-Operational-Information will be used to notify

 service provider SOA and Local SMS systems of planned outages.

 The subscriptionVersionNewNPA-NXX is used to support

 number pooling.

 A SOA or LSMS may implement an Application Level Heartbeat functionality.

 With this functionality the NPAC SMS will send a periodic Heartbeat

 message when a quiet period between the SOA/LSMS and the NPAC

 SMS exceeds the tunable value. If a SOA/LSMS fails to respond to the

 Heartbeat message within a timeout period, the association will be

 aborted by the NPAC SMS.

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lnpRecoveryCompleteBehavior BEHAVIOUR

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 Preconditions: This action is issued from an LSMS or SOA that

 specified the recovery mode flag in the access control as true at

 association establishment.

 Postconditions: After this action has been executed by the Local

 SMS or SOA specifying recovery is complete, the single association that was established in recovery mode, and therefore the Local SMS and SOA, will resume normal mode. The NPAC SMS will

 forward those updates requested which took place for the network

 subscription and number pool block data as well as any notifications

 since the association was established. The

 NPAC SMS will queue up all new events while the Local SMS is in

 recovery mode and send them to the Local SMS at the next

 scheduled retry interval after responding with the lnpRecoveryComplete

 action reply.

 If a recovery complete request fails in the NPAC SMS the failure reason

 will be returned in the reply.

 The NPAC SMS will queue up all new events while the Local SMS is in

 recovery mode, and send them to the Local SMS after responding with the

 lnpRecoveryComplete action reply.

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# ASN.1 Changes

None.