

3.1.5. SOA to NPAC SMS Naming Hierarchy for the NPAC SMS

The SOA to NPAC SMS Naming Hierarchy for the NPAC SMS shows the naming hierarchy used in the NPAC SMS to instantiate objects defined in the SOA to NPAC SMS interface.

Shaded objects are instantiated at NPAC SMS start-up and are not created via M-CREATE or M-DELETE requests. All other objects are created at start-up from a persistent object store on the NPAC SMS or from actions taken while the NPAC SMS is running.

Each object class belongs to one or more Association Functions.
Refer to *Section 0, Association Functions*.

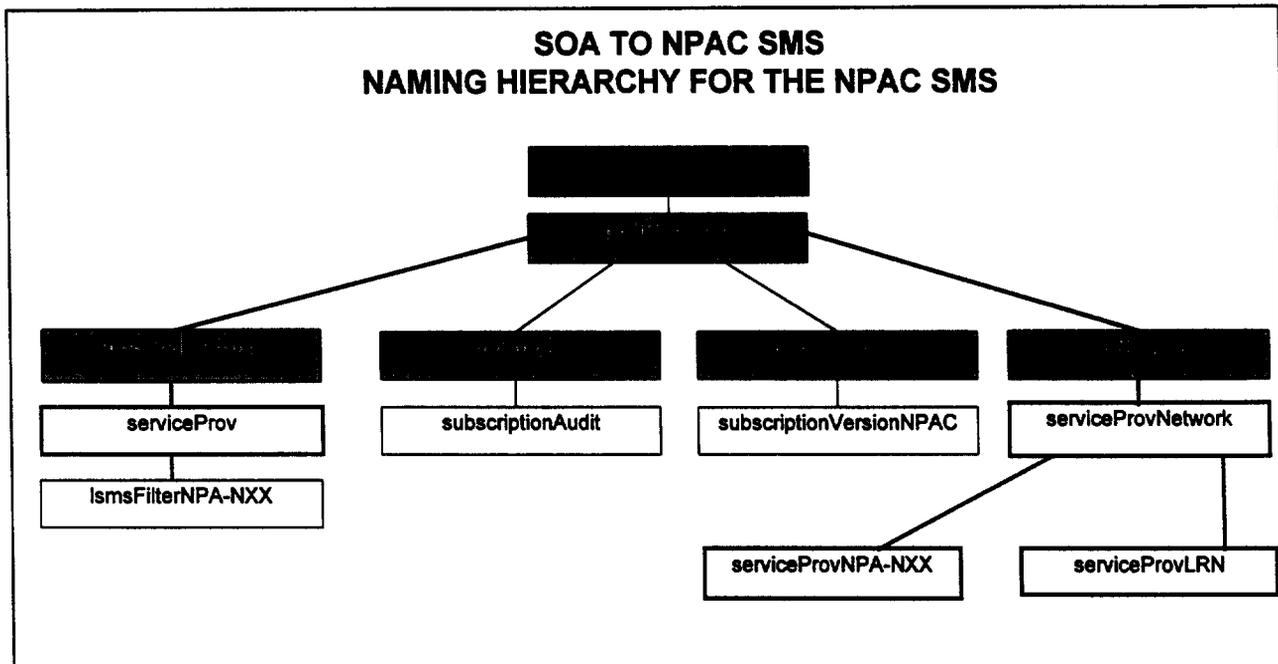


Exhibit 6. The SOA to NPAC SMS Naming Hierarchy for the NPAC SMS.

4. Interface Functionality to CMIP Definition Mapping

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4.1. Overview

The following tables, Exhibits 7-11, contain the mapping of the interface functionality to managed objects, attributes, actions, and notifications.

4.1.1. Primary NPAC Mechanized Interface Operations

The primary interface functions in support of the NPAC requirements are described in the table below, as well as their corresponding Common Management Information Exchange (CMISE) operation and referenced object type for that operation. This table does not include miscellaneous operations, such as service provider network data querying or downloading, etc. These functions are described in the object behaviors in the GDMO source below.

Exhibit 7. Primary NPAC Mechanized Interface Operations Table

Function	Direction (To/From)	CMIP Operation	Referenced Object Type
Abort/Cancel Audit Request	from SOA	M-DELETE	subscriptionAudit
Audit Complete	to SOA	M-EVENT-REPORT: subscriptionAuditResults	subscriptionAudit
Audit Discrepancy	to SOA	M-EVENT-REPORT: subscriptionAuditDiscrepancyRpt	subscriptionAudit
Audit Query	from SOA	M-GET	subscriptionAudit
Audit Request SOA	from SOA	M-CREATE	subscriptionAudit
Cancellation Acknowledge- ment	from SOA (new service provider)	M-ACTION: subscriptionVersionNewSP- CancellationAcknowledge	InpSubscriptions
Cancellation Acknowledge- ment	from SOA (old service provider)	M-ACTION: subscriptionVersionOldSP- CancellationAcknowledge	InpSubscriptions
Conflict Removal	from SOA (new service provider)	M-ACTION: subscriptionVersionRemoveFromConflict	InpSubscriptions

Function	Direction (To/From)	CMIP Operation	Related Object Type
Customer Disconnect Date	to SOA	M-EVENT-REPORT: subscriptionVersionDonorSP- CustomerDisconnectDate	subscriptionVersionNPAC
<u>Final Request for Version Create</u>	<u>to SOA</u> <u>(old service provider)</u>	<u>M-EVENT-REPORT:</u> <u>subscriptionVersionOldSP-</u> <u>FinalConcurrenceWindowExpiration</u>	<u>subscriptionVersionNPAC</u>
LSMS Filter NPA-NXX Create	from LOCAL SMS	M-CREATE	lsmsFilterNPA-NXX
LSMS Filter NPA-NXX Delete	from LOCAL SMS	M-DELETE	lsmsFilterNPA-NXX
LSMS Filter NPA-NXX Query	from LOCAL SMS	M-GET	lsmsFilterNPA-NXX
Network Data Download	from LOCAL SMS	M-ACTION: InpDownload or M-GET: scoped and filtered for intended serviceProvLRN, serviceProvNPA-NXX service provider attributes	InpNetwork
Network Data Update	from LOCAL SMS or from SOA	M-CREATE: or M-SET: on relevant serviceProvLRN, serviceProvNPA-NXX service provider attributes	serviceProvLRN, serviceProvNPA-NXX
New NPA-NXX	to LOCAL SMS	M-EVENT-REPORT: subscriptionVersionNewNPA-NXX	subscriptionVersionNPAC
Recovery Complete	from LOCAL SMS	M-ACTION: InpRecoveryComplete	InpNPAC-SMS
Request for Cancellation Acknowledgment	to SOA	M-EVENT-REPORT: subscription VersionCancellationAcknowledgment Request	subscriptionVersionNPAC
Request for Version Create	to SOA (new service provider)	M-EVENT-REPORT: subscriptionVersionNewSPCreate Request	subscriptionVersionNPAC
Request for Version Create	to SOA (old service provider)	M-EVENT-REPORT: subscriptionVersionOldSPConcurrence Request	subscriptionVersionNPAC
Service Provider Network Creation	to LOCAL SMS	M-CREATE	serviceProvNetwork

Function	Direction (To/From)	CMIP Operation	Related Object Type
Service Provider Network Deletion	to LOCAL SMS	M-DELETE	serviceProvNetwork
Service Provider Network Service Provider Name Change	to LOCAL SMS	M-SET: serviceProvName	serviceProvNetwork
Subscription Version Activate	from SOA	M-ACTION: subscriptionVersionActivate	lnpSubscriptions
Subscription Version Cancel	from SOA	M-ACTION subscriptionVersionCancel	lnpSubscriptions
Subscription Version Change Notification	to SOA	M-EVENT-REPORT: attributeValueChangeNotification or subscriptionVersionStatusAttributeValue Change	subscriptionVersionNPAC
Subscription Version Conflict	from SOA (old service provider)	M-ACTION: subscriptionVersionOldSP-Create setting subscriptionOldSP-Authorization = FALSE Note: This is an enhancement based on the current IIS, superseding RFP narrative 5.1.2.2 for manual-only conflict on/off	subscriptionVersion
Subscription Version Create	to LOCAL SMS	M-ACTION: subscriptionVersionLocalSMS-Create for multiple creates (i.e., range operations) where the data in the subscription versions is the same M-CREATE: for an individual subscriptionVersion	lnpSubscriptions subscriptionVersion
Subscription Version Create	from SOA	M-ACTION: subscriptionVersionOldSP-Create or subscriptionVersionNewSP-Create	lnpSubscriptions
Subscription Version Delete	to LOCAL SMS	M-DELETE: scoped and filtered for intended subscriptionVersion criteria	subscriptionVersion
Subscription Version Disconnect	from SOA	M-ACTION: subscriptionVersionDisconnect	lnpSubscriptions
Subscription Version Download	to LOCAL SMS	M-ACTION: subscriptionVersionLocalSMS-Create or M-CREATE: for an individual subscriptionVersion	lnpSubscriptions

Function	Direction (To/From)	CMIP Operations	Resources Object Type
Subscription Version Download Request	from LOCAL SMS	M-ACTION: InpDownload or M-GET: scoped and filtered for intended subscriptionVersionNPAC criteria	InpSubscriptions
Subscription Version Modify	from SOA	M-ACTION: subscriptionVersion Modify or M-SET: on relevant subscriptionVersionNPAC attributes for pending, active, and conflict versions	InpSubscriptions
Subscription Version Modify	to LOCAL SMS	M-SET: scoped and filtered for intended subscriptionVersion criteria setting relevant attributes	InpSubscriptions
Subscription Version Query	from SOA from LOCAL SMS	M-GET: scoped and filtered for intended subscriptionVersionNPAC criteria setting relevant attributes	InpSubscriptions
Subscription Version Query	to LOCAL SMS	M-GET: scoped and filtered for intended subscriptionVersion criteria	InpSubscriptions

4.1.2. Managed Object Interface Functionality

The table below contains the mapping of the SOA to NPAC SMS and the Local SMS to NPAC SMS managed objects to the interface functionality described in the RFP.

Exhibit 8. Managed Object Interface Functionality Table

Managed Object Name	Interface Functionality Mapping
InpAudits	Container object used to contain all subscription audit objects on the NPAC SMS and the Local SMS. It is used in the SOA to NPAC SMS interface to support audit functionality.
InpLocal SMS	Container object used to contain all objects on a Local SMS. It is used in the NPAC SMS to Local SMS interface to support NPAC SMS communication to the service provider Local SMS system.
InpLogAudit- DiscrepancyRptRecord	Object used to log information from a subscriptionAudit-DiscrepancyRpt notification.
InpLogAuditResultsRecord	Object used to log information from a subscriptionAuditResults notification.

Managed Object Name	Interface Functionality Mapping
InpLogCancellationAcknowledgeRequestRecord	Object used to log information from a subscriptionVersionCancellationAcknowledgeRequest notification.
InpLogDonorSP-CustomerDisconnectDateRecord	Object used to log information from a subscriptionVersionDonorSP-CustomerDisconnectDate notification.
InpLogLocalSMS-ActionResultsRecord	Object used to log information from a subscriptionVersionLocalSMS-ActionResults notification.
InpLogNewNPA-NXXRecord	Object used to log information from a subscriptionVersionNewNPA-NXX notification.
InpLogNewSP-CreateRequestRecord	Object used to log information from a subscriptionVersionNewSP-CreateRequest notification.
InpLogOldSP-ConcurrenceRequestRecord	Object used to log information from a subscriptionVersionOldSP-ConcurrenceRequest notification.
<u>InpLogOldSP-FinalConcurrenceWindowExpiration</u>	<u>Object used to log information from a subscriptionVersionOldSP-FinalConcurrenceWindowExpiration notification</u>
InpLogOperational-InformationRecord	Object used to log information from a InpNPAC-SMS-Operational-Information notification.
InpLogStatusAttributeValueChangeRecord	Object used to log information from a subscriptionVersionStatusAttributeValueChange notification.
InpNetwork	Container object used to contain all service provider network data on the NPAC SMS and the Local SMS. It is used in the NPAC SMS to Local SMS interface to support downloading of network data to the Local SMS and the functionality that allows service providers to create/delete their network data on the NPAC SMS.
InpNPAC-SMS	Container object used to contain all objects on a NPAC SMS. It is used in the NPAC SMS to Local SMS interface to support NPAC SMS communication from the service provider Local SMS and the SOA systems.
InpServiceProvs	Container object used to contain all service provider data on the NPAC SMS. It is used in the NPAC SMS to Local SMS interface to support retrieving of service provider data from the Local SMS and the functionality that allows service providers to update their service provider data on the NPAC SMS. Service providers can only retrieve their own service provider data.
InpSubscriptions	Container object used to contain all subscription versions on the NPAC SMS and the Local SMS. It is used in the NPAC SMS to Local SMS interface to support query of subscription data on the NPAC SMS and downloading of subscription data to the Local SMS.
IsmsFilterNPA-NXX	Object used to represent the NPA-NXX values for which a service provider does not want to be informed of subscription version broadcasts.

Managed Object Name	Interface Functionality Mapping
serviceProv	Object used to represent a service provider and its associated data on the NPAC SMS. These objects are used in the NPAC SMS to Local SMS interface to support retrieving of service provider data from the Local SMS and the functionality that allows service providers to update their service provider data on the NPAC SMS except serviceProvId and serviceProvType. Service providers can only retrieve their own service provider data.
serviceProvLRN	Object used to represent an LRN associated with a service provider on the NPAC SMS or the Local SMS. These objects are used to support downloading of network LRN data to the Local SMS and the functionality that allows service providers to create/delete their own network LRN data. The service provider will have to add a new object and delete the old one to modify the data.
serviceProvNetwork	Container object used to contain network data for a service provider on the NPAC SMS and the Local SMS. It is used in the NPAC SMS to Local SMS interface to support downloading of network data to the Local SMS and the functionality that allows service providers to update their network data on the NPAC SMS.
serviceProvNPA-NXX	Object used to represent an NPA-NXX associated with a service provider on the NPAC SMS or the Local SMS. These objects are used to support downloading of network NPA-NXX data to the Local SMS and the functionality that allows service providers to create/delete their own network NPA-NXX data. NPA splits are supported only through direct contact with NPAC personnel.
subscriptionAudit	Object used to represent a subscription audit request on the NPAC SMS. These objects are used to support subscription audit requests from the SOA to the NPAC SMS using the SOA to NPAC SMS interface. The object supports notifications for audit discrepancies found and audit completion results.
subscriptionVersion	Object used to represent a subscription version on the Local SMS. These objects are used to support subscription version download from the NPAC SMS to the Local SMS using the NPAC SMS to Local SMS interface
subscriptionVersionNPAC	Object used to represent a subscription version on the NPAC SMS. These objects are used to support subscription administration from the SOA using the SOA to NPAC SMS interface. Capability is provided for version creation, activation, modification, cancellation, and disconnect.

4.1.3. Attribute Interface Functionality

The table below contains the mapping of the SOA to NPAC SMS and the Local SMS to NPAC SMS attributes to the interface functionality described in the RFP.

Exhibit 9. Attribute Interface Functionality Table

Attribute Name	Interface Requirements Mapping
accessControl	This attribute is used to define access control information for security. It is used in the NPAC SMS to Local SMS and SOA to NPAC SMS interfaces.
actionResultsStatus	This attribute is used to store the status of an action that sends back an asynchronous notification with the results.

Attribute Name	Interface Requirements Mapping
additionalDownTimeInformation	This attribute is used to provide additional information about a planned NPAC SMS outage. It is used to support the notification of operational outages to the service provider SOA and Local SMS systems using the SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface.
auditDiscrepancyFailureReason	This attribute is used to specify the failure reason for a discrepancy in the InpLogAudit-DiscrepancyRptRecord.
auditDiscrepancyLSMS-SP-Id	This attribute is used to specify the service provider Id of the Local SMS on which a discrepancy was found in the InpLogAudit-DiscrepancyRptRecord.
auditDiscrepancyTn	This attribute is used to specify the TN for which a discrepancy was found in the InpLogAudit-DiscrepancyRptRecord.
auditDiscrepancyVersionId	This attribute is used to specify the version Id for which a discrepancy was found in the InpLogAudit-DiscrepancyRptRecord.
auditResultCompletionTime	This attribute is used to specify the completion time of an audit in the InpLogAuditResultsRecord.
auditResultFailed-SP-List	This attribute is used to specify the list of failed service provider Local SMSs for a failed audit. It is used to support the audit functionality from the service provider SOA using the SOA to NPAC SMS interface.
auditResultNumberDiscrepancies	This attribute is used to specify the number of discrepancies found in an audit in the InpLogAuditResultsRecord.
auditResultStatus	This attribute is used to specify the final status of an audit in the InpLogAuditResultsRecord.
downTime	This attribute is used to specify the down time in the InpLogOperational-InformationRecord.
failedTN-List	This attribute is used to indicate the TN(s) and errors for a failed action in the return asynchronous notification.
InpAuditsName	This attribute is used to specify the name of the audit container. It is used to support audit functionality in the NPAC SMS using the SOA to NPAC SMS interface.
InpLocal-SMS-Name	This attribute is used to specify the name of the Local SMS data container. It is used to support the NPAC SMS to Local SMS interface.
InpNetworkName	This attribute is used to specify the name of the network data container. It is used to support download functionality to the Local SMS in the NPAC SMS to Local SMS interface.
InpNPAC-SMS-Name	This attribute is used to specify the name of the NPAC SMS data container. It is used to support the NPAC SMS to Local SMS interface.

Attribute Name	Interface Requirements Mapping
InpServiceProvsName	This attribute is used to specify the name of the service provider data container. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
InpSpecificInfo	This attribute is used to pass specific error information in the case of a cmip processing failure error.
InpSubscriptionsName	This attribute is used to specify the name of the subscription container. It is used to support subscription download functionality to the service provider Local SMS systems and subscription administration functionality for the SOA systems using the SOA to NPAC SMS and Local SMS to NPAC SMS interfaces.
lsmsFilterNPA-NXX-Id	This attribute is used to specify the LSMS Filter NPA-NXX unique identifier. It supports the broadcast of subscription versions.
lsmsFilterNPA-NXX-Value	This attribute is used to specify the service provider NPA-NXX value. It supports the broadcast of subscription versions.
npacContactNumber	This attribute is used to indicate the NPAC contact number to be called concerning an NPAC SMS outage. It is used to support the notification of operational outages to the service provider SOA and Local SMS systems using the SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface.
npacCustomerAllowableFunctions	This attribute is used to specify what functions a service provider can perform on the SOA to NPAC SMS and NPAC SMS to Local SMS interfaces.
resultsCompletionTime	This attribute is used to store the completion time of the action in the action results notification.
serviceProvAddress	This attribute is used to specify the service provider address data. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
serviceProvBillingAddress	This attribute is used to specify the service provider billing address data. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
serviceProvConflictAddress	This attribute is used to specify the service provider conflict address data. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.

Attribute Name	Interface Requirements Mapping
serviceProvDownloadReason	This attribute is used to specify the reason for download in the serviceProvLRN and serviceProvNPA-NXX objects. It is used in the NPAC SMS to Local SMS Interface.
serviceProvID	This attribute is used to specify the service provider Id to uniquely identify a service provider object. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
serviceProvLRN-ID	This attribute is used to specify the service provider LRN unique identifier. It is used to support downloading of network LRN data to the Local SMS and the functionality that allows service providers to update their own network LRN data.
serviceProvLRN-CreationTimeStamp	This attribute is used to specify the last date and time the serviceProvLRN object was created on the NPAC SMS. It is used in the NPAC SMS to Local SMS Interface.
serviceProvLRN-Value	This attribute is used to specify the value for a service provider LRN associated with an NPA-NXX.
serviceProvLSMS-Address	This attribute is used to specify the service provider Local SMS contact address data. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
serviceProvName	This attribute is used to specify the service provider English name. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
serviceProvNetAddress	This attribute is used to specify the service provider Network operations contact address data. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
serviceProvNPA-NXX-EffectiveTimeStamp	This attribute is used to specify the effective date on which the service provider NPA-NXX is available for LNP. It is used in the NPAC SMS to Local SMS interface.
serviceProvNPA-NXX-ID	This attribute is used to specify the service provider NPA-NXX unique identifier. It is used to support downloading of network NPA-NXX data to the Local SMS and the functionality that allows service providers to update their own network NPA-NXX data.
serviceProvNPA-NXX-CreationTimeStamp	This attribute is used to specify the date and time the serviceProvNPA-NXX object was created. It is used in the NPAC SMS to Local SMS Interface.

Attribute Name	Interface Requirements Mapping
serviceProvNPA-NXX-Value	This attribute is used to specify the service provider NPA-NXX value. It is used to support downloading of network NPA-NXX data to the Local SMS.
serviceProvOperationsAddress	This attribute is used to specify the service provider operations contact address data. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
serviceProvRepairCenterInfo	This attribute is used to specify the repair center information for a service provider.
serviceProvSOA-Address	This attribute is used to specify the service provider SOA contact address data. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
serviceProvSysLinkInfo	This attribute is used to specify the service provider network address connectivity data. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS interface and the SOA to NPAC SMS interface.
serviceProvUserAdminAddress	This attribute is used to specify the service provider user administration contact address data. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
serviceProvWebAddress	This attribute is used to specify the service provider web contact address data. It is used to support service provider data query and the Lockheed Martin functionality for service provider data update in the NPAC SMS using the Local SMS to NPAC SMS or SOA to NPAC SMS interface.
subscriptionActivationTimeStamp	This attribute is used to specify the subscription version activation time stamp. It is used to support service provider data administration in NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionAuditAttributeList	This attribute is used to specify a list of attributes in a subscription version that are to be audited. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionAuditId	This attribute is used to uniquely identify an audit request. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.

Attribute Name	Interface Requirements Mapping
subscriptionAuditName	This attribute is used to give an English name to an audit request. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS.
subscriptionAuditNonPortedTNs	This attribute is used to specify if non-porting TNs should be audited in an audit request. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionAuditNumberOfTNs	This attribute is used to specify the number of TNs being audited in an audit request. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionAuditNumberOfTNsComplete	This attribute is used to specify the number of TNs that have been successfully audited in a complete or in progress audit request. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionAuditRequestingSP	This attribute is used to specify the service provider Id that requested the audit.
subscriptionAuditServiceProvIdRange	This attribute is used to identify a specific service provider or if all service providers should be audited in an audit request. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionAuditStatus	This attribute is used to specify the status of an audit request. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionAuditTN-ActivationRange	This attribute is used to specify the activation date and time range for TNs to be audited in an audit request. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionAuditTN-AtSuspend	This attribute is used to specify the last TN that was audited when an audit request was suspended in the network. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionAuditTN-NotificationNumber	This attribute is used to specify the number of TNs that have completed audit before the number of subscriptionAuditNumberOfTNsComplete gets incremented in an audit request. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionAuditTN-Range	This attribute is used specify the range of TNs to be audited in an audit request. It is used to support audit functionality from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.

Attribute Name	Interface Requirements Mapping
subscriptionBillingId	This attribute is used to specify the subscription version service provider billing Id. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionBroadcastTimeStamp	This attribute is used to specify the subscription version's broadcast from the NPAC SMS to the Local SMS systems time stamp. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionCancellationTimeStamp	This attribute is used to specify the subscription version cancellation time stamp. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionCLASS-DPC	This attribute is used to specify the subscription version CLASS DPC Type. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionCLASS-SSN	This attribute is used to specify the subscription version CLASS SSN. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionCNAM-DPC	This attribute is used to specify the CNAM DPC in the subscriptionVersion object. It is used in the both the NPAC SMS to Local SMS Interface and the SOA to NPAC SMS Interface.
subscriptionCNAM-SSN	This attribute is used to specify the CNAM SSN in the subscriptionVersion object. It is used in the both the NPAC SMS to Local SMS Interface and the SOA to NPAC SMS Interface.
subscriptionConflictTimeStamp	This attribute is used to specify the subscription conflict time stamp. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.

Attribute Name	Interface Requirements Mapping
subscriptionCreationTimeStamp	This attribute is used to specify the subscription version creation time stamp. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionCustomerDisconnectDate	This attribute is used to specify the timestamp of when the customer was disconnected.
subscriptionDisconnectCompleteTimestamp	This attribute is used to specify the timestamp of when the subscription version was disconnect. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to the NPAC SMS interface.
subscriptionDownloadReason	This attribute is used to specify the reason for download in the subscriptionVersion objects. It is used in the NPAC SMS to Local SMS Interface.
subscriptionEffectiveReleaseDate	This attribute is used to specify the subscription version disconnect date. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionEndUserLocationType	This attribute is used to specify the subscription version end user location type. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionEndUserLocationValue	This attribute is used to specify the subscription version end user location value. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionFailed -SP-List	This attribute is used to store the failed service providers after a subscription version broadcast results in a failed or partially-failed subscription version status.
subscriptionISVM-DPC	This attribute is used to specify the ISVM DPC in the subscriptionVersion object. It is used in both the NPAC SMS to Local SMS Interface and the SOA to NPAC SMS Interface.
subscriptionISVM-SSN	This attribute is used to specify the ISVM SSN in the subscriptionVersion object. It is used in both the NPAC SMS to Local SMS Interface and the SOA to NPAC SMS Interface.

Attribute Name	Interface Requirements Mapping
subscriptionLIDB-DPC	This attribute is used to specify the subscription version LIDB DPC. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionLIDB-SSN	This attribute is used to specify the LIDB SSN in the subscriptionVersion object. It is used in both the NPAC SMS to Local SMS Interface and the SOA to NPAC SMS Interface.
subscriptionLNPTType	This attribute is used to specify the subscription version LNP Type. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionLRN	This attribute is used to specify the LRN data for the subscription version. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionModifiedTimeStamp	This attribute is used to specify the timestamp of any modifications to the subscription version. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionNewCurrentSP	This attribute is used to specify the current or new service provider for the subscription version. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionNewSP-CreationTimeStamp	This attribute is used to specify the subscription version new service provider creation time stamp. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionNewSP-CancellationTimeStamp	This attribute is used to specify the time stamp of the subscription version cancellation pending acknowledgment by the new service provider. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to the NPAC SMS interface.

Attribute Name	Interface Requirements Mapping
subscriptionNewSP-ConflictResolutionTimeStamp	This attribute is used to specify the time stamp of when the subscription version was removed from conflict by the new service provider. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to the NPAC SMS interface.
subscriptionNewSP-DueDate	This attribute is used to specify the new service provider activation date and time for the subscription version. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionOldSP	This attribute is used to specify the old SP for the subscription version. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionOldSP-Authorization	This attribute is used to specify the subscription version old service provider authorization indication. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionOldSP-AuthorizationTimeStamp	This attribute is used to specify the subscription version old service provider authorization time stamp. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionOldSP-CancellationTimeStamp	This attribute is used to specify the time stamp of the subscription version cancellation pending acknowledgment by the old service provider. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to the NPAC SMS interface.
subscriptionOldSP-ConflictResolutionTimeStamp	This attribute is used to specify the time stamp of when the subscription version was removed from conflict by the old service provider. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to the NPAC SMS interface.

Attribute Name	Interface Requirements Mapping
subscriptionOldSP-DueDate	This attribute is used to specify the subscription version cutover time stamp to the new service provider. It is used to support service provider data administration in NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionOldTimeStamp	This attribute is used to specify the subscription version time stamp when the version became old. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionPortingToOriginal-SPSwitch	This attribute is used to specify that subscription version is being ported back to the original service provider. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to the NPAC SMS interface.
subscriptionPreCancellationStatus	This attribute is used to specify the previous status of a cancel-pending subscription version. Valid values are pending, conflict, sending, active, failed, failed partial, and disconnect-pending.
subscriptionStatusChangeCauseCode	This attribute is used to specify the reason a subscription version went into conflict.
subscriptionTN	This attribute is used to specify the subscription version TN for a subscription version. It is used to support service provider data administration using the SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface.
subscriptionVersionAttributeValueChangeInfo	This attribute is used to specify the attribute value change information in the InpLogVersionAttributeValueChangeRecord.
subscriptionVersionId	This attribute is used to specify the unique version id for the subscription version in the NPAC SMS. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.
subscriptionVersionStatus	This attribute is used to specify the subscription version status. It is used to support service provider data administration in the NPAC SMS using the SOA to NPAC SMS interface and subscription version download from the NPAC SMS to the Local SMS using the Local SMS to NPAC SMS interface.

4.1.4. 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 described in the RFP.

Exhibit 10. The Action Interface Functionality Table

Action Name	Interface Requirements Mapping
InpDownload	This action is used to support the downloading of subscription and network data to the Local SMS from the NPAC via the NPAC SMS to Local SMS interface.
InpRecoveryComplete	This action is used to specify the system has recovered from down time 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.
subscriptionVersionActivate	This action is used to support subscription version activation by the new service provider from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionVersionCancel	This action is used to support subscription version cancellation by a service provider from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionVersionDisconnect	This action is used to support subscription version disconnection by the current service provider from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionVersionLocalSMS-Create	This action can be used by the NPAC SMS to create multiple subscription versions via the Local SMS to NPAC SMS interface.
subscriptionVersionModify	This action is used to support subscription version modification by a service provider from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionVersionNewSP-CancellationAcknowledge	This action is used to support the acknowledgment of subscription versions with a status of cancel-pending by the old service from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionVersionNewSP-Create	This action is used to support subscription version creation by the new service provider from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionVersionOldSP-CancellationAcknowledge	This action is used to support the acknowledgment of subscription versions with a status of cancel-pending by the old service from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionVersionOldSP-Create	This action is used to support subscription version creation by the old service provider from the SOA to the NPAC SMS using the SOA to NPAC SMS interface.
subscriptionVersionRemoveFromConflict	This action is used on the NPAC SMS via the SOA to NPAC SMS interface to set the subscription version status from conflict to pending.

4.1.5. Notification Interface Functionality

The table below contains the mapping of the SOA to NPAC SMS and the Local SMS to NPAC SMS notifications to the interface functionality described in the RFP.

Exhibit 11. The Notification Interface Functionality Table

Notification Name	Interface Requirements Mapping
-------------------	--------------------------------

Notification Name	Interface Requirements Mapping
InpNPAC-SMS-Operational-Information	This notification is used to support the reporting of NPAC SMS scheduled down time. This notification can be issued from the InpNPAC-SMS object on the NPAC SMS to a SOA via the SOA to NPAC SMS interface or from the NPAC SMS to the Local SMS via the NPAC SMS to Local SMS interface.
subscriptionAudit-DiscrepancyRpt	This notification is used to support the reporting of audit discrepancies found during audit processing. This notification can be issued from an audit object on the NPAC SMS to a SOA via the SOA to NPAC SMS interface.
subscriptionAudit-Results	This notification is used to support the reporting of audit processing results. This notification can be issued from an audit object on the NPAC SMS to a SOA via the SOA to NPAC SMS interface.
subscriptionVersionCancellationAcknowledgeRequest	This notification is issued to new and old service providers to request that a cancellation acknowledgment be sent for a subscriber version in a cancel-pending state. This notification is issued via the SOA to NPAC SMS interface from the NPAC subscription version object if the service provider fails to acknowledge the cancellation after a tunable amount of time specified in the NPAC SMS service data table.
subscriptionVersionDonorSP-CustomerDisconnectDate	This notification informs the donor service provider SOA that a subscription version is being disconnected. This notification is issued from a subscription version object on the NPAC SMS to a SOA via the SOA to NPAC SMS interface.
subscriptionVersionLocalSMS-ActionResults	This notification contains the results of a subscriptionVersionLocalSMS-Create action once all the create requests have been attempted. It is issued from the Local SMS to the NPAC SMS via the NPAC SMS to Local SMS interface.
subscriptionVersionNew-NPA-NXX	This notification informs the Local SMS of a pending subscription version involving a new NPA-NXX.
subscriptionVersionNewSP-CreateRequest	This notification is issued to the new service provider to request that a create request be sent for the subscriber version created by the old service provider to provide authorization and/or porting information. This notification is issued via the SOA to NPAC SMS interface from the NPAC subscription version object if the new service provider failed to authorize porting of a number after a tunable amount of time specified in the NPAC SMS service data table.

Notification Name	Interface Requirements Mapping
subscriptionVersionOldSP-ConcurrenceRequest	This notification is issued to the old service provider to request that a create request be sent for the subscriber version created by the new service provider to provide concurrence for porting. This notification is issued via the SOA to NPAC SMS interface from the NPAC subscription version object if the old service provider failed to authorize porting of a number after a tunable amount of time specified in the NPAC SMS service data table.
subscriptionVersionStatusAttributeValueChange	This notification is issued when the subscription version status is modified. This notification is issued from both the NPAC SMS to Local SMS interface and the SOA to NPAC SMS interface from the subscriptionVersionNPAC object.

4.2. Scoping and Filtering Support

The following section defines the scoping and filtering support for both the SOA to NPAC SMS interface and LSMS to NPAC SMS interface.

4.2.1. Scoping

The LSMS to NPAC SMS interface does not support scoping of CMIP operations of any type by the LSMS for the following objects:

- root
- InpLocal-SMS
- InpNetwork
- any object with an "empty" filter

In addition, the SOA to NPAC SMS does not support scoping of CMIP operations of any type for the following objects:

- InpNPAC-SMS
- InpServiceProvs

Scoped operations for subscriptionVersions to the LSMS must be supported on the baseObject (level 0) or from the InpSubscriptions object with a non-empty filter.

The limit in scoping and functionality prevents both the NPAC and the LSMS systems from having to implement functionality or respond to large requests that are not necessary to support LNP over the mechanized interfaces.

4.2.2. Filtering

Filtering on the NPAC SMS is supported as defined in the GDMO. The NPAC SMS requires the Local SMS to support at a minimum the filter criterias specified below.

Limitations:

- OR and NOT filter support ~~is~~ are not required for the Local SMS ~~or the NPAC SMS.~~
- NOT filter support is not required for the NPAC SMS.
- Filtering requests with a scope will not be issued to the Local SMS by the NPAC SMS for any object other than the subscriptionVersion object.
- Filter requests must follow the rules of the NPAC SMS. For example, a query for data that a service provider is not authorized to view will be failed with a reason of access denied.
- The NPAC will roll-back any transaction that fails. Thus, if a SOA sends a M-SET request for a range of subscription objects and one object fails, the entire operation will be failed. The NPAC SMS will return a linked reply of error results. All errors will be accessDenied except the one that caused the failure; it will be set to an appropriate error.

The following table shows the CMISE primitive filtering support required of the Local SMS by the NPAC SMS for the subscriptionVersion object.

Exhibit 12 - CMISE Primitive Filtering Support

CMISE Primitives	Filter Supported	Notes
M-ACTION	N	No actions are defined for the subscriptionVersion object.
M-GET	Y	TN Range with greatOrEqual, lessOrEqual, equality must be supported for auditing.
M-SET	Y	TN Range with greatOrEqual, lessOrEqual, equality must be supported for Mass Update or TN range modify requests.
M-DELETE	Y	TN Range with greatOrEqual, lessOrEqual, equality will be supported for range disconnect or port to original requests.

4.3. ~~InpLocal-SMS-Name and InpNPAC-SMS-Name Values~~ InpLocal-SMS-Name and InpNPAC-SMS-Name Values

~~The following table (Exhibit 13) shows the values to be used~~ The following table (Exhibit 13) shows the values to be used for all currently identified NPAC regions for InpNPAC-SMS-Name in the InpNPAC-SMS object. The InpLocal-SMS-Name for the InpLocal-SMS object will be the service provider ID followed by a dash and the InpNPA-SMS Name (e.g., 9999-Midwest Regional NPAC SMS).

~~Exhibit 13 - Defined InpLocal-SMS-Name and InpNPAC-SMS-Name Values~~ Defined InpLocal-SMS-Name and InpNPAC-SMS-Name Values

NPAC SMS Region	InpNPAC-SMS-Name
<u>Mid-Atlantic</u>	<u>Mid-Atlantic Regional NPAC SMS</u>
<u>Midwest</u>	<u>Midwest Regional NPAC SMS</u>
<u>Northeast</u>	<u>Northeast Regional NPAC SMS</u>
<u>Southeast</u>	<u>Southeast Regional NPAC SMS</u>
<u>Southwest</u>	<u>Southwest Regional NPAC SMS</u>
<u>Western</u>	<u>West Regional NPAC SMS</u>
<u>West Coast</u>	<u>West Coast Regional NPAC SMS</u>

5. *Secure Association Establishment*

5

5.1. Overview

This chapter describes the security, the association management and recovery procedures for the service provider SOAs and Local SMSs to follow, and how error information will be passed between interfaces.

The first section describes the security and authentication procedures used in the NPAC SMS interface. The second section describes the NPAC SMS's behavior and error handling and suggests how a service provider SOA or Local SMS should proceed when establishing an association.

5.2. Security

This section describes the security processes and procedures necessary for service provider SOA systems and Local SMSs to establish a secure association and maintain secure communication with the NPAC SMS. Security threats to the NPAC SMS include:

- Spoofing - An intruder may masquerade as either the SOA, Local SMS, or NPAC SMS to falsely report information.
- Message Tampering - An intruder may modify, delete, or create messages passed.
- Denial or Disruption of Service - An intruder may cause denial or disruption of service by generating or modifying messages.
- Diversion of Resources - An intruder may generate or modify messages that cause resources to be diverted to unnecessary tasks.
- Slamming - An intruder may generate or modify messages that cause customer's service to be moved between service providers.

Security threats are prevented in the NPAC SMS by use of the following methods:

- Strong two way authentication at association.
- Insuring data integrity by detection of replay, deletion, or modification to a message.
- Insuring non-repudiation of data by guaranteeing integrity and supporting data origination authentication for each incoming message.
- Implementation of access control and application level security that allows only authorized parties to cause changes to the NPAC SMS database.

5.2.1. Authentication and Access Control Information

The following access control information definition will be used in the AccessControl field of the association and CMIP PDUs to insure a secure communication for both the SOA to NPAC SMS interface and the NPAC SMS to Local SMS interface:

```

LnpAccessControl ::= SEQUENCE {
    systemId          [0] SystemID,
    systemType       [1] SystemType,
    userId           [2] GraphicString60 OPTIONAL,
    listId           [3] INTEGER,
    keyId            [4] INTEGER,
    cmipDepartureTime [5] GeneralizedTime,
    sequenceNumber   [6] INTEGER (0...4294967295),
    function          [7] AssociationFunction,
    recoveryMode     [8] BOOLEAN
    signature        [9] BIT STRING
}

ServiceProvId ::= GraphicString4

SystemID ::= CHOICE {
    serviceProvID [0] ServiceProvId,
    npac-sms [1] GraphicString60
}

SystemType ::= ENUMERATED {
    soa(0),
    local-sms(1),
    soa-and-local-sms(2),
    npac-sms(3) --value is only valid for AccessControl
                definition
}

AssociationFunction ::= SEQUENCE {
    soaUnits [0] SoaUnits,
    lsmsUnits [1] LSMSUnits
}

SoaUnits ::= SEQUENCE {
    soaMgmt [0] NULL OPTIONAL,
    networkDataMgmt [1] NULL OPTIONAL
}

```

Exhibit 14 Access Control

5.2.1.1. System Id

The system Id is the unique Id for the system using an interoperable interface and must be specified in the systemId field. For a service provider using the SOA and/or Local SMS interfaces, this is the Service Provider ID. For the NPAC SMS, it is the unique identifier for the regional SMS.

5.2.1.2. System Type

The system type that indicates the type of system using the interoperable interface must be specified in the systemType field. The valid types are SOA and/or Local SMS and NPAC SMS.

5.2.1.3. User Id

The user Id of the user of the interface can optionally be specified in the userId field for the SOA interface. This is the 60 character graphics string user identifier for a user on a SOA system. It is not validated on the NPAC SMS, however, it is used for logging purposes.

5.2.1.4. List Id

The list Id must be specified as an integer in the listId field to identify a key list. This key list is one of the key lists exchanged outside of the interface process that is known to both the NPAC SMS and the Local SMS or SOA system it is communicating with.

5.2.1.5. Key Id

The key Id of a key in the key list must be specified as an integer in the keyId field. This uniquely identifies the key in the key list used to create the digital signature. The size of the modulus for the key is 600 bits as specified by the ICC.

Keys will be treated independently at the presentation layer for an association. By using presentation layer support of a key, SOAs and LSMS systems could have unique keys. In addition, if an LSMS is made up of two processes, one supporting network subscription data and the other supporting query; they could have unique keys.

5.2.1.6. CMIP Departure Time

The CMIP departure time must be specified in GeneralizedTime in the cmipDepartureTime field as the time the PDU departed the sending system. In order to insure data integrity and no-repudiation the NPAC SMS system must be synchronized to within two minutes of the Local SMS and SOA systems that it communicates.

5.2.1.7. Sequence Number

The sequence number is a 32 bit integer that must be specified in the sequenceNumber field. It should be specified as zero at association time and incremented by one for every message sent over the association. Once the sequence number reaches 4294967295 the counter will be reset to one for the association. Please note that each sender independently keeps its own counter