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Definitions of Managed Objects for APPN

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it defines objects for monitoring and controlling network devices with APPN (Advanced Peer-to-Peer Networking) capabilities. This memo identifies managed objects for the APPN protocol.

Table of Contents

1.	Introduction	2
2.	The SNMPv2 Network Management Framework	2
3.	Overview	3
3.1	Relationship with RFC 2155	6
3.2	APPN MIB structure	7
4.	Definitions	10
5.	Security Considerations	135
6.	Intellectual Property	136
7.	Acknowledgments	137
8.	References	137
9.	Authors' Addresses	139
10.	Full Copyright Statement	140

1. Introduction

This document is a product of the SNA NAU Services MIB Working Group. It defines a MIB module for managing devices with Advanced Peer-to-Peer Networking (APPN) capabilities.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [17].

2. The SNMP Network Management Framework

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in RFC 2271 [1].
- o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIV1 and described in STD 16, RFC 1155 [2], STD 16, RFC 1212 [3] and RFC 1215 [4]. The second version, called SMIV2, is described in RFC 1902 [5], RFC 1903 [6] and RFC 1904 [7].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, RFC 1157 [8]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in RFC 1901 [9] and RFC 1906 [10]. The third version of the message protocol is called SNMPv3 and described in RFC 1906 [10], RFC 2272 [11] and RFC 2274 [12].
- o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, RFC 1157 [8]. A second set of protocol operations and associated PDU formats is described in RFC 1905 [13].
- o A set of fundamental applications described in RFC 2273 [14] and the view-based access control mechanism described in RFC 2275 [15].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the mechanisms defined in the SMI.

This memo specifies a MIB module that is compliant to the SMIV2. A MIB conforming to the SMIV1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine readable information in SMIV2 will be converted into textual descriptions in SMIV1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

3. Overview

This document identifies a set of objects for monitoring the configuration and active characteristics of devices with APPN capabilities, and for controlling certain characteristics. APPN is the aspect of Systems Network Architecture (SNA) that supports peer-to-peer networking. These networks transport both independent and dependent LU session traffic. See the SNANAU APPC MIB [21] and the SNA NAU MIB [22] for management of these sessions. See also RFC 2232, the DLUR MIB [23], and RFC 2238, the HPR MIB [24] for management of extensions to the APPN architecture. In this document, we describe APPN managed objects.

An APPN network comprises various types of nodes, and transmission groups (TGs) that connect the nodes. Network nodes (NNs) provide directory and routing functions for session establishment. NNs may be session end points or intermediate nodes in a session. A border node is a type of network node that connects networks together for session establishment without fully merging them. A branch network node (BrNN) is a network node that is similar to a border node, but with only minimal functions to build a large APPN network within an enterprise. Although a BrNN is defined to be a network node in the APPN architecture, it also has an end node (EN) appearance to upstream NNs in the network. In this MIB module it is treated as a separate node type since it does not fit cleanly as an EN or NN, and this module explicitly identifies those objects returned by a BrNN. For example, a BrNN does not implement the `appnNnTopo` objects since it is the only node in its network topology table; but it does implement the `appnSessIntermediate` objects since it does have intermediate session support. It also implements two of the `appnEnUniqueCaps` objects that could be useful to a management application. A BrNN identifies itself as 'endNode' in the `appnNodeType` object but further identifies itself as a BrNN in the `appnNodeBrNn` object.

End nodes are session end points that receive directory and routing functions from network nodes, over control-point to control-point (CP-CP) sessions. Low-entry networking (LEN) nodes are also session

end points, but do not support CP-CP sessions, and therefore need additional manual configuration definitions to establish sessions in an APPN network. ENs and LEN nodes may have minimal directory and routing functions to establish control sessions (ENs) or to connect into the APPN network (LEN nodes).

Virtual routing nodes (VRNs) are not really nodes, but rather common definitions among actual nodes in a shared transport facility such as a local area network (LAN) that allow these actual nodes to temporarily establish a logical link with one another without defining each other's link-level addressing information.

Ports and link stations are the node's interface to the data link control (DLC), which provides the physical transport, or to another protocol such as Data Link Switching (DLSw), which provides transport over an IP network. See the SNADLC SDLC MIB[25], the SNADLC LLC MIB[26], and the DLSw MIB[27]. A link station uses a port to make a connection to another node. This connection establishes a TG between the two nodes.

The directory and routing functions enable an NN to find where an LU is located in the network, and calculate the optimal route for the session based on the requested class of service (COS). A network node saves the LU information in a directory database, which is built from LUs defined locally, LU registration from served end nodes, and LUs learned from network searches.

Each NN maintains a local COS database that assigns a routing weight, or relative cost, to each resource for each class of service. For example, the #INTER COS assigns a lower weight to TGs with a greater effective capacity, while the #BATCH COS favors TGs with a lower relative cost per byte.

A node saves network topology information (on NNs, VRNs, and TGs between them) in a network topology database. A node that supports APPN function set 1120, branch awareness, also saves information on TGs to adjacent BrNNs. The topology information includes state and routing characteristics. Topology information is exchanged between NNs over CP-CP sessions such that the database is fully replicated at each NN. Information on TGs to all node types are kept in a local topology database. Local topology information is shared with other nodes only during the session establishment process, to give the NN responsible for route calculation the necessary information for end-to-end route calculation.

A management application can show a full representation of the APPN network from the network and local topology information. To show the network topology, the application need only query the network

topology tables from a single NN. To show all of the BrNNs, the application must also directly query all destinations of TGs that indicate they are branch TGs (indicated by the appnNnTgFRBranchTg object) to see if they have any cascaded BrNNs. For any NNs that do not indicate branch awareness support (indicated by the appnNnNodeFRBranchAwareness object), the application must query each NN's appnLocalTgTable, and then the appnNodeBrNn object of each row's destination node to identify BrNNs. To show all of the nodes in the network, including ENs and LEN nodes, the application must query every NN's appnLocalTgTable, and iteratively do the same for each BrNN it finds.

SNA names such as LU names, CP names, COS names, and mode names can be padded with blanks (space characters) in SNA formats. These blanks are nonsignificant. For example, in a BIND Request Unit (RU) a COS name of "#INTER" with a length of 6 is identical to a COS name of "#INTER " with a length of 8. However, in this MIB, nonsignificant blanks are not included by the agent. Using the COS name from the previous example, an agent would return a length of 6 and the string "#INTER" with no blanks for appnCosName, regardless of how it appears in the BIND RU or in internal storage. The lone exception is the all blank mode name, for which the agent returns a length of 8 and the string " " (8 blank spaces). The MIB variables that this applies to are identified by a textual convention syntax that also describes this behavior.

When an SNA name is functioning as a table index, an agent treats trailing blanks as significant. If a management station requests the objects from a row with index "#INTER ", the agent does not match this to the row with index "#INTER". Since an agent has no nonsignificant blanks in any of its table indices, the only reason for a Management Station to include them would be to start GetNext processing at a chosen point in a table. For example, a GetNext request with index "M " would start retrieval from a table at the first row with an 8-character index beginning with "M" or a letter after "M".

The SNA/APPN terms and overall architecture are documented in [18], [19], [20], and [28].

Highlights of the management functions supported by the APPN MIB module include the following:

- o Activating and deactivating ports and link stations.
- o Monitoring of configuration parameters related to the node, ports, link stations, virtual routing nodes, and classes of service.

- o Monitoring of operational parameters related to ports, link stations, virtual routing nodes, topology, directory, and intermediate sessions.
- o Historical information about link station errors during connection establishment, or that caused the connection to terminate.
- o Deactivating intermediate sessions.
- o Traps for SNA Management Services (SNA/MS) Alert conditions.

This MIB module does not support:

- o Configuration of APPN nodes.
- o Monitoring and control of endpoint sessions.
- o Dependent LU Requester (DLUR) management.
- o High-Performance Routing (HPR) management.

3.1. Relationship with RFC 2155

This MIB obsoletes RFC 2155 [29] with changes due to additions to the APPN architecture and some implementation experience of RFC 2155. The changes from RFC 2155 are as follows:

- o New objects for the multi-link TG architecture enhancement: appnLsMltgMember, appnNnTgFRMltgLinkType, appnLocalTgMltgLinkType, and appnLocalEnTgMltgLinkType.
- o New objects, and explanations for values for existing objects, for the branch network node architecture enhancement: appnNodeBrNn, appnNnNodeFRBranchAwareness, appnNnTgFRBranchTg, and appnLocalTgBranchLinkType.
- o New object, appnNodeLsCounterType, to indicate which type of ANR traffic is returned in the appnLsTable traffic counters.
- o Deprecated appnNodeMibVersion object.
- o Miscellaneous editorial changes.

3.2. APPN MIB Structure

The APPN MIB module contains the following groups of objects:

- o appnNode - objects related to the APPN node for all node types.
- o appnNn - objects to represent the network nodes, virtual routing nodes, and TGs between these nodes that make up the APPN network topology database maintained in NNS.
- o appnLocalTopology - objects to represent nodes and TGs between nodes in the local topology database maintained in all nodes.
- o appnDir - objects related to LU location information from the node's directory database.
- o appnCos - objects related to classes of service information.
- o appnSessIntermediate - objects related to intermediate sessions that pass through this node.

These groups are described below in more detail.

3.2.1. appnNode group

The appnNode group consists of the following tables and objects:

1) appnGeneralInfoAndCaps

This group of objects describes general information about the APPN node. The type of information includes the node type and the time since this node was initialized.

2) appnNnUniqueInfoAndCaps

This group of objects describes information specific to network nodes such as node routing characteristics.

3) appnEnUniqueInfoAndCaps

This group of objects describes information specific to end nodes, with two objects that also apply to branch network nodes. This group includes an object indicating the node's network node server.

4) appnPortInformation

This includes the appnPortTable, which describes the configuration and current status of the ports used by APPN, including the port state and DLC type.

5) appnLinkStationInformation

This includes the appnNodeLsTable, which describes the configuration and current status of the link stations used by APPN, including the link state and port name; and the appnLsStatusTable, which provides information about errors this node encountered with connections to adjacent nodes, such as the sense data captured during connection failures. It is a product option to decide how many appnLsStatusTable entries are kept.

6) appnVrnInfo

This includes the appnVrnTable, which describes the relationship between virtual routing nodes' TGs described in the appnLocalTgTable with ports in the appnPortTable.

3.2.2. appnNn group

The appnNn group consists of the following objects and tables

1) appnNnTopo

These objects contain general information about the network topology database including the number of nodes present, and the number of topology database updates (TDU) wars the node has detected.

2) appnNnTopology

This includes tables representing the APPN network topology database. This includes the network nodes, virtual routing nodes, and TGs between these nodes, as well as the information about these resources carried in topology updates. The tables are first indexed by the same flow reduction sequence number (FRSN) used in topology exchanges between NNs. This allows a management station to retrieve only incremental updates, since the agent will update the FRSN of new or changed resources.

3.2.3. appnLocalTopology group

The appnLocalTopology group consists of the following objects and tables:

1) appnLocalThisNode

a) appnLocalGeneral

Contains the local node and type.

b) appnLocalNnSpecific

These objects contain routing information about the local network node.

c) appnLocalTg

This table represents information about this node's local TGs.

2) appnLocalEnTopology

This table represents TG information for EN TGs learned by the NN via TG registration with the local node.

3.2.4. appnDir group

The appnDir group consists of the following objects and tables:

1) appnDirPerf

These objects represent information related to information about the directory database and directory searches involving this node.

2) appnDirTable

This table represents the directory database, listing LUs known to this node, along with the owning node of the LU and the serving NN of the owning node.

3.2.5. appnCos group

The appnCos group consists of the following tables:

1) appnCosModeTable

This table represents the mode to class of service mapping.

2) appnCosNameTable

This table represents the transmission priority for each class of service.

3) appnCosNodeRowTable

This table represents the node-row information for each class of service, including the weight of each node.

3) appnCostTgRowTable

This table represents the TG-row information for each class of service, including the weight of each TG.

3.2.6. appnSessIntermediate group

The appnSessIntermediate group consists of the following objects and tables:

1) appnIsInGlobal

These objects allow control of the collection of intermediate session information such as Route Selection Control Vectors (RSCVs) and counters.

2) appnIsInTable

This table contains information on active intermediate sessions.

3) appnIsRtpTable

This table contains information on active intermediate sessions that are being transported on Rapid Transport Protocol (RTP) connections by High Performance Routing (HPR).

3.2.7. appnTraps

One APPN trap is defined. It is intended to correspond to SNA/MS Alerts, but is optional for a product to implement this trap. The trap identifies the Alert ID number and, where possible, the affected resource.

4. Definitions

APPN-MIB DEFINITIONS ::= BEGIN

IMPORTS

IANAifType
FROM IANAifType-MIB

DisplayString, VariablePointer, RowPointer, DateAndTime,

TruthValue, TimeStamp, TEXTUAL-CONVENTION
FROM SNMPv2-TC

Counter32, Gauge32, Unsigned32, TimeTicks,
OBJECT-TYPE, MODULE-IDENTITY, NOTIFICATION-TYPE
FROM SNMPv2-SMI

MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
FROM SNMPv2-CONF

snanauMIB
FROM SNA-NAU-MIB;

appnMIB MODULE-IDENTITY
LAST-UPDATED "9807151800Z" -- July 15, 1998
ORGANIZATION "IETF SNA NAU MIB WG / AIW APPN MIBs SIG"
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"

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"

DESCRIPTION

"This is the MIB module for objects used to
manage network devices with APPN capabilities."

-- Revision tracking starts with Proposed Standard (RFC 2155)

REVISION "9807151800Z"

DESCRIPTION

"Minor editorial fixes; new value 'none(5)' added
to the enumeration for the appnLocalTgBranchLinkType
object."

REVISION "9805261800Z"

DESCRIPTION

"Post-RFC 2155 conformance definitions added,
appnNodeLsCounterType and appnNodeBrNn objects
added, appnNodeMibVersion object deprecated."

REVISION "9707311800Z"

DESCRIPTION

"Branch network node (Branch Extender) objects added."

REVISION "9703311800Z"

DESCRIPTION

"MLTG objects added."

REVISION "9703201200Z"

DESCRIPTION

"RFC 2155 (Proposed Standard)"

::= { snanauMIB 4 }

-- snanauMIB ::= { mib-2 34 }

-- *****

-- Textual Conventions

-- *****

SnaNodeIdentification ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"An SNA Node Identification consists of two parts, which
together comprise four bytes of hexadecimal data. In SNA the
Node Identification is transported in bytes 2-5 of the XID.

The block number is the first three digits of the Node
Identification. These 3 hexadecimal digits identify the
product.

The ID number is the last 5 digits of the Node Identification.
These 5 hexadecimal digits are administratively defined and
combined with the 3-digit block number form the 8-digit Node
Identification. A unique value is required for connections to
SNA subarea. In some implementations, the value 'bbb00000'
(where 'bbb' represents a 3-digit block number) is returned to
mean that the ID number is not unique on this node.

An SNA Node Identification is represented as eight
ASCII-encoded hexadecimal digits, using the characters '0' -
'9' and 'A' - 'F'."

SYNTAX OCTET STRING (SIZE (8))

SnaControlPointName ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A fully qualified SNA control point name, consisting of a 1 to 8 character network identifier (NetId), a period ('.'), and a 1 to 8 character control point name (CpName).

The NetId and CpName are constructed from the uppercase letters 'A' - 'Z' and the numerics '0' - '9', all encoded in ASCII, with the restriction that the first character of each must be a letter. Trailing blanks are not allowed.

Earlier versions of SNA permitted three additional characters in NetIds and CpNames: '#', '@', and '\$'. While this use of these characters has been retired, a Management Station should still accept them for backward compatibility."

SYNTAX OCTET STRING (SIZE (3..17))

SnaClassOfServiceName ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"An SNA class-of-service (COS) name, ranging from 1 to 8 ASCII characters. COS names take one of two forms:

- a user-defined COS name is constructed from the uppercase letters 'A' - 'Z' and the numerics '0' - '9', with the restriction that the first character of the name must be a letter.
- an SNA-defined user-session COS name begins with the character '#', which is followed by up to seven additional characters from the set of uppercase letters and numerics.

Trailing blanks are not allowed in either form of COS name.

A zero-length string indicates that a COS name is not available."

SYNTAX OCTET STRING (SIZE (0..8))

SnaModeName ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"An SNA mode name, ranging from 1 to 8 ASCII characters. Mode names take one of two forms:

- a user-defined mode name is constructed from the uppercase letters 'A' - 'Z' and the numerics '0' - '9',

with the restriction that the first character of the name must be a letter.

- an SNA-defined user-session mode name begins with the character '#', which is followed by up to seven additional characters from the set of uppercase letters and numerics.

Trailing blanks are not allowed in either form of mode name, with the single exception of the all-blank mode name, where a string consisting of 8 blanks is returned.

A zero-length string indicates that a mode name is not available."

SYNTAX OCTET STRING (SIZE (0..8))

SnaSenseData ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"To facilitate their display by a Management Station, sense data objects in the MIB are represented as OCTET STRINGS containing eight ASCII characters. Eight '0' characters indicates that no sense data identifying an SNA error condition is available.

An SNA sense data is represented as eight hexadecimal digits, using the characters '0' - '9' and 'A' - 'F'."

SYNTAX OCTET STRING (SIZE (8))

DisplayableDlcAddress ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"DLC address of a port or link station, represented as an OCTET STRING containing 0 to 64 ASCII characters.

A Management Station should use a value of this type only for display. The 'real' DLC address, i.e., the sequence of bytes that flow in the DLC header, is often available in a DLC-specific MIB.

The zero-length string indicates that the DLC address in question is not known to the agent."

SYNTAX OCTET STRING (SIZE (0..64))

AppnNodeCounter ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"An object providing global statistics for the entire APPN node. A Management Station can detect discontinuities in this counter by monitoring the appnNodeCounterDisconTime object."

SYNTAX Counter32

AppnPortCounter ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"An object providing statistics for an APPN port. A Management Station can detect discontinuities in this counter by monitoring the appnPortCounterDisconTime object."

SYNTAX Counter32

AppnLinkStationCounter ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"An object providing statistics for an APPN link station. A Management Station can detect discontinuities in this counter by monitoring the appnLsCounterDisconTime object."

SYNTAX Counter32

AppnTopologyEntryTimeLeft ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Number of days before deletion of this entry from the topology database. Range is 0-15. A value of 0 indicates that the entry is either in the process of being deleted, or is being marked for deletion at the next garbage collection cycle."

SYNTAX INTEGER (0..15)

AppnTgDlcData ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"DLC-specific data related to a connection network transmission group. For other TGs, a zero-length string is returned."

Examples of the type of data returned by an object with this syntax include the following:

Token-Ring	- MAC/SAP
X.25 Switched	- dial digits
X.21 Switched	- dial digits
Circuit Switch	- dial digits

This MIB does not specify formats for these or any other types of DLC-specific data. Formats may, however, be specified in documents related to a particular DLC.

The contents of an object with this syntax correspond to the contents of the DLC-specific subfields of cv46, documented in (6)."

SYNTAX OCTET STRING (SIZE (0..64))

AppnTgEffectiveCapacity ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A value representing the effective capacity of a transmission group. This is an administratively assigned value derived from the link bandwidth and maximum load factor. It is encoded in the same way as byte 7 of cv47, and represents a floating-point number in units of 300 bits per second."

SYNTAX OCTET STRING (SIZE (1))

AppnTgSecurity ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A value representing the level of security on a transmission group. A class of service definition includes an indication of the acceptable TG security value(s) for that class of service.

The following seven values are defined:

nonsecure(1) -

(X'01'): none of the values listed below;
for example, satellite-connected or
located in a nonsecure country

publicSwitchedNetwork(32) -

(X'20'): public switched network; secure
in the sense that there is no
predetermined route that traffic will take

undergroundCable(64) -

(X'40'): underground cable; located in a
secure country (as determined by the
network administrator)

secureConduit(96) -

(X'60'): secure conduit, not guarded; for
example, pressurized pipe

guardedConduit(128) -

(X'80'): guarded conduit; protected
against physical tapping


```

encrypted(160) -
    (X'A0'): link-level encryption is provided
guardedRadiation(192) -
    (X'C0'): guarded conduit containing the
               transmission medium; protected against
               physical and radiation tapping"

```

```

SYNTAX INTEGER {
    nonsecure(1),                -- X'01'
    publicSwitchedNetwork(32),   -- X'20'
    undergroundCable(64),        -- X'40'
    secureConduit(96),           -- X'60'
    guardedConduit(128),         -- X'80'
    encrypted(160),              -- X'A0'
    guardedRadiation(192)        -- X'C0'
}

```

AppnTgDelay ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Relative amount of time that it takes for a signal to travel the length of a logical link. This time is represented in microseconds, using the same encoding scheme used in cv47 in a topology update. Some of the more common values, along with their encoded hex values, are:

```

    minimum(0),                X'00'
    negligible(384),            X'4C'
    terrestrial(9216),          X'71'
    packet(147456),             X'91'
    long(294912),               X'99'
    maximum(2013265920)         X'FF'

```

"

SYNTAX OCTET STRING (SIZE (1))

```

-- *****
appnObjects          OBJECT IDENTIFIER ::= { appnMIB 1 }
-- *****

```

```

-- ***** The APPN Node Group *****

```

```

appnNode          OBJECT IDENTIFIER ::= { appnObjects 1 }
appnGeneralInfoAndCaps    OBJECT IDENTIFIER ::= { appnNode 1 }
appnNnUniqueInfoAndCaps   OBJECT IDENTIFIER ::= { appnNode 2 }
appnEnUniqueCaps          OBJECT IDENTIFIER ::= { appnNode 3 }
appnPortInformation       OBJECT IDENTIFIER ::= { appnNode 4 }

```

```

appnLinkStationInformation  OBJECT IDENTIFIER ::= { appnNode 5 }
appnVrnInfo                 OBJECT IDENTIFIER ::= { appnNode 6 }

```

```

-- This group provides global information about an APPN network node,
-- an APPN end node, an APPN branch network node, or an LEN node.

```

```

-- APPN General Information
-- This section applies to APPN network nodes, end nodes, and branch
-- network nodes, as well as to LEN end nodes.

```

```

appnNodeCpName OBJECT-TYPE
    SYNTAX SnaControlPointName
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Administratively assigned network name for this node."

    ::= { appnGeneralInfoAndCaps 1 }

```

```

-- appnNodeMibVersion OBJECT-TYPE (deprecated:  moved to end of module)

```

```

appnNodeId OBJECT-TYPE
    SYNTAX SnaNodeIdentification
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This node's Node Identification, which it sends in bytes
        2-5 of XID."

    ::= { appnGeneralInfoAndCaps 3 }

```

```

appnNodeType OBJECT-TYPE
    SYNTAX INTEGER {
        networkNode(1),
        endNode(2),
        t21len(4)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Type of APPN node:

        networkNode(1) - APPN network node
        endNode(2)      - APPN end node
        t21len(4)       - LEN end node

```

Note: A branch network node SHALL return endNode(2)
as the value of this object. A management application

can distinguish between a branch network node and an actual end node by retrieving the appnNodeBrNn object."

```
::= { appnGeneralInfoAndCaps 4 }
```

appnNodeUpTime OBJECT-TYPE

SYNTAX TimeTicks

UNITS "hundredths of a second"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Amount of time (in hundredths of a second) since the APPN node was last reinitialized."

```
::= { appnGeneralInfoAndCaps 5 }
```

appnNodeParallelTg OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this node supports parallel TGs."

```
::= { appnGeneralInfoAndCaps 6 }
```

appnNodeAdaptiveBindPacing OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this node supports adaptive bind pacing for dependent LUs."

```
::= { appnGeneralInfoAndCaps 7 }
```

appnNodeHprSupport OBJECT-TYPE

SYNTAX INTEGER {

noHprSupport(1),

hprBaseOnly(2),

rtpTower(3),

controlFlowsOverRtpTower(4)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates this node's level of support for high-performance routing (HPR):

noHprSupport(1)	- no HPR support
hprBaseOnly(2)	- HPR base (option set 1400) supported
rtpTower(3)	- HPR base and RTP tower (option set 1401) supported
controlFlowsOverRtpTower(4)	- HPR base, RTP tower, and control flows over RTP (option set 1402) supported

This object corresponds to cv4580, byte 9, bits 3-4."

::= { appnGeneralInfoAndCaps 8 }

appnNodeMaxSessPerRtpConn OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object represents a configuration parameter indicating the maximum number of sessions that the APPN node is to put on any HPR connection. The value is zero if not applicable."

::= { appnGeneralInfoAndCaps 9 }

appnNodeHprIntRteSetups OBJECT-TYPE

SYNTAX AppnNodeCounter

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of HPR route setups received for routes passing through this node since the node was last reinitialized."

::= { appnGeneralInfoAndCaps 10 }

appnNodeHprIntRteRejects OBJECT-TYPE

SYNTAX AppnNodeCounter

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of HPR route setups rejected by this node for routes passing through it since the node was last reinitialized."

::= { appnGeneralInfoAndCaps 11 }

appnNodeHprOrgRteSetups OBJECT-TYPE

SYNTAX AppnNodeCounter

MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The total number of HPR route setups sent for routes
originating in this node since the node was last
reinitialized."

::= { appnGeneralInfoAndCaps 12 }

appnNodeHprOrgRteRejects OBJECT-TYPE

SYNTAX AppnNodeCounter
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The number of HPR route setups rejected by other nodes for
routes originating in this node since the node was last
reinitialized."

::= { appnGeneralInfoAndCaps 13 }

appnNodeHprEndRteSetups OBJECT-TYPE

SYNTAX AppnNodeCounter
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The total number of HPR route setups received for routes
ending in this node since the node was last reinitialized."

::= { appnGeneralInfoAndCaps 14 }

appnNodeHprEndRteRejects OBJECT-TYPE

SYNTAX AppnNodeCounter
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The number of HPR route setups rejected by this node for
routes ending in it since the node was last reinitialized."

::= { appnGeneralInfoAndCaps 15 }

appnNodeCounterDisconTime OBJECT-TYPE

SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The value of the sysUpTime object the last time the APPN node
was reinitialized."

```
::= { appnGeneralInfoAndCaps 16 }
```

```
appnNodeLsCounterType OBJECT-TYPE
```

```
SYNTAX INTEGER {
    other(1),
    noAnr(2),
    anrForLocalNces(3),
    allAnr(4)
}
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

"Indicates which ANR traffic, if any, the node includes in the counts returned by the APPN link station counters appnLsInXidBytes, appnLsInMsgBytes, appnLsInXidFrames, appnLsInMsgFrames, appnLsOutXidBytes, appnLsOutMsgBytes, appnLsOutXidFrames, and appnLsOutMsgFrames. These counters are always incremented for ISR traffic.

The following values are defined:

- | | |
|--------------------|--|
| other(1) | - the node does something different from all the options listed below |
| noAnr(2) | - the node does not include any ANR traffic in these counts |
| anrForLocalNces(3) | - the node includes in these counts ANR traffic for RTP connections that terminate in this node, but not ANR traffic for RTP connections that pass through this node without terminating in it |
| allAnr(4) | - the node includes all ANR traffic in these counts." |

```
::= { appnGeneralInfoAndCaps 17 }
```

```
appnNodeBrNn OBJECT-TYPE
```

```
SYNTAX TruthValue
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

"Indicates whether this node is currently configured as a branch network node.

Note: throughout the remainder of this MIB module, branch network node is treated as a third node type, parallel to network node and end node. This is not how branch network nodes are treated in the base APPN architecture, but it

increases clarity to do it here."

```
::= { appnGeneralInfoAndCaps 18 }
```

```
-- *****
-- APPN Network Node Information
-- This section provides global information about an APPN network node.
-- *****
```

appnNodeNnCentralDirectory OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this node supports central directory services.

This object corresponds to cv4580, byte 8, bit 1."

```
::= { appnNnUniqueInfoAndCaps 1 }
```

appnNodeNnTreeCache OBJECT-TYPE

SYNTAX INTEGER {

noCache(1),

cacheNoIncrUpdate(2),

cacheWithIncrUpdate(3)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates this node's level of support for caching of route trees. Three levels are specified:

noCache(1)	- caching of route trees is not supported
cacheNoIncrUpdate(2)	- caching of route trees is supported, but without incremental updates
cacheWithIncrUpdate(3)	- caching of route trees with incremental updates is supported"

```
::= { appnNnUniqueInfoAndCaps 2 }
```

appnNodeNnRouteAddResist OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Route addition resistance.

This administratively assigned value indicates the relative desirability of using this node for intermediate session traffic. The value, which can be any integer 0-255, is used in route computation. The lower the value, the more desirable the node is for intermediate routing.

This object corresponds to cv4580, byte 6."

::= { appnNnUniqueInfoAndCaps 3 }

appnNodeNnIsr OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the node supports intermediate session routing.

This object corresponds to cv4580, byte 8, bit 2."

::= { appnNnUniqueInfoAndCaps 4 }

appnNodeNnFrsn OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The last flow-reduction sequence number (FRSN) sent by this node in a topology update to an adjacent network node."

::= { appnNnUniqueInfoAndCaps 5 }

appnNodeNnPeriBorderSup OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this node has peripheral border node support.

This object corresponds to cv4580, byte 9, bit 0."

::= { appnNnUniqueInfoAndCaps 6 }

appnNodeNnInterchangeSup OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only
STATUS current
DESCRIPTION

"Indicates whether this node has interchange node support.

This object corresponds to cv4580, byte 9, bit 1."

::= { appnNnUniqueInfoAndCaps 7 }

appnNodeNnExteBorderSup OBJECT-TYPE

SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"Indicates whether this node has extended border node support.

This object corresponds to cv4580, byte 9, bit 2."

::= { appnNnUniqueInfoAndCaps 8 }

appnNodeNnSafeStoreFreq OBJECT-TYPE

SYNTAX INTEGER (0..32767)
UNITS "TDUs"
MAX-ACCESS read-write
STATUS current
DESCRIPTION

"The topology safe store frequency.

If this number is not zero, then the topology database is saved each time the total number of topology database updates (TDUs) received by this node increases by this number. A value of zero indicates that the topology database is not being saved."

::= { appnNnUniqueInfoAndCaps 9 }

appnNodeNnRsn OBJECT-TYPE

SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"Resource sequence number for this node, which it assigns and controls.

This object corresponds to the numeric value in cv4580, bytes 2-5."

::= { appnNnUniqueInfoAndCaps 10 }

appnNodeNnCongested OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this node is congested. Other network nodes stop routing traffic to this node while this flag is on.

This object corresponds to cv4580, byte 7, bit 0."

::= { appnNnUniqueInfoAndCaps 11 }

appnNodeNnIsrDepleted OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicate whether intermediated session routing resources are depleted. Other network nodes stop routing traffic through this node while this flag is on.

This object corresponds to cv4580, byte 7, bit 1."

::= { appnNnUniqueInfoAndCaps 12 }

appnNodeNnQuiescing OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the node is quiescing.

This object corresponds to cv4580, byte 7, bit 5."

::= { appnNnUniqueInfoAndCaps 13 }

appnNodeNnGateway OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the node has gateway services support.

This object corresponds to cv4580, byte 8, bit 0."

::= { appnNnUniqueInfoAndCaps 14 }

-- *****

```
-- APPN End Node Information
-- This section provides global information about an APPN end node.  Two
-- of the objects are also implemented by a branch network node.
-- *****

appnNodeEnModeCosMap OBJECT-TYPE
    SYNTAX TruthValue
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Indicates whether this end node supports mode name to COS name
        mapping."

    ::= { appnEnUniqueCaps 1 }

appnNodeEnNnServer OBJECT-TYPE
    SYNTAX OCTET STRING (SIZE (0 | 3..17))
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The fully qualified name of the current NN server for this end
        node.  An NN server is identified using the format specified in
        the SnaControlPointName textual convention.  The value is a
        zero-length string when there is no active NN server.

        A branch network node shall also implement this object."

    ::= { appnEnUniqueCaps 2 }

appnNodeEnLuSearch OBJECT-TYPE
    SYNTAX TruthValue
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Indicates whether the node is to be searched for LUs as part
        of a network broadcast search.

        A branch network node shall also implement this object."

    ::= { appnEnUniqueCaps 3 }

-- *****
-- APPN Port information
-- This section provides information about an APPN node's ports.
-- *****
```

appnPortTable OBJECT-TYPE

SYNTAX SEQUENCE OF AppnPortEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The Port table describes the configuration and current status of the ports used by APPN. When it is known to the APPN component, an OBJECT IDENTIFIER pointing to additional information related to the port is included. This may, but need not, be a RowPointer to an ifTable entry for a DLC interface immediately 'below' the port."

```
::= { appnPortInformation 1 }
```

appnPortEntry OBJECT-TYPE

SYNTAX AppnPortEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The port name is used as the index to this table."

INDEX

```
{ appnPortName }
```

```
::= { appnPortTable 1 }
```

AppnPortEntry ::= SEQUENCE {

appnPortName	DisplayString,
appnPortCommand	INTEGER,
appnPortOperState	INTEGER,
appnPortDlcType	IANAifType,
appnPortPortType	INTEGER,
appnPortSIMRIM	TruthValue,
appnPortLsRole	INTEGER,
appnPortNegotLs	TruthValue,
appnPortDynamicLinkSupport	TruthValue,
appnPortMaxRcvBtuSize	INTEGER,
appnPortMaxIframeWindow	Gauge32,
appnPortDefLsGoodXids	AppnPortCounter,
appnPortDefLsBadXids	AppnPortCounter,
appnPortDynLsGoodXids	AppnPortCounter,
appnPortDynLsBadXids	AppnPortCounter,
appnPortSpecific	RowPointer,
appnPortDlcLocalAddr	DisplayableDlcAddress,
appnPortCounterDisconTime	TimeStamp

```
}
```

appnPortName OBJECT-TYPE

SYNTAX DisplayString (SIZE (1..10))
 MAX-ACCESS not-accessible
 STATUS current

DESCRIPTION

"Administratively assigned name for this APPN port."

::= { appnPortEntry 1 }

appnPortCommand OBJECT-TYPE

SYNTAX INTEGER {
 deactivate(1),
 activate(2),
 recycle(3),
 ready(4)
 }

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Object by which a Management Station can activate, deactivate, or recycle (i.e., cause to be deactivated and then immediately activated) a port, by setting the value to activate(1), deactivate(2), or recycle(3), respectively. The value ready(4) is returned on GET operations until a SET has been processed; after that the value received on the most recent SET is returned."

::= { appnPortEntry 2 }

appnPortOperState OBJECT-TYPE

SYNTAX INTEGER {
 inactive(1),
 pendactive(2),
 active(3),
 pendinact(4)
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the current state of this port:

inactive(1) - port is inactive
 pendactive(2) - port is pending active
 active(3) - port is active
 pendinact(4) - port is pending inactive"

::= { appnPortEntry 3 }

```
appnPortDlcType OBJECT-TYPE
    SYNTAX IANAIfType
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The type of DLC interface, distinguished according to the
        protocol immediately 'below' this layer."

    ::= { appnPortEntry 4 }

appnPortPortType OBJECT-TYPE
    SYNTAX INTEGER {
        leased(1),
        switched(2),
        sharedAccessFacilities(3)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Identifies the type of line used by this port:

        leased(1)                - leased line
        switched(2)              - switched line
        sharedAccessFacilities(3) - shared access facility, such
                                as a LAN."

    ::= { appnPortEntry 5 }

appnPortSIMRIM OBJECT-TYPE
    SYNTAX TruthValue
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Indicates whether Set Initialization Mode (SIM) and Receive
        Initialization Mode (RIM) are supported for this port."

    ::= { appnPortEntry 6 }

appnPortLsRole OBJECT-TYPE
    SYNTAX INTEGER {
        primary(1),
        secondary(2),
        negotiable(3),
        abm(4)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
```

"Initial role for link stations activated through this port. The values map to the following settings in the initial XID, where 'ABM' indicates asynchronous balanced mode and 'NRM' indicated normal response mode:

primary(1):	ABM support = 0	(= NRM)
	role = 01	(= primary)
secondary(2):	ABM support = 0	(= NRM)
	role = 00	(= secondary)
negotiable(3):	ABM support = 0	(= NRM)
	role = 11	(= negotiable)
abm(4):	ABM support = 1	(= ABM)
	role = 11	(= negotiable)"

::= { appnPortEntry 7 }

appnPortNegotLs OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the node supports negotiable link stations for this port."

::= { appnPortEntry 8 }

appnPortDynamicLinkSupport OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this node allows call-in on this port from nodes not defined locally."

::= { appnPortEntry 9 }

appnPortMaxRcvBtuSize OBJECT-TYPE

SYNTAX INTEGER (99..32767)

UNITS "bytes"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Maximum Basic Transmission Unit (BTU) size that a link station on this port can receive.

This object corresponds to bytes 21-22 of XID3."

::= { appnPortEntry 10 }

appnPortMaxIframeWindow OBJECT-TYPE

SYNTAX Gauge32

UNITS "I-frames"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Maximum number of I-frames that can be received by the XID sender before an acknowledgement is received."

::= { appnPortEntry 11 }

appnPortDefLsGoodXids OBJECT-TYPE

SYNTAX AppnPortCounter

UNITS "XID exchanges"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of successful XID exchanges that have occurred on all defined link stations on this port since the last time this port was started."

::= { appnPortEntry 12 }

appnPortDefLsBadXids OBJECT-TYPE

SYNTAX AppnPortCounter

UNITS "XID exchanges"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of unsuccessful XID exchanges that have occurred on all defined link stations on this port since the last time this port was started."

::= { appnPortEntry 13 }

appnPortDynLsGoodXids OBJECT-TYPE

SYNTAX AppnPortCounter

UNITS "XID exchanges"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of successful XID exchanges that have occurred on all dynamic link stations on this port since the last time this port was started."

::= { appnPortEntry 14 }

appnPortDynLsBadXids OBJECT-TYPE

SYNTAX AppnPortCounter
 UNITS "XID exchanges"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION

"The total number of unsuccessful XID exchanges that have occurred on all dynamic link stations on this port since the last time this port was started."

::= { appnPortEntry 15 }

appnPortSpecific OBJECT-TYPE

SYNTAX RowPointer
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION

"Identifies the object, e.g., one in a DLC-specific MIB, that can provide additional information related to this port."

If the agent is unable to identify such an object, the value 0.0 is returned."

::= { appnPortEntry 16 }

appnPortDlcLocalAddr OBJECT-TYPE

SYNTAX DisplayableDlcAddress
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION

"Local DLC address of this port."

::= { appnPortEntry 17 }

appnPortCounterDisconTime OBJECT-TYPE

SYNTAX TimeStamp
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION

"The value of the sysUpTime object the last time the port was started."

::= { appnPortEntry 18 }

```
-- *****
-- APPN Link Station Information
-- This section provides information about an APPN node's link stations.
-- *****
```

```

appnLsTable OBJECT-TYPE
    SYNTAX SEQUENCE OF AppnLsEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table contains detailed information about the link
        station configuration and its current status."

    ::= { appnLinkStationInformation 1 }

appnLsEntry OBJECT-TYPE
    SYNTAX AppnLsEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table is indexed by the link station name."

    INDEX
        { appnLsName }

    ::= { appnLsTable 1 }

AppnLsEntry ::= SEQUENCE {
    appnLsName                DisplayString,
    appnLsCommand              INTEGER,
    appnLsOperState            INTEGER,

    appnLsPortName             DisplayString,
    appnLsDlcType              IANAIfType,
    appnLsDynamic              TruthValue,

    appnLsAdjCpName            OCTET STRING,
    appnLsAdjNodeType           INTEGER,
    appnLsTgNum                INTEGER,
    appnLsLimResource          TruthValue,
    appnLsActOnDemand           TruthValue,
    appnLsMigration            TruthValue,
    appnLsPartnerNodeId        SnaNodeIdentification,
    appnLsCpCpSessionSupport   TruthValue,

    appnLsMaxSendBtuSize       INTEGER,
    -- performance data
    appnLsInXidBytes           AppnLinkStationCounter,
    appnLsInMsgBytes           AppnLinkStationCounter,
    appnLsInXidFrames          AppnLinkStationCounter,
    appnLsInMsgFrames          AppnLinkStationCounter,
    appnLsOutXidBytes           AppnLinkStationCounter,
    appnLsOutMsgBytes           AppnLinkStationCounter,

```

```

        appnLsOutXidFrames          AppnLinkStationCounter,
        appnLsOutMsgFrames          AppnLinkStationCounter,
-- propagation delay
        appnLsEchoRspS              AppnLinkStationCounter,
        appnLsCurrentDelay          Gauge32,
        appnLsMaxDelay              Gauge32,
        appnLsMinDelay              Gauge32,
        appnLsMaxDelayTime          DateAndTime,
-- XID Statistics
        appnLsGoodXids              AppnLinkStationCounter,
        appnLsBadXids               AppnLinkStationCounter,
-- DLC-specific
        appnLsSpecific              RowPointer,
        appnLsActiveTime            Unsigned32,
        appnLsCurrentStateTime      TimeTicks,
-- HPR-specific
        appnLsHprSup                INTEGER,
        appnLsErrRecoSup            TruthValue,
        appnLsForAnrLabel           OCTET STRING,
        appnLsRevAnrLabel           OCTET STRING,
        appnLsCpCpNceId             OCTET STRING,
        appnLsRouteNceId            OCTET STRING,
        appnLsBfNceId              OCTET STRING,

        appnLsLocalAddr             DisplayableDlcAddress,
        appnLsRemoteAddr            DisplayableDlcAddress,
        appnLsRemoteLsName          DisplayString,
        appnLsCounterDisconTime     TimeStamp,
        appnLsMltgMember            TruthValue
    }

appnLsName OBJECT-TYPE
    SYNTAX DisplayString (SIZE (1..10))
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Administratively assigned name for the link station.
        The name can be from one to ten characters."

    ::= { appnLsEntry 1 }

appnLsCommand OBJECT-TYPE
    SYNTAX INTEGER {
        deactivate(1),
        activate(2),
        recycle(3),
        ready(4)
    }

```

MAX-ACCESS read-write
 STATUS current
 DESCRIPTION

"Object by which a Management Station can activate, deactivate, or recycle (i.e., cause to be deactivated and then immediately reactivated) a link station, by setting the value to activate(1), deactivate(2), or recycle(3), respectively. The value ready(4) is returned on GET operations until a SET has been processed; after that the value received on the most recent SET is returned."

::= { appnLsEntry 2 }

appnLsOperState OBJECT-TYPE

SYNTAX INTEGER {
 inactive(1),
 sentConnectOut(2), -- pending active
 pendXidExch(3), -- pending active
 sendActAs(4), -- pending active
 sendSetMode(5), -- pending active
 otherPendingActive(6), -- pending active
 active(7),
 sentDeactAsOrd(8), -- pending inactive
 sentDiscOrd(9), -- pending inactive
 sentDiscImmed(10), -- pending inactive
 otherPendingInact(11) -- pending inactive
 }

MAX-ACCESS read-only
 STATUS current
 DESCRIPTION

"State of this link station. The comments map these more granular states to the 'traditional' four states for SNA resources. Values (2) through (5) represent the normal progression of states when a link station is being activated. Value (6) represents some other state of a link station in the process of being activated. Values (8) through (10) represent different ways a link station can be deactivated. Value (11) represents some other state of a link station in the process of being deactivated."

::= { appnLsEntry 3 }

appnLsPortName OBJECT-TYPE

SYNTAX DisplayString (SIZE (1..10))
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION

"Administratively assigned name for the port associated with

this link station. The name can be from one to ten characters."

::= { appnLsEntry 4 }

appnLsDlcType OBJECT-TYPE

SYNTAX IANAIfType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The type of DLC interface, distinguished according to the protocol immediately 'below' this layer."

::= { appnLsEntry 5 }

appnLsDynamic OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Identifies whether this is a dynamic link station. Dynamic link stations are created when links that have not been locally defined are established by adjacent nodes."

::= { appnLsEntry 6 }

appnLsAdjCpName OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0 | 3..17))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Fully qualified name of the adjacent node for this link station. An adjacent node is identified using the format specified in the SnaControlPointName textual convention.

The value of this object is determined as follows:

1. If the adjacent node's name was received on XID, it is returned.
2. If the adjacent node's name was not received on XID, but a locally-defined value is available, it is returned.
3. Otherwise a string of length 0 is returned, indicating that no name is known for the adjacent node."

::= { appnLsEntry 7 }

appnLsAdjNodeType OBJECT-TYPE

```

SYNTAX INTEGER {
    networkNode(1),
    endNode(2),
    t21len(4),
    unknown(255)
}

```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Node type of the adjacent node on this link:

```

networkNode(1) - APPN network node
endNode(2)      - APPN end node
t21len(4)       - LEN end node
unknown(255)    - the agent does not know the node type
                  of the adjacent node

```

"

```
 ::= { appnLsEntry 8 }

```

appnLsTgNum OBJECT-TYPE

```

SYNTAX INTEGER (0..256)

```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number associated with the TG to this link station, with a range from 0 to 256. A value of 256 indicates that the TG number has not been negotiated and is unknown at this time."

```
 ::= { appnLsEntry 9 }

```

appnLsLimResource OBJECT-TYPE

```

SYNTAX TruthValue

```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the link station is a limited resource. A link station that is a limited resource is deactivated when it is no longer in use."

```
 ::= { appnLsEntry 10 }

```

appnLsActOnDemand OBJECT-TYPE

```

SYNTAX TruthValue

```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the link station is activatable on demand.

Such a link station is reported in the topology as active regardless of its actual state, so that it can be considered in route calculations. If the link station is inactive and is chosen for a route, it will be activated at that time."

```
::= { appnLsEntry 11 }
```

appnLsMigration OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this link station will be used for connections to down-level or migration partners.

In general, migration nodes do not append their CP names on XID3. Such nodes: (1) will not support parallel TGs, (2) should be sent an ACTIVATE PHYSICAL UNIT (ACTPU), provided that the partner supports ACTPUs, and (3) should not be sent segmented BINDs. However, if this node receives an XID3 with an appended CP name, then the partner node will not be treated as a migration node.

In the case of DYNAMIC TGs this object should be set to 'no'."

```
::= { appnLsEntry 12 }
```

appnLsPartnerNodeId OBJECT-TYPE

SYNTAX SnaNodeIdentification

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The partner's Node Identification, from bytes 2-5 of the XID received from the partner. If this value is not available, then the characters '00000000' are returned."

```
::= { appnLsEntry 13 }
```

appnLsCpCpSessionSupport OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether CP-CP sessions are supported by this link station. For a dynamic link, this object represents the default ('Admin') value."

::= { appnLsEntry 14 }

appnLsMaxSendBtuSize OBJECT-TYPE

SYNTAX INTEGER (99..32767)

UNITS "bytes"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Numeric value between 99 and 32767 inclusive indicating the maximum number of bytes in a Basic Transmission Unit (BTU) sent on this link.

When the link state (returned by the appnLsOperState object) is inactive or pending active, the value configured at this node is returned. When the link state is active, the value that was negotiated for it is returned. This negotiated value is the smaller of the value configured at this node and the partner's maximum receive BTU length, received in XID."

::= { appnLsEntry 15 }

appnLsInXidBytes OBJECT-TYPE

SYNTAX AppnLinkStationCounter

UNITS "bytes"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of XID bytes received. All of the bytes in the SNA basic transmission unit (BTU), i.e., all of the bytes in the DLC XID Information Field, are counted."

::= { appnLsEntry 16 }

appnLsInMsgBytes OBJECT-TYPE

SYNTAX AppnLinkStationCounter

UNITS "bytes"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of message (I-frame) bytes received. All of the bytes in the SNA basic transmission unit (BTU), including the transmission header (TH), are counted."

::= { appnLsEntry 17 }

appnLsInXidFrames OBJECT-TYPE

SYNTAX AppnLinkStationCounter

UNITS "XID frames"

MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Number of XID frames received."

::= { appnLsEntry 18 }

appnLsInMsgFrames OBJECT-TYPE
 SYNTAX AppnLinkStationCounter
 UNITS "I-frames"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Number of message (I-frame) frames received."

::= { appnLsEntry 19 }

appnLsOutXidBytes OBJECT-TYPE
 SYNTAX AppnLinkStationCounter
 UNITS "bytes"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Number of XID bytes sent. All of the bytes in the SNA basic
 transmission unit (BTU), i.e., all of the bytes in the DLC XID
 Information Field, are counted."

::= { appnLsEntry 20 }

appnLsOutMsgBytes OBJECT-TYPE
 SYNTAX AppnLinkStationCounter
 UNITS "bytes"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Number of message (I-frame) bytes sent. All of the bytes
 in the SNA basic transmission unit (BTU), including the
 transmission header (TH), are counted."

::= { appnLsEntry 21 }

appnLsOutXidFrames OBJECT-TYPE
 SYNTAX AppnLinkStationCounter
 UNITS "XID frames"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Number of XID frames sent."

::= { appnLsEntry 22 }

appnLsOutMsgFrames OBJECT-TYPE

SYNTAX AppnLinkStationCounter

UNITS "I-frames"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of message (I-frame) frames sent."

::= { appnLsEntry 23 }

appnLsEchoRsps OBJECT-TYPE

SYNTAX AppnLinkStationCounter

UNITS "echo responses"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of echo responses returned from adjacent link station. A response should be returned for each test frame sent by this node. Test frames are sent to adjacent nodes periodically to verify connectivity and to measure the actual round trip time, that is, the time interval from when the test frame is sent until when the response is received."

::= { appnLsEntry 24 }

appnLsCurrentDelay OBJECT-TYPE

SYNTAX Gauge32

UNITS "milliseconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time that it took for the last test signal to be sent and returned from this link station to the adjacent link station. This time is represented in milliseconds."

::= { appnLsEntry 25 }

appnLsMaxDelay OBJECT-TYPE

SYNTAX Gauge32

UNITS "milliseconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The longest time it took for a test signal to be sent and returned from this link station to the adjacent link station."

This time is represented in milliseconds .

The value 0 is returned if no test signal has been sent and returned."

::= { appnLsEntry 26 }

appnLsMinDelay OBJECT-TYPE

SYNTAX Gauge32

UNITS "milliseconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The shortest time it took for a test signal to be sent and returned from this link station to the adjacent link station. This time is represented in milliseconds.

The value 0 is returned if no test signal has been sent and returned."

::= { appnLsEntry 27 }

appnLsMaxDelayTime OBJECT-TYPE

SYNTAX DateAndTime

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time when the longest delay occurred. This time can be used to identify when this high water mark occurred in relation to other events in the APPN node, for example, the time at which an APPC session was either terminated or failed to be established. This latter time is available in the appcHistSessTime object in the APPC MIB.

The value 00000000 is returned if no test signal has been sent and returned."

::= { appnLsEntry 28 }

appnLsGoodXids OBJECT-TYPE

SYNTAX AppnLinkStationCounter

UNITS "XID exchanges"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of successful XID exchanges that have occurred on this link station since the time it was started."

::= { appnLsEntry 29 }

appnLsBadXids OBJECT-TYPE

SYNTAX AppnLinkStationCounter

UNITS "XID exchanges"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of unsuccessful XID exchanges that have occurred on this link station since the time it was started."

::= { appnLsEntry 30 }

appnLsSpecific OBJECT-TYPE

SYNTAX RowPointer

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Identifies the object, e.g., one in a DLC-specific MIB, that can provide additional information related to this link station.

If the agent is unable to identify such an object, the value 0.0 is returned."

::= { appnLsEntry 31 }

appnLsActiveTime OBJECT-TYPE

SYNTAX Unsigned32

UNITS "hundredths of a second"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The cumulative amount of time since the node was last reinitialized, measured in hundredths of a second, that this link station has been in the active state. A zero value indicates that the link station has never been active since the node was last reinitialized."

::= { appnLsEntry 32 }

appnLsCurrentStateTime OBJECT-TYPE

SYNTAX TimeTicks

UNITS "hundredths of a second"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The amount of time, measured in hundredths of a second, that

the link station has been in its current state."

::= { appnLsEntry 33 }

appnLsHprSup OBJECT-TYPE

SYNTAX INTEGER {
 noHprSupport(1),
 hprBaseOnly(2),
 rtpTower(3),
 controlFlowsOverRtpTower(4)
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the level of high performance routing (HPR) support over this link:

noHprSupport(1)	- no HPR support
hprBaseOnly(2)	- HPR base (option set 1400) supported
rtpTower(3)	- HPR base and RTP tower (option set 1401) supported
controlFlowsOverRtpTower(4)	- HPR base, RTP tower, and control flows over RTP (option set 1402) supported

If the link is not active, the defined value is returned."

::= { appnLsEntry 34 }

appnLsErrRecoSup OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the link station is supporting HPR link-level error recovery."

::= { appnLsEntry 35 }

appnLsForAnrLabel OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0..8))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The forward Automatic Network Routing (ANR) label for this link station. If the link does not support HPR or the value is unknown, a zero-length string is returned."

```
::= { appnLsEntry 36 }
```

appnLsRevAnrLabel OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0..8))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The reverse Automatic Network Routing (ANR) label for this link station. If the link does not support HPR or the value is unknown, a zero-length string is returned."

```
::= { appnLsEntry 37 }
```

appnLsCpCpNceId OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0..8))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The network connection endpoint identifier (NCE ID) for CP-CP sessions if this node supports the HPR transport tower, a zero-length string if the value is unknown or not meaningful for this node."

```
::= { appnLsEntry 38 }
```

appnLsRouteNceId OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0..8))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The network connection endpoint identifier (NCE ID) for Route Setup if this node supports the HPR transport tower, a zero-length string if the value is unknown or not meaningful for this node."

```
::= { appnLsEntry 39 }
```

appnLsBfNceId OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (0..8))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The network connection endpoint identifier (NCE ID) for the APPN/HPR boundary function if this node supports the HPR transport tower, a zero-length string if the value is unknown or not meaningful for this node."

```
::= { appnLsEntry 40 }
```

appnLsLocalAddr OBJECT-TYPE
SYNTAX DisplayableDlcAddress
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Local address of this link station."

 ::= { appnLsEntry 41 }

appnLsRemoteAddr OBJECT-TYPE
SYNTAX DisplayableDlcAddress
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Address of the remote link station on this link."

 ::= { appnLsEntry 42 }

appnLsRemoteLsName OBJECT-TYPE
SYNTAX DisplayString (SIZE (0..10))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Remote link station discovered from the XID exchange.
 The name can be from one to ten characters. A zero-length
 string indicates that the value is not known."

 ::= { appnLsEntry 43 }

appnLsCounterDisconTime OBJECT-TYPE
SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "The value of the sysUpTime object the last time the link
 station was started."

 ::= { appnLsEntry 44 }

appnLsMltgMember OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Indicates whether the link is a member of a multi-link TG. If
 the link's TG has been brought up as a multi-link TG, then the
 link is reported as a member of a multi-link TG, even if it is

currently the only active link in the TG."

```
::= { appnLsEntry 45 }
```

```
--*****
-- This table provides information about errors this node encountered
-- with connections to adjacent nodes. Entries are added for exceptional
-- conditions encountered establishing connections, and for exceptional
-- conditions that resulted in termination of a connection. It is an
-- implementation option when entries are removed from this table.
--*****
```

appnLsStatusTable OBJECT-TYPE

SYNTAX SEQUENCE OF AppnLsStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains information related to exceptional and potentially exceptional conditions that occurred during the activation, XID exchange, and termination of a connection. No entries are created when these activities proceed normally.

It is an implementation option when entries are removed from this table."

```
::= { appnLinkStationInformation 2 }
```

appnLsStatusEntry OBJECT-TYPE

SYNTAX AppnLsStatusEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table is indexed by the LsStatusIndex, which is an integer that is continuously updated until it eventually wraps."

INDEX

```
{ appnLsStatusIndex }
```

```
::= { appnLsStatusTable 1 }
```

AppnLsStatusEntry ::= SEQUENCE {

appnLsStatusIndex

INTEGER,

appnLsStatusTime

DateAndTime,

appnLsStatusLsName

DisplayString,

appnLsStatusCpName

DisplayString,

appnLsStatusPartnerId	SnaNodeIdentification,
appnLsStatusTgNum	INTEGER,
appnLsStatusGeneralSense	SnaSenseData,
appnLsStatusRetry	TruthValue,
appnLsStatusEndSense	SnaSenseData,
appnLsStatusXidLocalSense	SnaSenseData,
appnLsStatusXidRemoteSense	SnaSenseData,
appnLsStatusXidByteInError	INTEGER,
appnLsStatusXidBitInError	INTEGER,
appnLsStatusDlcType	IANAIfType,
appnLsStatusLocalAddr	DisplayableDlcAddress,
appnLsStatusRemoteAddr	DisplayableDlcAddress
}	

appnLsStatusIndex OBJECT-TYPE

SYNTAX INTEGER (0..2147483647)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Table index. The value of the index begins at zero and is incremented up to a maximum value of 2**31-1 (2,147,483,647) before wrapping."

::= { appnLsStatusEntry 1 }

appnLsStatusTime OBJECT-TYPE

SYNTAX DateAndTime

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Time when the exception condition occurred. This time can be used to identify when this event occurred in relation to other events in the APPN node, for example, the time at which an APPC session was either terminated or failed to be established. This latter time is available in the appcHistSessTime object in the APPC MIB."

::= { appnLsStatusEntry 2 }

appnLsStatusLsName OBJECT-TYPE

SYNTAX DisplayString (SIZE (1..10))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Administratively assigned name for the link station experiencing the condition."

::= { appnLsStatusEntry 3 }

appnLsStatusCpName OBJECT-TYPE

SYNTAX DisplayString (SIZE (0 | 3..17))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Fully qualified name of the adjacent node for this link station. An adjacent node is identified using the format specified in the SnaControlPointName textual convention.

The value of this object is determined as follows:

1. If the adjacent node's name was received on XID, it is returned.
2. If the adjacent node's name was not received on XID, but a locally-defined value is available, it is returned.
3. Otherwise a string of length 0 is returned, indicating that no name is known for the adjacent node."

::= { appnLsStatusEntry 4 }

appnLsStatusPartnerId OBJECT-TYPE

SYNTAX SnaNodeIdentification

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The partner's Node Identification, from bytes 2-5 of the XID received from the partner. If this value is not available, then the characters '00000000' are returned."

::= { appnLsStatusEntry 5 }

appnLsStatusTgNum OBJECT-TYPE

SYNTAX INTEGER (0..256)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number associated with the TG to this link station, with a range from 0 to 256. A value of 256 indicates that the TG number was unknown at the time of the failure."

::= { appnLsStatusEntry 6 }

appnLsStatusGeneralSense OBJECT-TYPE

SYNTAX SnaSenseData
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The error sense data associated with the start sequence of activation of a link up to the beginning of the XID sequence.

This is the sense data that came from Configuration Services whenever the link did not activate or when it went inactive."

::= { appnLsStatusEntry 7 }

appnLsStatusRetry OBJECT-TYPE

SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"Indicates whether the node will retry the start request to activate the link."

::= { appnLsStatusEntry 8 }

appnLsStatusEndSense OBJECT-TYPE

SYNTAX SnaSenseData
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The sense data associated with the termination of the link connection to adjacent node.

This is the sense data that came from the DLC layer."

::= { appnLsStatusEntry 9 }

appnLsStatusXidLocalSense OBJECT-TYPE

SYNTAX SnaSenseData
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The sense data associated with the rejection of the XID.

This is the sense data that came from the local node (this node) when it built the XID Negotiation Error control vector (cv22) to send to the remote node."

::= { appnLsStatusEntry 10 }

appnLsStatusXidRemoteSense OBJECT-TYPE

SYNTAX SnaSenseData
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The sense data the adjacent node returned to this node indicating the reason the XID was rejected.

This is the sense data that came from the remote node in the XID Negotiation Error control vector (cv22) it sent to the local node (this node)."

::= { appnLsStatusEntry 11 }

appnLsStatusXidByteInError OBJECT-TYPE
SYNTAX INTEGER (0..65536)
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"This object identifies the actual byte in the XID that caused the error. The value 65536 indicates that the object has no meaning.

For values in the range 0-65535, this object corresponds to bytes 2-3 of the XID Negotiation (X'22') control vector."

::= { appnLsStatusEntry 12 }

appnLsStatusXidBitInError OBJECT-TYPE
SYNTAX INTEGER (0..8)
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"This object identifies the actual bit in error (0 through 7) within the errored byte of the XID. The value 8 indicates that this object has no meaning.

For values in the range 0-7, this object corresponds to byte 4 of the XID Negotiation (X'22') control vector."

::= { appnLsStatusEntry 13 }

appnLsStatusDlcType OBJECT-TYPE
SYNTAX IANAIfType
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The type of DLC interface, distinguished according to the protocol immediately 'below' this layer."

```
::= { appnLsStatusEntry 14 }
```

```
appnLsStatusLocalAddr OBJECT-TYPE
    SYNTAX DisplayableDlcAddress
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Local address of this link station."
```

```
::= { appnLsStatusEntry 15 }
```

```
appnLsStatusRemoteAddr OBJECT-TYPE
    SYNTAX DisplayableDlcAddress
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Address of the remote link station on this link."
```

```
::= { appnLsStatusEntry 16 }
```

```
-- *****
-- APPN Virtual Routing Node Information
-- This section provides information relating a virtual routing node to
-- an APPN port.
-- *****
```

```
appnVrnTable OBJECT-TYPE
    SYNTAX SEQUENCE OF AppnVrnEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table relates a virtual routing node to an APPN port."
```

```
::= { appnVrnInfo 1 }
```

```
appnVrnEntry OBJECT-TYPE
    SYNTAX AppnVrnEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table is indexed by the virtual routing node name, TG
        number, and port name. There will be a matching entry in the
        appnLocalTgTable to represent status and characteristics of the
        TG representing each virtual routing node definition."
```

```
INDEX
    { appnVrnName, appnVrnTgNum, appnVrnPortName }
```

```

 ::= { appnVrnTable 1 }

AppnVrnEntry ::= SEQUENCE {
    appnVrnName          SnaControlPointName,
    appnVrnTgNum         INTEGER,
    appnVrnPortName      DisplayString
}

appnVrnName OBJECT-TYPE
    SYNTAX SnaControlPointName
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Administratively assigned name of the virtual routing node.
        This is a fully qualified name, and matches the appnLocalTgDest
        name in the appnLocalTgTable."

 ::= { appnVrnEntry 1 }

appnVrnTgNum OBJECT-TYPE
    SYNTAX INTEGER (0..255)
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Number associated with the transmission group representing
        this virtual routing node definition."

 ::= { appnVrnEntry 2 }

appnVrnPortName OBJECT-TYPE
    SYNTAX DisplayString (SIZE (1..10))
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The name of the port this virtual routing node definition is
        defined to."

 ::= { appnVrnEntry 3 }

-- ***** The APPN Topology Group *****

appnNn          OBJECT IDENTIFIER ::= { appnObjects 2 }
appnNnTopo      OBJECT IDENTIFIER ::= { appnNn 1 }
appnNnTopology  OBJECT IDENTIFIER ::= { appnNn 2 }

-- This group is used to represent the entire APPN network-node topology
-- including network nodes, virtual routing nodes and all TGs associated
-- with these nodes, including intersubnetwork TGs (ISTGs) and branch TGs.

```

```
--
-- Network nodes
-- The APPN topology database consists of information about every APPN
-- network node in this network node's topology subnetwork. This
-- information is learned over time as each network node exchanges
-- topology information with the network nodes adjacent to it. The
-- database consists of information about each node, and information
-- about all of the transmission groups used by these nodes.
--
-- Virtual routing nodes
-- Information about virtual routing nodes (representing connection
-- networks) is treated in the same way as information about network
-- nodes, and is replicated at each network node. The FRSN, node name,
-- and node type are the only meaningful fields for a virtual routing
-- node. The other node objects return unspecified values. Each
-- node that has defined a TG with this virtual routing node as the
-- destination also defines a TG on this virtual routing node. There
-- is a TG record for each node that uses this virtual routing node.
--
-- The APPN node table represents node information from the APPN topology
-- database, with the FRSN and APPN fully qualified CP name serving as
-- the index. The FRSN is the agent's relative time stamp of an update
-- to the network topology database. After collecting the entire database
-- once, a management application can issue GET NEXT commands starting
-- from the last rows it has retrieved from the appnNnTopologyFRTTable and
-- from the appnNnTgTopologyFRTTable. When the response to either of these
-- GET NEXT commands returns another row of its respective table, this
-- indicates a change to the agent's topology database. The management
-- application can then retrieve only the updates to the table, using
-- GET NEXT commands starting from the last retrieved node or TG entry.
--
-- The format of the actual APPN topology database is as follows:
--
-- Node table (entry for each node in network)
--   TG table (entry for each TG owned by node)
--
-- Due to SNMP's ASN.1 limitations, we cannot represent the TG table
-- within the node table in this way. We define separate tables for
-- nodes and TGs, adding the node name to each TG entry to provide a
-- means of correlating the TG with its originating node.
```

appnNnTopoMaxNodes OBJECT-TYPE

SYNTAX Gauge32

UNITS "node entries"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Maximum number of node entries allowed in the APPN topology"

database. It is an implementation choice whether to count only network-node entries, or to count all node entries. If the number of node entries exceeds this value, APPN will issue an Alert and the node can no longer participate as a network node. The value 0 indicates that the local node has no defined limit, and the number of node entries is bounded only by memory."

::= { appnNnTopo 1 }

appnNnTopoCurNumNodes OBJECT-TYPE

SYNTAX Gauge32

UNITS "node entries"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Current number of node entries in this node's topology database. It is an implementation choice whether to count only network-node entries, or to count all node entries, but an implementation must make the same choice here that it makes for the appnNnTopoMaxNodes object. If this value exceeds the maximum number of nodes allowed (appnNnTopoMaxNodes, if that field is not 0), APPN Alert CPDB002 is issued."

::= { appnNnTopo 2 }

appnNnTopoNodePurges OBJECT-TYPE

SYNTAX AppnNodeCounter

UNITS "node entries"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total number of topology node records purged from this node's topology database since the node was last reinitialized."

::= { appnNnTopo 3 }

appnNnTopoTgPurges OBJECT-TYPE

SYNTAX AppnNodeCounter

UNITS "TG entries"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total number of topology TG records purged from this node's topology database since the node was last reinitialized."

::= { appnNnTopo 4 }

appnNnTopoTotalTduWars OBJECT-TYPE


```

SYNTAX AppnNodeCounter
UNITS "TDU wars"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Number of TDU wars detected by this node since its last
    initialization."

```

```
 ::= { appnNnTopo 5 }
```

```
-- APPN network node topology table (using FRSN and name as index)
```

```
-- This table describes every APPN network node and virtual routing node
-- represented in this node's topology database.
```

```

appnNnTopologyFRTable OBJECT-TYPE
    SYNTAX SEQUENCE OF AppnNnTopologyFREntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Portion of the APPN topology database that describes all of
        the APPN network nodes and virtual routing nodes known to this
        node."

```

```
 ::= { appnNnTopology 3 }
```

```

appnNnTopologyFREntry OBJECT-TYPE
    SYNTAX AppnNnTopologyFREntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "The FRSN and the fully qualified node name are used to index
        this table."

```

```

INDEX
    { appnNnNodeFRFrsn,
      appnNnNodeFRName }

```

```
 ::= { appnNnTopologyFRTable 1 }
```

```

AppnNnTopologyFREntry ::= SEQUENCE {
    appnNnNodeFRFrsn                Unsigned32,
    appnNnNodeFRName                SnaControlPointName,
    appnNnNodeFREntryTimeLeft       AppnTopologyEntryTimeLeft,
    appnNnNodeFRType                INTEGER,

```

```

    appnNnNodeFRRsn                Unsigned32,
    appnNnNodeFRRouteAddResist      INTEGER,
    appnNnNodeFRCongested           TruthValue,
    appnNnNodeFRIsrDepleted         TruthValue,
    appnNnNodeFRQuiescing           TruthValue,
    appnNnNodeFRGateway             TruthValue,
    appnNnNodeFRCentralDirectory    TruthValue,
    appnNnNodeFRIsr                 TruthValue,
    appnNnNodeFRGarbageCollect      TruthValue,

    appnNnNodeFRHprSupport          INTEGER,
    appnNnNodeFRPeriBorderSup       TruthValue,
    appnNnNodeFRInterchangeSup      TruthValue,
    appnNnNodeFRExteBorderSup       TruthValue,
    appnNnNodeFRBranchAwareness     TruthValue
}

appnNnNodeFRFrsn OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Flow reduction sequence numbers (FRSNs) are associated with
        Topology Database Updates (TDUs) and are unique only within
        each APPN network node. A TDU can be associated with multiple
        APPN resources. This FRSN indicates the last relative time
        this resource was updated at the agent node."

    ::= { appnNnTopologyFREntry 1 }

appnNnNodeFRName OBJECT-TYPE
    SYNTAX SnaControlPointName
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Administratively assigned network name that is locally defined
        at each network node."

    ::= { appnNnTopologyFREntry 2 }

appnNnNodeFREntryTimeLeft OBJECT-TYPE
    SYNTAX AppnTopologyEntryTimeLeft
    UNITS "days"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "Number of days before deletion of this network node entry."

```

```
::= { appnNnTopologyFREntry 3 }
```

```
appnNnNodeFRType OBJECT-TYPE
```

```
SYNTAX INTEGER {
    networkNode(1),
    virtualRoutingNode(3)
}
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Type of APPN node."
```

```
::= { appnNnTopologyFREntry 4 }
```

```
appnNnNodeFRRsn OBJECT-TYPE
```

```
SYNTAX Unsigned32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Resource sequence number, which is assigned and controlled by
the network node that owns this resource. An odd number
indicates that information about the resource is inconsistent.
```

```
This object corresponds to the numeric value in cv4580, bytes
2-5."
```

```
::= { appnNnTopologyFREntry 5 }
```

```
appnNnNodeFRRRouteAddResist OBJECT-TYPE
```

```
SYNTAX INTEGER (0..255)
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Route addition resistance.
```

```
This administratively assigned value indicates the relative
desirability of using this node for intermediate session
traffic. The value, which can be any integer 0-255, is used
in route computation. The lower the value, the more
desirable the node is for intermediate routing.
```

```
This object corresponds to cv4580, byte 6."
```

```
::= { appnNnTopologyFREntry 6 }
```

```
appnNnNodeFRCongested OBJECT-TYPE
```

```
SYNTAX TruthValue
```

```
MAX-ACCESS read-only
```

STATUS current

DESCRIPTION

"Indicates whether this node is congested. This node is not be included in route selection by other nodes when this congestion exists.

This object corresponds to cv4580, byte 7, bit 0."

::= { appnNnTopologyFREntry 7 }

appnNnNodeFRIsrDepleted OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether intermediate session routing resources are depleted. This node is not included in intermediate route selection by other nodes when resources are depleted.

This object corresponds to cv4580, byte 7, bit 1."

::= { appnNnTopologyFREntry 8 }

appnNnNodeFRQuiescing OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the node is quiescing. This node is not included in route selection by other nodes when the node is quiescing.

This object corresponds to cv4580, byte 7, bit 5."

::= { appnNnTopologyFREntry 9 }

appnNnNodeFRGateway OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the node provide gateway services.

This object corresponds to cv4580, byte 8, bit 0."

::= { appnNnTopologyFREntry 10 }

appnNnNodeFRCentralDirectory OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the node supports central directory services.

This object corresponds to cv4580, byte 8, bit 1."

::= { appnNnTopologyFREntry 11 }

appnNnNodeFRIsr OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the node supports intermediate session routing (ISR).

This object corresponds to cv4580, byte 8, bit 2."

::= { appnNnTopologyFREntry 12 }

appnNnNodeFRGarbageCollect OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the node has been marked for garbage collection (deletion from the topology database) upon the next garbage collection cycle.

This object corresponds to cv4580, byte 7, bit 3."

::= { appnNnTopologyFREntry 13 }

appnNnNodeFRHprSupport OBJECT-TYPE

SYNTAX INTEGER {

noHprSupport(1),

hprBaseOnly(2),

rtpTower(3),

controlFlowsOverRtpTower(4)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the node's level of support for high-performance routing (HPR):

noHprSupport(1)	- no HPR support
hprBaseOnly(2)	- HPR base (option set 1400) supported
rtpTower(3)	- HPR base and RTP tower (option set 1401) supported
controlFlowsOverRtpTower(4)	- HPR base, RTP tower, and control flows over RTP (option set 1402) supported

This object corresponds to cv4580, byte 9, bits 3-4."

```
::= { appnNnTopologyFREntry 14 }
```

appnNnNodeFRPeriBorderSup OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this node has peripheral border node support.

This object corresponds to cv4580, byte 9, bit 0."

```
::= { appnNnTopologyFREntry 15 }
```

appnNnNodeFRInterchangeSup OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this node has interchange node support.

This object corresponds to cv4580, byte 9, bit 1."

```
::= { appnNnTopologyFREntry 16 }
```

appnNnNodeFRExteBorderSup OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this node has extended border node support.

This object corresponds to cv4580, byte 9, bit 2."

```
::= { appnNnTopologyFREntry 17 }
```

appnNnNodeFRBranchAwareness OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this node supports branch awareness.

This object corresponds to cv4580, byte 8, bit 4."

```
::= { appnNnTopologyFREntry 18 }
```

--APPN transmission group (TG) table

-- This table describes the TGs associated with all the APPN network
-- nodes known to this node. The originating (owning) node for each
-- TG is repeated here to provide a means of correlating the TGs with
-- the nodes.

appnNnTgTopologyFRTable OBJECT-TYPE

SYNTAX SEQUENCE OF AppnNnTgTopologyFREntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Portion of the APPN topology database that describes all of
the APPN transmissions groups between nodes in the database."

```
::= { appnNnTopology 4 }
```

appnNnTgTopologyFREntry OBJECT-TYPE

SYNTAX AppnNnTgTopologyFREntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table is indexed by four columns: FRSN, TG owner fully
qualified node name, TG destination fully qualified node name,
and TG number."

INDEX

```
{ appnNnTgFRFrsn,  
  appnNnTgFROwner,  
  appnNnTgFRDest,  
  appnNnTgFRNum }
```

```
::= { appnNnTgTopologyFRTable 1 }
```

AppnNnTgTopologyFREntry ::= SEQUENCE {

appnNnTgFRFrsn	Unsigned32,
appnNnTgFROwner	SnaControlPointName,
appnNnTgFRDest	SnaControlPointName,
appnNnTgFRNum	INTEGER,
appnNnTgFREntryTimeLeft	AppnTopologyEntryTimeLeft,
appnNnTgFRDestVirtual	TruthValue,
appnNnTgFRDlcData	AppnTgDlcData,
appnNnTgFRRsn	Unsigned32,
appnNnTgFROperational	TruthValue,
appnNnTgFRQuiescing	TruthValue,
appnNnTgFRCpCpSession	INTEGER,
appnNnTgFREffCap	AppnTgEffectiveCapacity,
appnNnTgFRConnCost	INTEGER,
appnNnTgFRByteCost	INTEGER,
appnNnTgFRSecurity	AppnTgSecurity,
appnNnTgFRDelay	AppnTgDelay,
appnNnTgFRUsr1	INTEGER,
appnNnTgFRUsr2	INTEGER,
appnNnTgFRUsr3	INTEGER,
appnNnTgFRGarbageCollect	TruthValue,
appnNnTgFRSubareaNum	Unsigned32,
appnNnTgFRHprSup	TruthValue,
appnNnTgFRDestHprTrans	TruthValue,
appnNnTgFRTypeIndicator	INTEGER,
appnNnTgFRIntersubnet	TruthValue,
appnNnTgFRMltgLinkType	TruthValue,
appnNnTgFRBranchTg	TruthValue

}

appnNnTgFRFrsn OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Flow reduction sequence numbers (FRSNs) are associated with Topology Database Updates (TDUs) and are unique only within each APPN network node. A TDU can be associated with multiple APPN resources. This FRSN indicates the last time this resource was updated at this node."

::= { appnNnTgTopologyFREntry 1 }

appnNnTgFROwner OBJECT-TYPE
SYNTAX SnaControlPointName
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "Administratively assigned name for the originating node for
 this TG. This is the same name specified in the node table."

 ::= { appnNnTgTopologyFREntry 2 }

appnNnTgFRDest OBJECT-TYPE
SYNTAX SnaControlPointName
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "Administratively assigned fully qualified network name for the
 destination node for this TG."

 ::= { appnNnTgTopologyFREntry 3 }

appnNnTgFRNum OBJECT-TYPE
SYNTAX INTEGER (0..255)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "Number associated with this transmission group. Range is
 0-255."

 ::= { appnNnTgTopologyFREntry 4 }

appnNnTgFREntryTimeLeft OBJECT-TYPE
SYNTAX AppnTopologyEntryTimeLeft
UNITS "days"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Number of days before deletion of this network node TG entry
 if it is not operational or has an odd (inconsistent) RSN."

 ::= { appnNnTgTopologyFREntry 5 }

appnNnTgFRDestVirtual OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Indicates whether the destination node is a virtual routing
 node."

```
::= { appnNnTgTopologyFREntry 6 }
```

```
appnNnTgFRDlcData OBJECT-TYPE
```

```
SYNTAX AppnTgDlcData
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"DLC-specific data related to a link connection network."
```

```
::= { appnNnTgTopologyFREntry 7 }
```

```
appnNnTgFRRsn OBJECT-TYPE
```

```
SYNTAX Unsigned32
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Current owning node's resource sequence number for this
resource. An odd number indicates that information about the
resource is inconsistent."
```

```
This object corresponds to the numeric value in cv47, bytes
2-5"
```

```
::= { appnNnTgTopologyFREntry 8 }
```

```
appnNnTgFROperational OBJECT-TYPE
```

```
SYNTAX TruthValue
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Indicates whether the transmission group is operational."
```

```
This object corresponds to cv47, byte 6, bit 0."
```

```
::= { appnNnTgTopologyFREntry 9 }
```

```
appnNnTgFRQuiescing OBJECT-TYPE
```

```
SYNTAX TruthValue
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Indicates whether the transmission group is quiescing."
```

```
If the TG owner is either an extended border node or a
branch-aware network node (indicated, respectively, by
the appnNnNodeFRExteBorderSup and appnNnNodeFRBranchAwareness
objects in the corresponding appnNnTopologyFREntry), then
this indicator is artificially set to TRUE in the APPN
```

topology database, to remove the TG from other nodes' route calculations. A management application can determine whether the TG is actually quiescing by examining its appnLocalTgQuiescing object at the TG owner.

This object corresponds to cv47, byte 6, bit 2."

```
::= { appnNnTgTopologyFREntry 10 }
```

appnNnTgFRCpCpSession OBJECT-TYPE

```
SYNTAX INTEGER {
    supportedUnknownStatus(1),
    supportedActive(2),
    notSupported(3),
    supportedNotActive(4)
}
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether CP-CP sessions are supported on this TG, and whether the TG owner's contention-winner session is active on this TG. Some nodes in the network are not able to differentiate support and status of CP-CP sessions, and thus may report the 'supportedUnknownStatus' value.

This object corresponds to cv47, byte 6, bits 3-4."

```
::= { appnNnTgTopologyFREntry 11 }
```

appnNnTgFREffCap OBJECT-TYPE

```
SYNTAX AppnTgEffectiveCapacity
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Effective capacity for this TG."

```
::= { appnNnTgTopologyFREntry 12 }
```

appnNnTgFRConnCost OBJECT-TYPE

```
SYNTAX INTEGER (0..255)
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Cost per connect time.

This is an administratively assigned value representing the relative cost per unit of time to use this TG. Range is from

0, which means no cost, to 255, which indicates maximum cost.

This object corresponds to cv47, byte 13."

::= { appnNnTgTopologyFREntry 13 }

appnNnTgFRByteCost OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Cost per byte transmitted.

This is an administratively assigned value representing the relative cost of transmitting a byte over this TG. Range is from 0, which means no cost, to 255, which indicates maximum cost.

This object corresponds to cv47, byte 14."

::= { appnNnTgTopologyFREntry 14 }

appnNnTgFRSecurity OBJECT-TYPE

SYNTAX AppnTgSecurity

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Administratively assigned security level of this TG.

This object corresponds to cv47, byte 16."

::= { appnNnTgTopologyFREntry 15 }

appnNnTgFRDelay OBJECT-TYPE

SYNTAX AppnTgDelay

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Administratively assigned delay associated with this TG.

This object corresponds to cv47, byte 17."

::= { appnNnTgTopologyFREntry 16 }

appnNnTgFRUsr1 OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"First user-defined TG characteristic for this TG. This is an administratively assigned value associated with the TG.

This object corresponds to cv47, byte 19."

::= { appnNnTgTopologyFREntry 17 }

appnNnTgFRUsr2 OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Second user-defined TG characteristic for this TG. This is an administratively assigned value associated with the TG.

This object corresponds to cv47, byte 20."

::= { appnNnTgTopologyFREntry 18 }

appnNnTgFRUsr3 OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Third user-defined TG characteristic for this TG. This is an administratively assigned value associated with the TG.

This object corresponds to cv47, byte 21."

::= { appnNnTgTopologyFREntry 19 }

appnNnTgFRGarbageCollect OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the TG has been marked for garbage collection (deletion from the topology database) upon the next garbage collection cycle.

This object corresponds to cv47, byte 6, bit 1."

::= { appnNnTgTopologyFREntry 20 }

appnNnTgFRSubareaNum OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The subarea number associated with this TG.

This object corresponds to cv4680, bytes m+2 through m+5."

::= { appnNnTgTopologyFREntry 21 }

appnNnTgFRHprSup OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether high performance routing (HPR) is supported over this TG.

This object corresponds to cv4680, byte m+1, bit 2."

::= { appnNnTgTopologyFREntry 22 }

appnNnTgFRDestHprTrans OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the destination node supports high performance routing (HPR) transport tower.

This object corresponds to cv4680, byte m+1, bit 7."

::= { appnNnTgTopologyFREntry 23 }

appnNnTgFRTypeIndicator OBJECT-TYPE

SYNTAX INTEGER {
 unknown(1),
 appnOrBfTg(2),
 interchangeTg(3),
 virtualRouteTg(4)
}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the type of the TG.

This object corresponds to cv4680, byte m+1, bits 3-4."

::= { appnNnTgTopologyFREntry 24 }

appnNnTgFRIntersubnet OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the transmission group is an intersubnet TG, which defines a border between subnetworks.

This object corresponds to cv4680, byte m+1, bit 5."

```
::= { appnNnTgTopologyFREntry 25 }
```

appnNnTgFRmltgLinkType OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates whether the transmission group is a multi-link TG. A TG that has been brought up as a multi-link TG is reported as one, even if it currently has only one link active.

This object corresponds to cv47, byte 6, bit 5."

```
::= { appnNnTgTopologyFREntry 26 }
```

appnNnTgFRBranchTg OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether the transmission group is a branch TG (equivalently, whether the destination of the transmission group is a branch network node).

This object corresponds to cv4680, byte m+1, bit 1."

```
::= { appnNnTgTopologyFREntry 27 }
```

```
-- ***** The APPN Local Topology Group *****
-- This MIB Group represents the local topology maintained in
-- APPN network nodes, end nodes, and branch network nodes. It consists
-- of two tables:
--   - a table containing information about all of the TGs owned
--     by this node, which is implemented by all node types.
--   - a table containing all of the information known to this node
--     about the TGs owned by its end nodes, which is implemented only
--     by network nodes.
```

```
appnLocalTopology      OBJECT IDENTIFIER ::= { appnObjects 3 }
```

```
-- APPN Local Transmission Group (TG) table
-- This table describes the TGs associated with this node only.
```

```
appnLocalTgTable OBJECT-TYPE
```

```
    SYNTAX SEQUENCE OF AppnLocalTgEntry
```

```
    MAX-ACCESS not-accessible
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "TG Table describes all of the TGs owned by this node.  The TG
        destination can be a virtual node, network node, LEN node, or
        end node."
```

```
    ::= { appnLocalTopology 1 }
```

```
appnLocalTgEntry OBJECT-TYPE
```

```
    SYNTAX AppnLocalTgEntry
```

```
    MAX-ACCESS not-accessible
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "This table is indexed by the destination CpName and the TG
        number."
```

```
    INDEX
```

```
        { appnLocalTgDest,
          appnLocalTgNum }
```

```
    ::= { appnLocalTgTable 1 }
```

```
AppnLocalTgEntry ::= SEQUENCE {
```

appnLocalTgDest	SnaControlPointName,
appnLocalTgNum	INTEGER,
appnLocalTgDestVirtual	TruthValue,
appnLocalTgDlcData	AppnTgDlcData,
appnLocalTgPortName	DisplayString,
appnLocalTgQuiescing	TruthValue,
appnLocalTgOperational	TruthValue,
appnLocalTgCpCpSession	INTEGER,
appnLocalTgEffCap	AppnTgEffectiveCapacity,
appnLocalTgConnCost	INTEGER,
appnLocalTgByteCost	INTEGER,
appnLocalTgSecurity	AppnTgSecurity,
appnLocalTgDelay	AppnTgDelay,
appnLocalTgUsr1	INTEGER,
appnLocalTgUsr2	INTEGER,


```
appnLocalTgUsr3          INTEGER,  
appnLocalTgHprSup        INTEGER,  
appnLocalTgIntersubnet    TruthValue,  
appnLocalTgMltgLinkType  TruthValue,  
appnLocalTgBranchLinkType INTEGER  
}
```

```
appnLocalTgDest OBJECT-TYPE  
    SYNTAX SnaControlPointName  
    MAX-ACCESS not-accessible  
    STATUS current  
    DESCRIPTION
```

```
        "Administratively assigned name of the destination node for  
        this TG.  This is the fully qualified name of a network node,  
        end node, LEN node, or virtual routing node."
```

```
 ::= { appnLocalTgEntry 1 }
```

```
appnLocalTgNum OBJECT-TYPE  
    SYNTAX INTEGER (0..255)  
    MAX-ACCESS not-accessible  
    STATUS current  
    DESCRIPTION
```

```
        "Number associated with this transmission group."
```

```
 ::= { appnLocalTgEntry 2 }
```

```
appnLocalTgDestVirtual OBJECT-TYPE  
    SYNTAX TruthValue  
    MAX-ACCESS read-only  
    STATUS current  
    DESCRIPTION
```

```
        "Indicates whether the destination node for this TG is a  
        virtual routing node."
```

```
 ::= { appnLocalTgEntry 3 }
```

```
appnLocalTgDlcData OBJECT-TYPE  
    SYNTAX AppnTgDlcData  
    MAX-ACCESS read-only  
    STATUS current  
    DESCRIPTION
```

```
        "DLC-specific data related to a link connection network."
```

```
 ::= { appnLocalTgEntry 4 }
```

```
appnLocalTgPortName OBJECT-TYPE  
    SYNTAX DisplayString (SIZE (0..10))
```

MAX-ACCESS read-only
STATUS current
DESCRIPTION

"Administratively assigned name for the local port associated with this TG. A zero-length string indicates that this value is unknown."

::= { appnLocalTgEntry 5 }

appnLocalTgQuiescing OBJECT-TYPE

SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"Indicates whether the transmission group is quiescing."

::= { appnLocalTgEntry 6 }

appnLocalTgOperational OBJECT-TYPE

SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"Indicates whether the transmission group is operational."

::= { appnLocalTgEntry 7 }

appnLocalTgCpCpSession OBJECT-TYPE

SYNTAX INTEGER {
 supportedUnknownStatus(1),
 supportedActive(2),
 notSupported(3),
 supportedNotActive(4)
}

MAX-ACCESS read-only
STATUS current
DESCRIPTION

"Indicates whether CP-CP sessions are supported on this TG, and whether the TG owner's contention-winner session is active on this TG. Some nodes in the network are not able to differentiate support and status of CP-CP sessions, and thus may report the 'supportedUnknownStatus' value."

::= { appnLocalTgEntry 8 }

appnLocalTgEffCap OBJECT-TYPE

SYNTAX AppnTgEffectiveCapacity
MAX-ACCESS read-only

STATUS current
DESCRIPTION
 "Effective capacity for this TG."

::= { appnLocalTgEntry 9 }

appnLocalTgConnCost OBJECT-TYPE
 SYNTAX INTEGER (0..255)
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Cost per connect time: a value representing the relative cost
 per unit of time to use the TG. Range is from 0, which means
 no cost, to 255."

::= { appnLocalTgEntry 10 }

appnLocalTgByteCost OBJECT-TYPE
 SYNTAX INTEGER (0..255)
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Relative cost of transmitting a byte over this link.
 Range is from 0 (lowest cost) to 255."

::= { appnLocalTgEntry 11 }

appnLocalTgSecurity OBJECT-TYPE
 SYNTAX AppnTgSecurity
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Administratively assigned security level of this TG."

::= { appnLocalTgEntry 12 }

appnLocalTgDelay OBJECT-TYPE
 SYNTAX AppnTgDelay
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Administratively assigned delay associated with this TG."
 ::= { appnLocalTgEntry 13 }

appnLocalTgUsr1 OBJECT-TYPE
 SYNTAX INTEGER (0..255)
 MAX-ACCESS read-only
 STATUS current

DESCRIPTION

"First user-defined TG characteristic for this TG. This is an administratively assigned value associated with the TG."

::= { appnLocalTgEntry 14 }

appnLocalTgUsr2 OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Second user-defined TG characteristic for this TG. This is an administratively assigned value associated with the TG."

::= { appnLocalTgEntry 15 }

appnLocalTgUsr3 OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Third user-defined TG characteristic for this TG. This is an administratively assigned value associated with the TG."

::= { appnLocalTgEntry 16 }

appnLocalTgHprSup OBJECT-TYPE

SYNTAX INTEGER {

noHprSupport(1),

hprBaseOnly(2),

rtpTower(3),

controlFlowsOverRtpTower(4)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the level of high performance routing (HPR) support over this TG :

noHprSupport(1)	- no HPR support
hprBaseOnly(2)	- HPR base (option set 1400) supported
rtpTower(3)	- HPR base and RTP tower (option set 1401) supported
controlFlowsOverRtpTower(4)	- HPR base, RTP tower, and control flows over RTP (option set 1402) supported"

```
::= { appnLocalTgEntry 17 }
```

```
appnLocalTgIntersubnet OBJECT-TYPE
```

```
SYNTAX TruthValue
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Indicates whether the transmission group is an intersubnet TG,
which defines a border between subnetworks."
```

```
::= { appnLocalTgEntry 18 }
```

```
appnLocalTgMltgLinkType OBJECT-TYPE
```

```
SYNTAX TruthValue
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"This object indicates whether the transmission group is a
multi-link TG. A TG that has been brought up as a multi-link
TG is reported as one, even if it currently has only one link
active."
```

```
::= { appnLocalTgEntry 19 }
```

```
appnLocalTgBranchLinkType OBJECT-TYPE
```

```
SYNTAX INTEGER {
```

```
    other(1),
```

```
    uplink(2),
```

```
    downlink(3),
```

```
    downlinkToBranchNetworkNode(4),
```

```
    none(5),
```

```
    unknown(255)
```

```
}
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Branch link type of this TG:
```

```
    other(1) = the agent has determined the TG's
              branch link type to be a value other
              than branch uplink or branch
              downlink. This is the value used
              for a connection network TG owned by
              a branch network node.
    uplink(2) = the TG is a branch uplink.
    downlink(3) = the TG is a branch downlink to an
                  end node.
    downlinkToBranchNetworkNode(4) = the TG is a branch
                                      downlink to a cascaded branch
```

	network node.
none(5)	= the TG is not a branch TG.
unknown(255)	= the agent cannot determine the branch link type of the TG."

```
::= { appnLocalTgEntry 20 }
```

```
-- APPN Local End Node Transmission Group (TG) table
-- This table describes the TGs associated with all of the end nodes
-- known to this node.
```

```
appnLocalEnTgTable OBJECT-TYPE
    SYNTAX SEQUENCE OF AppnLocalEnTgEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Table describing all of the TGs owned by the end nodes known
        to this node via TG registration. This node does not represent
        its own view of the TG on behalf of the partner node in this
        table. The TG destination can be a virtual routing node,
        network node, or end node."
```

```
::= { appnLocalTopology 2 }
```

```
appnLocalEnTgEntry OBJECT-TYPE
    SYNTAX AppnLocalEnTgEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table requires multiple indexes to uniquely identify each
        TG. They are originating CPname, destination CPname, and the
        TG number."
```

```
INDEX
    {appnLocalEnTgOrigin,
     appnLocalEnTgDest,
     appnLocalEnTgNum}
```

```
::= { appnLocalEnTgTable 1 }
```

```
AppnLocalEnTgEntry ::= SEQUENCE {
    appnLocalEnTgOrigin      SnaControlPointName,
    appnLocalEnTgDest        SnaControlPointName,
    appnLocalEnTgNum         INTEGER,
    appnLocalEnTgEntryTimeLeft AppnTopologyEntryTimeLeft,

    appnLocalEnTgDestVirtual TruthValue,
```

appnLocalEnTgDlcData	AppnTgDlcData,
appnLocalEnTgOperational	TruthValue,
appnLocalEnTgCpCpSession	INTEGER,
appnLocalEnTgEffCap	AppnTgEffectiveCapacity,
appnLocalEnTgConnCost	INTEGER,
appnLocalEnTgByteCost	INTEGER,
appnLocalEnTgSecurity	AppnTgSecurity,
appnLocalEnTgDelay	AppnTgDelay,
appnLocalEnTgUsr1	INTEGER,
appnLocalEnTgUsr2	INTEGER,
appnLocalEnTgUsr3	INTEGER,
appnLocalEnTgMltgLinkType	TruthValue
	}

appnLocalEnTgOrigin OBJECT-TYPE
 SYNTAX SnaControlPointName
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"Administratively assigned name of the origin node for this TG. This is a fully qualified network name."

::= { appnLocalEnTgEntry 1 }

appnLocalEnTgDest OBJECT-TYPE
 SYNTAX SnaControlPointName
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"Administratively assigned name of the destination node for this TG. This is the fully qualified name of a network node, end node, LEN node, or virtual routing node."

::= { appnLocalEnTgEntry 2 }

appnLocalEnTgNum OBJECT-TYPE
 SYNTAX INTEGER (0..255)
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"Number associated with this transmission group."

::= { appnLocalEnTgEntry 3 }

appnLocalEnTgEntryTimeLeft OBJECT-TYPE
 SYNTAX AppnTopologyEntryTimeLeft
 UNITS "days"

MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Number of days before deletion of this end node TG entry."

::= { appnLocalEnTgEntry 4 }

appnLocalEnTgDestVirtual OBJECT-TYPE
 SYNTAX TruthValue
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Indicates whether the destination node is a virtual routing
 node."

::= { appnLocalEnTgEntry 5 }

appnLocalEnTgDlcData OBJECT-TYPE
 SYNTAX AppnTgDlcData
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "DLC-specific data related to a link connection network."

::= { appnLocalEnTgEntry 6 }

appnLocalEnTgOperational OBJECT-TYPE
 SYNTAX TruthValue
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Indicates whether the transmission group is operational."

::= { appnLocalEnTgEntry 7 }

appnLocalEnTgCpCpSession OBJECT-TYPE
 SYNTAX INTEGER {
 supportedUnknownStatus(1),
 supportedActive(2),
 notSupported(3),
 supportedNotActive(4)
 }
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Indicates whether CP-CP sessions are supported on this TG, and
 whether the TG owner's contention-winner session is active on
 this TG. Some nodes in the network are not able to

differentiate support and status of CP-CP sessions, and thus may report the 'supportedUnknownStatus' value."

::= { appnLocalEnTgEntry 8 }

appnLocalEnTgEffCap OBJECT-TYPE
SYNTAX AppnTgEffectiveCapacity
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Effective capacity for this TG."

::= { appnLocalEnTgEntry 9 }

appnLocalEnTgConnCost OBJECT-TYPE
SYNTAX INTEGER (0..255)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Cost per connect time: a value representing the relative cost per unit of time to use the TG. Range is from 0, which means no cost, to 255."

::= { appnLocalEnTgEntry 10 }

appnLocalEnTgByteCost OBJECT-TYPE
SYNTAX INTEGER (0..255)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Relative cost of transmitting a byte over this link. Range is from 0, which means no cost, to 255."

::= { appnLocalEnTgEntry 11 }

appnLocalEnTgSecurity OBJECT-TYPE
SYNTAX AppnTgSecurity
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Administratively assigned security level of this TG."

::= { appnLocalEnTgEntry 12 }

appnLocalEnTgDelay OBJECT-TYPE
SYNTAX AppnTgDelay
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"Administratively assigned delay associated with this TG."

::= { appnLocalEnTgEntry 13 }

appnLocalEnTgUsr1 OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"First user-defined TG characteristic for this TG. This is an administratively assigned value associated with the TG."

::= { appnLocalEnTgEntry 14 }

appnLocalEnTgUsr2 OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Second user-defined TG characteristic for this TG. This is an administratively assigned value associated with the TG."

::= { appnLocalEnTgEntry 15 }

appnLocalEnTgUsr3 OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Third user-defined TG characteristic for this TG. This is an administratively assigned value associated with the TG."

::= { appnLocalEnTgEntry 16 }

appnLocalEnTgMltgLinkType OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates whether the transmission group is a multi-link TG. A TG that has been brought up as a multi-link TG is reported as one, even if it currently has only one link active."

::= { appnLocalEnTgEntry 17 }

-- ***** The APPN Directory Group *****

```
appnDir          OBJECT IDENTIFIER ::= { appnObjects 4 }
appnDirPerf      OBJECT IDENTIFIER ::= { appnDir 1 }
```

```
-- The APPN Directory Group
```

```
-- The APPN Directory Database
```

```
-- Each APPN network node and branch network node maintains directories
-- containing information on which LUs (applications) are available and
-- where they are located.  LUs can be located in an APPN network node,
-- in any of its attached end nodes or branch network nodes, or in any
-- of the nodes below one of its attached branch network nodes.
```

```
appnDirMaxCaches OBJECT-TYPE
```

```
    SYNTAX Unsigned32
```

```
    UNITS "directory entries"
```

```
    MAX-ACCESS read-only
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "Maximum number of cache entries allowed.  This is an
        administratively assigned value."
```

```
    ::= { appnDirPerf 1 }
```

```
appnDirCurCaches OBJECT-TYPE
```

```
    SYNTAX Gauge32
```

```
    UNITS "directory entries"
```

```
    MAX-ACCESS read-only
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "Current number of cache entries."
```

```
    ::= { appnDirPerf 2 }
```

```
appnDirCurHomeEntries OBJECT-TYPE
```

```
    SYNTAX Gauge32
```

```
    UNITS "directory entries"
```

```
    MAX-ACCESS read-only
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "Current number of home entries."
```

```
    ::= { appnDirPerf 3 }
```

```
appnDirRegEntries OBJECT-TYPE
```

```
    SYNTAX Gauge32
```

```
    UNITS "directory entries"
```

```
    MAX-ACCESS read-only
```

STATUS current
DESCRIPTION
 "Current number of registered entries."

::= { appnDirPerf 4 }

appnDirInLocates OBJECT-TYPE
 SYNTAX AppnNodeCounter
 UNITS "Locate messages"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Number of directed Locates received since the node was last
 reinitialized."

::= { appnDirPerf 5 }

appnDirInBcastLocates OBJECT-TYPE
 SYNTAX AppnNodeCounter
 UNITS "Locate messages"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Number of broadcast Locates received since the node was last
 reinitialized."

::= { appnDirPerf 6 }

appnDirOutLocates OBJECT-TYPE
 SYNTAX AppnNodeCounter
 UNITS "Locate messages"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Number of directed Locates sent since the node was last
 reinitialized."

::= { appnDirPerf 7 }

appnDirOutBcastLocates OBJECT-TYPE
 SYNTAX AppnNodeCounter
 UNITS "Locate messages"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Number of broadcast Locates sent since the node was last
 reinitialized."

```
::= { appnDirPerf 8 }
```

appnDirNotFoundLocates OBJECT-TYPE

SYNTAX AppnNodeCounter

UNITS "Locate messages"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of directed Locates returned with a 'not found' since the node was last reinitialized."

```
::= { appnDirPerf 9 }
```

appnDirNotFoundBcastLocates OBJECT-TYPE

SYNTAX AppnNodeCounter

UNITS "Locate messages"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of broadcast Locates returned with a 'not found' since the node was last reinitialized."

```
::= { appnDirPerf 10 }
```

appnDirLocateOutstands OBJECT-TYPE

SYNTAX Gauge32

UNITS "Locate messages"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Current number of outstanding Locates, both directed and broadcast. This value varies. A value of zero indicates that no Locates are unanswered."

```
::= { appnDirPerf 11 }
```

--APPN Directory table

-- This table contains information about all known LUs.

appnDirTable OBJECT-TYPE

SYNTAX SEQUENCE OF AppnDirEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Table containing information about all known LUs."

```
::= { appnDir 2 }
```

```
appnDirEntry OBJECT-TYPE
```

```
SYNTAX AppnDirEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"This table is indexed by the LU name."
```

```
INDEX
```

```
{appnDirLuName}
```

```
::= { appnDirTable 1 }
```

```
AppnDirEntry ::= SEQUENCE {
```

```
    appnDirLuName                               DisplayString,
```

```
    appnDirNnServerName                         SnaControlPointName,
```

```
    appnDirLuOwnerName                         SnaControlPointName,
```

```
    appnDirLuLocation                          INTEGER,
```

```
    appnDirType                                INTEGER,
```

```
    appnDirApparentLuOwnerName                 DisplayString
```

```
}
```

```
appnDirLuName OBJECT-TYPE
```

```
SYNTAX DisplayString (SIZE (1..17))
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Fully qualified network LU name in the domain of the
serving network node.  Entries take one of three forms:
```

- Explicit entries do not contain the character '*'.
- Partial wildcard entries have the form 'ccc*', where 'ccc' represents one to sixteen characters in a legal SNA LuName.
- A full wildcard entry consists of the single character '*'

```
::= { appnDirEntry 1 }
```

```
appnDirNnServerName OBJECT-TYPE
```

```
SYNTAX SnaControlPointName
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Fully qualified control point (CP) name of the network node
server.  For unassociated end node entries, a zero-length
string is returned."
```

```
::= { appnDirEntry 2 }
```

```
appnDirLuOwnerName OBJECT-TYPE
    SYNTAX SnaControlPointName
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
```

```
    "Fully qualified CP name of the node at which the LU is
    located. This name is the same as the serving NN name when
    the LU is located at a network node. It is also the same as
    the fully qualified LU name when this is the control point
    LU for this node."
```

```
::= { appnDirEntry 3 }
```

```
appnDirLuLocation OBJECT-TYPE
    SYNTAX INTEGER {
        local(1),          --Local
        domain(2),         --Domain
        xdomain(3)         --Cross Domain
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
```

```
    "Specifies the location of the LU with respect to the local
    node."
```

```
::= { appnDirEntry 4 }
```

```
appnDirType OBJECT-TYPE
    SYNTAX INTEGER {
        home(1),           --defined as home entry
        cache(2),          --learned over time
        registered(3)      --registered by end node
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
```

```
    "Directory types are:
```

```
    1 - Home
```

```
        The LU is in the domain of the local node, and the LU
        information has been configured at the local node.
```

```
    2 - Cache
```

```
        The LU has previously been located by a broadcast
        search, and the location information has been saved.
```

3 - Registered

The LU is at an end node that is in the domain of the local network node. Registered entries are registered by the served end node."

::= { appnDirEntry 5 }

appnDirApparentLuOwnerName OBJECT-TYPE

SYNTAX DisplayString (SIZE (0 | 3..17))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Fully qualified CP name of the node at which the LU appears to be located. This object and the appnDirLuOwnerName object are related as follows:

Implementations that support this object save in their directory database information about an LU's owning control point that was communicated in two control vectors:

- an Associated Resource Entry (X'3C') CV with resource type X'00F4' (ENCP)
- a Real Owning Control Point (X'4A') CV.

The X'4A' CV is created by a branch network node to preserve the name of the real owning control point for an LU below the branch network node, before it overwrites this name with its own name in the X'3C' CV. The X'4A' CV is not present for LUs that are not below branch network nodes.

If the information a node has about an LU's owning CP came only in a X'3C' CV, then the name from the X'3C' is returned in the appnDirLuOwnerName object, and a null string is returned in this object.

If the information a node has about an LU's owning CP came in both X'3C' and X'4A' CVs, then the name from the X'4A' is returned in the appnDirLuOwnerName object, and the name from the X'3C' (which will be the branch network node's name) is returned in this object."

::= { appnDirEntry 6 }

-- ***** The APPN Class of Service Group *****

appnCos OBJECT IDENTIFIER ::= { appnObjects 5 }


```
-- The APPN Class of Service (COS)

-- Class of Service is a means of expressing the quality of routes and
-- the transmission priority of traffic that flows on these routes.
-- The quality of routes is specified by two tables, a COS weight table
-- for TGs and a COS weight table for nodes. Values in these COS tables
-- are administratively assigned at each APPN node, with seven default
-- tables specified by the APPN architecture.
-- *****
```

appnCosModeTable OBJECT-TYPE

SYNTAX SEQUENCE OF AppnCosModeEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Table representing all of the defined mode names for this node. The table contains the matching COS name for each mode name."

```
::= { appnCos 1 }
```

appnCosModeEntry OBJECT-TYPE

SYNTAX AppnCosModeEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table is indexed by the mode name."

INDEX

```
{ appnCosModeName }
```

```
::= { appnCosModeTable 1 }
```

AppnCosModeEntry ::= SEQUENCE {

```
  appnCosModeName      SnaModeName,
```

```
  appnCosModeCosName   SnaClassOfServiceName
```

```
}
```

appnCosModeName OBJECT-TYPE

SYNTAX SnaModeName

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Administratively assigned name for this mode."

```
::= { appnCosModeEntry 1 }
```

appnCosModeCosName OBJECT-TYPE

SYNTAX SnaClassOfServiceName

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Administratively assigned name for this class of service."

::= { appnCosModeEntry 2 }

-- *****

appnCosNameTable OBJECT-TYPE

SYNTAX SEQUENCE OF AppnCosNameEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Table mapping all of the defined class-of-service names for this node to their network transmission priorities."

::= { appnCos 2 }

appnCosNameEntry OBJECT-TYPE

SYNTAX AppnCosNameEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The COS name is the index to this table."

INDEX

{appnCosName}

::= { appnCosNameTable 1 }

AppnCosNameEntry ::= SEQUENCE {

appnCosName SnaClassOfServiceName,

appnCosTransPriority INTEGER

}

appnCosName OBJECT-TYPE

SYNTAX SnaClassOfServiceName

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Administratively assigned name for this class of service."

::= { appnCosNameEntry 1 }

appnCosTransPriority OBJECT-TYPE

```

SYNTAX INTEGER {
    low(1),                --X'01'
    medium(2),             --X'02'
    high(3),               --X'03'
    network(4)             --X'04'
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "Transmission priority for this class of service:

        low(1)      - (X'01'):  low priority
        medium(2)   - (X'02'):  medium priority
        high(3)     - (X'03'):  high priority
        network(4)  - (X'04'):  network priority"

 ::= { appnCosNameEntry 2 }

-- *****
appnCosNodeRowTable OBJECT-TYPE
    SYNTAX SEQUENCE OF AppnCosNodeRowEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table contains all node-row information for all classes
        of service defined in this node."

    ::= { appnCos 3 }

appnCosNodeRowEntry OBJECT-TYPE
    SYNTAX AppnCosNodeRowEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A node entry for a given class of service."

    INDEX
        { appnCosNodeRowName,
          appnCosNodeRowIndex }

    ::= { appnCosNodeRowTable 1 }

AppnCosNodeRowEntry ::= SEQUENCE {
    appnCosNodeRowName          SnaClassOfServiceName,
    appnCosNodeRowIndex         INTEGER,
    appnCosNodeRowWgt           DisplayString,
    appnCosNodeRowResistMin     INTEGER,

```

```

appnCcosNodeRowResistMax      INTEGER,
appnCcosNodeRowMinCongestAllow  INTEGER,
appnCcosNodeRowMaxCongestAllow  INTEGER
    }

```

appnCcosNodeRowName OBJECT-TYPE

SYNTAX SnaClassOfServiceName

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Administratively assigned name for this class of service."

::= { appnCcosNodeRowEntry 1 }

appnCcosNodeRowIndex OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Subindex under appnCcosNodeRowName, corresponding to a row in the node table for the class of service identified in appnCcosNodeRowName."

For each class of service, this subindex orders rows in the appnCcosNodeRowTable in the same order as that used for route calculation in the APPN node."

::= { appnCcosNodeRowEntry 2 }

appnCcosNodeRowWgt OBJECT-TYPE

SYNTAX DisplayString (SIZE (1..64))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Weight to be associated with the nodes that fit the criteria specified by this node row."

This value can either be a character representation of an integer, or a formula for calculating the weight."

::= { appnCcosNodeRowEntry 3 }

appnCcosNodeRowResistMin OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Minimum route addition resistance value for this node."

Range of values is 0-255. The lower the value, the more desirable the node is for intermediate routing."

::= { appnCosNodeRowEntry 4 }

appnCosNodeRowResistMax OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Maximum route addition resistance value for this node. Range of values is 0-255. The lower the value, the more desirable the node is for intermediate routing."

::= { appnCosNodeRowEntry 5 }

appnCosNodeRowMinCongestAllow OBJECT-TYPE

SYNTAX INTEGER (0..1)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether low congestion will be tolerated. This object and appnCosNodeRowMaxCongestAllow together delineate a range of acceptable congestion states for a node. For the ordered pair (minimum congestion allowed, maximum congestion allowed), the values are interpreted as follows:

- (0,0): only low congestion is acceptable
- (0,1): either low or high congestion is acceptable
- (1,1): only high congestion is acceptable.

Note that the combination (1,0) is not defined, since it would identify a range whose lower bound was high congestion and whose upper bound was low congestion."

::= { appnCosNodeRowEntry 6 }

appnCosNodeRowMaxCongestAllow OBJECT-TYPE

SYNTAX INTEGER (0..1)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether low congestion will be tolerated. This object and appnCosNodeRowMinCongestAllow together delineate a range of acceptable congestion states for a node. For the ordered pair (minimum congestion allowed, maximum congestion allowed), the values are interpreted as follows:

- (0,0): only low congestion is acceptable
- (0,1): either low or high congestion is acceptable
- (1,1): only high congestion is acceptable.

Note that the combination (1,0) is not defined, since it would identify a range whose lower bound was high congestion and whose upper bound was low congestion."

```
::= { appnCosNodeRowEntry 7 }
```

```
-- *****
appnCosTgRowTable OBJECT-TYPE
    SYNTAX SEQUENCE OF AppnCosTgRowEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Table containing all the TG-row information for all classes of
        service defined in this node."
```

```
::= { appnCos 4 }
```

```
appnCosTgRowEntry OBJECT-TYPE
    SYNTAX AppnCosTgRowEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A TG entry for a given class of service."
```

```
INDEX
    { appnCosTgRowName,
      appnCosTgRowIndex }
```

```
::= { appnCosTgRowTable 1 }
```

```
AppnCosTgRowEntry ::= SEQUENCE {
    appnCosTgRowName          SnaClassOfServiceName,
    appnCosTgRowIndex         INTEGER,
    appnCosTgRowWgt           DisplayString,
    appnCosTgRowEffCapMin     AppnTgEffectiveCapacity,
    appnCosTgRowEffCapMax     AppnTgEffectiveCapacity,
    appnCosTgRowConnCostMin   INTEGER,
    appnCosTgRowConnCostMax   INTEGER,
    appnCosTgRowByteCostMin   INTEGER,
    appnCosTgRowByteCostMax   INTEGER,
    appnCosTgRowSecurityMin   AppnTgSecurity,
    appnCosTgRowSecurityMax   AppnTgSecurity,
    appnCosTgRowDelayMin      AppnTgDelay,
```

appnCosTgRowDelayMax	AppnTgDelay,
appnCosTgRowUsr1Min	INTEGER,
appnCosTgRowUsr1Max	INTEGER,
appnCosTgRowUsr2Min	INTEGER,
appnCosTgRowUsr2Max	INTEGER,
appnCosTgRowUsr3Min	INTEGER,
appnCosTgRowUsr3Max	INTEGER
}	

appnCosTgRowName OBJECT-TYPE

SYNTAX SnaClassOfServiceName

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Administratively assigned name for this class of service."

::= { appnCosTgRowEntry 1 }

appnCosTgRowIndex OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Subindex under appnCosTgRowName, corresponding to a row in the TG table for the class of service identified in appnCosTgRowName.

For each class of service, this subindex orders rows in the appnCosTgRowTable in the same order as that used for route calculation in the APPN node."

::= { appnCosTgRowEntry 2 }

appnCosTgRowWgt OBJECT-TYPE

SYNTAX DisplayString (SIZE (1..64))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Weight to be associated with the TGs that fit the criteria specified by this TG row.

This value can either be a character representation of an integer, or a formula for calculating the weight."

::= { appnCosTgRowEntry 3 }

appnCosTgRowEffCapMin OBJECT-TYPE

SYNTAX AppnTgEffectiveCapacity

MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Minimum acceptable capacity for this class of service."

::= { appnCostTgRowEntry 4 }

appnCostTgRowEffCapMax OBJECT-TYPE
 SYNTAX AppnTgEffectiveCapacity
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Maximum acceptable capacity for this class of service."

::= { appnCostTgRowEntry 5 }

appnCostTgRowConnCostMin OBJECT-TYPE
 SYNTAX INTEGER (0..255)
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Minimum acceptable cost per connect time for this class of
 service.

 Cost per connect time: a value representing the relative
 cost per unit of time to use this TG. Range is from 0, which
 means no cost, to 255."

::= { appnCostTgRowEntry 6 }

appnCostTgRowConnCostMax OBJECT-TYPE
 SYNTAX INTEGER (0..255)
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Maximum acceptable cost per connect time for this class of
 service.

 Cost per connect time: a value representing the relative
 cost per unit of time to use this TG. Range is from 0, which
 means no cost, to 255."

::= { appnCostTgRowEntry 7 }

appnCostTgRowByteCostMin OBJECT-TYPE
 SYNTAX INTEGER (0..255)
 MAX-ACCESS read-only
 STATUS current

DESCRIPTION

"Minimum acceptable cost per byte transmitted for this class of service.

Cost per byte transmitted: a value representing the relative cost per unit of time to use this TG. Range is from 0, which means no cost, to 255."

::= { appnCostTgRowEntry 8 }

appnCostTgRowByteCostMax OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Maximum acceptable cost per byte transmitted for this class of service.

Cost per byte transmitted: a value representing the relative cost of transmitting a byte over this TG. Range is from 0, which means no cost, to 255."

::= { appnCostTgRowEntry 9 }

appnCostTgRowSecurityMin OBJECT-TYPE

SYNTAX AppnTgSecurity

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Minimum acceptable security for this class of service."

::= { appnCostTgRowEntry 10 }

appnCostTgRowSecurityMax OBJECT-TYPE

SYNTAX AppnTgSecurity

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Maximum acceptable security for this class of service."

::= { appnCostTgRowEntry 11 }

appnCostTgRowDelayMin OBJECT-TYPE

SYNTAX AppnTgDelay

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Minimum acceptable propagation delay for this class of

service."

::= { appnCostTgRowEntry 12 }

appnCostTgRowDelayMax OBJECT-TYPE

SYNTAX AppnTgDelay

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Maximum acceptable propagation delay for this class of service."

::= { appnCostTgRowEntry 13 }

appnCostTgRowUsrlMin OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Minimum acceptable value for this user-defined characteristic."

::= { appnCostTgRowEntry 14 }

appnCostTgRowUsrlMax OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Maximum acceptable value for this user-defined characteristic."

::= { appnCostTgRowEntry 15 }

appnCostTgRowUsr2Min OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Minimum acceptable value for this user-defined characteristic."

::= { appnCostTgRowEntry 16 }

appnCostTgRowUsr2Max OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Maximum acceptable value for this user-defined characteristic."

::= { appnCostTgRowEntry 17 }

appnCostTgRowUshr3Min OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Minimum acceptable value for this user-defined characteristic."

::= { appnCostTgRowEntry 18 }

appnCostTgRowUshr3Max OBJECT-TYPE

SYNTAX INTEGER (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Maximum acceptable value for this user-defined characteristic."

::= { appnCostTgRowEntry 19 }

-- *****

-- Intermediate Session Information

-- *****

appnSessIntermediate OBJECT IDENTIFIER ::= { appnObjects 6 }

-- *****

-- Intermediate Session Information Global Objects

-- *****

-- The following simple objects allow the collection of intermediate session information to be started and stopped.

-- *****

appnIsInGlobal OBJECT IDENTIFIER ::= { appnSessIntermediate 1 }

appnIsInGlobeCtrAdminStatus OBJECT-TYPE

SYNTAX INTEGER {
 notActive(1),
 active(2),
 ready(3)
 }

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Object by which a Management Station can deactivate or activate capture of intermediate-session counts and names, by setting the value to notActive(1) or active(2), respectively. The value ready(3) is returned on GET operations until a SET has been processed; after that the value received on the most recent SET is returned.

The counts referred to here are the eight objects in the AppnIsInTable, from appnIsInP2SFmdPius through appnIsInS2PNonFmdBytes. The names are the four objects in this table, from appnIsInPriLuName through appnIsInCosName.

Setting this object to the following values has the following effects:

notActive(1)	stop collecting count data. If a count is queried, it returns the value 0. Collection of names may, but need not be, disabled.
active(2)	start collecting count data. If it is supported, collection of names is enabled."

::= { appnIsInGlobal 1 }

appnIsInGlobeCtrOperStatus OBJECT-TYPE

```
SYNTAX INTEGER {
    notActive(1),
    active(2)
}
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether or not the intermediate session counts are active. The counts referred to here are the eight objects in the AppnIsInTable, from appnIsInP2SFmdPius through appnIsInS2PNonFmdBytes. These eight counts are of type Unsigned32 rather than Counter32 because when this object enters the notActive state, either because a Management Station has set appnInInGlobeCtrAdminStatus to notActive or because of a locally-initiated transition, the counts are all reset to 0.

The values for this object are:

notActive(1):	collection of counts is not active; if it is queried, a count returns the value 0.
active(2):	collection of counts is active."

::= { appnIsInGlobal 2 }

appnIsInGlobeCtrStatusTime OBJECT-TYPE

SYNTAX TimeTicks

UNITS "hundredths of a second"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time since the appnIsInGlobeCtrOperStatus object last changed, measured in hundredths of a second. This time can be used to identify when this change occurred in relation to other events in the agent, such as the last time the APPN node was reinitialized."

::= { appnIsInGlobal 3 }

appnIsInGlobeRscv OBJECT-TYPE

SYNTAX INTEGER {
 notActive(1),
 active(2)
}

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Indicates the current route selection control vector (RSCV) collection option in effect, and allows a Management Station to change the option."

The values for this object are:

notActive(1): collection of route selection control vectors
 is not active.
active(2): collection of route selection control vectors
 is active."

::= { appnIsInGlobal 4 }

appnIsInGlobeRscvTime OBJECT-TYPE

SYNTAX TimeTicks

UNITS "hundredths of a second"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The time since the appnIsInGlobeRscv object last changed, measured in hundredths of a second. This time can be used to identify when this change occurred in relation to other events in the agent, such as the last time the APPN node was reinitialized."

```
::= { appnIsInGlobal 5 }
```

```
appnIsInGlobeActSess OBJECT-TYPE
```

```
    SYNTAX Gauge32
```

```
    UNITS "sessions"
```

```
    MAX-ACCESS read-only
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "The number of currently active intermediate sessions."
```

```
::= { appnIsInGlobal 6 }
```

```
appnIsInGlobeHprBfActSess OBJECT-TYPE
```

```
    SYNTAX Gauge32
```

```
    UNITS "sessions"
```

```
    MAX-ACCESS read-only
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "The number of currently active HPR intermediate sessions."
```

```
::= { appnIsInGlobal 7 }
```

```
-- *****
-- Intermediate Session Information Table
-- *****
-- This table contains information on intermediate sessions
-- which are currently active.
-- *****
```

```
appnIsInTable OBJECT-TYPE
```

```
    SYNTAX SEQUENCE OF AppnIsInEntry
```

```
    MAX-ACCESS not-accessible
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "Intermediate Session Information Table"
```

```
::= { appnSessIntermediate 2 }
```

```
appnIsInEntry OBJECT-TYPE
```

```
    SYNTAX AppnIsInEntry
```

```
    MAX-ACCESS not-accessible
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "Entry of Intermediate Session Information Table."
```

```
    INDEX
```

```
        { appnIsInFqCpName,
          appnIsInPcid }
```

```
::= { appnIsInTable 1 }
```

```
AppnIsInEntry ::= SEQUENCE {
    appnIsInFqCpName      SnaControlPointName,
    appnIsInPcid          OCTET STRING,

    appnIsInSessState     INTEGER,
    appnIsInPriLuName     DisplayString,
    appnIsInSecLuName     DisplayString,
    appnIsInModeName     SnaModeName,
    appnIsInCosName       SnaClassOfServiceName,
    appnIsInTransPriority  INTEGER,

    appnIsInSessType      INTEGER,
    appnIsInSessUpTime    TimeTicks,
    appnIsInCtrUpTime     TimeTicks,

    appnIsInP2SFmdPius    Unsigned32,
    appnIsInS2PFmdPius    Unsigned32,
    appnIsInP2SNonFmdPius Unsigned32,
    appnIsInS2PNonFmdPius Unsigned32,
    appnIsInP2SFmdBytes   Unsigned32,
    appnIsInS2PFmdBytes   Unsigned32,
    appnIsInP2SNonFmdBytes Unsigned32,
    appnIsInS2PNonFmdBytes Unsigned32,

    appnIsInPsAdjCpName   SnaControlPointName,
    appnIsInPsAdjTgNum     INTEGER,
    appnIsInPsSendMaxBtuSize INTEGER,
    appnIsInPsSendPacingType INTEGER,
    appnIsInPsSendRpc      Gauge32,
    appnIsInPsSendNxWndwSize Gauge32,
    appnIsInPsRecvPacingType INTEGER,
    appnIsInPsRecvRpc      Gauge32,
    appnIsInPsRecvNxWndwSize Gauge32,
    appnIsInSsAdjCpName    SnaControlPointName,
    appnIsInSsAdjTgNum     INTEGER,
    appnIsInSsSendMaxBtuSize INTEGER,
    appnIsInSsSendPacingType INTEGER,
    appnIsInSsSendRpc      Gauge32,
    appnIsInSsSendNxWndwSize Gauge32,
    appnIsInSsRecvPacingType INTEGER,
    appnIsInSsRecvRpc      Gauge32,
    appnIsInSsRecvNxWndwSize Gauge32,

    appnIsInRouteInfo     OCTET STRING,

    appnIsInRtpNceId      OCTET STRING,
```

```

appnIsInRtpTcid          OCTET STRING
    }

```

appnIsInFqCpName OBJECT-TYPE

SYNTAX SnaControlPointName

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The network-qualified control point name of the node at which the session and PCID originated. For APPN and LEN nodes, this is either CP name of the APPN node at which the origin LU is located or the CP name of the NN serving the LEN node at which the origin LU is located. For resources served by a dependent LU requester (DLUR), it is the name of the owning system services control point (SSCP)."

```
 ::= { appnIsInEntry 1 }
```

appnIsInPcid OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (8))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The procedure correlation identifier (PCID) of a session. It is an 8-byte value assigned by the primary LU."

```
 ::= { appnIsInEntry 2 }
```

appnIsInSessState OBJECT-TYPE

```

SYNTAX INTEGER {
    inactive(1),
    pendactive(2),
    active(3),
    pendinact(4)
}

```

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Indicates the state of the session:

```

    inactive(1) - session is inactive
    pendactive(2) - session is pending active
    active(3) - session is active
    pendinact(4) - session is pending inactive

```

Active sessions can be deactivated by setting this object to inactive(1)."


```
::= { appnIsInEntry 3 }
```

appnIsInPriLuName OBJECT-TYPE

SYNTAX DisplayString (SIZE (0..17))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The primary LU name of the session. A zero-length string indicates that this name is not available."

```
::= { appnIsInEntry 4 }
```

appnIsInSecLuName OBJECT-TYPE

SYNTAX DisplayString (SIZE (0..17))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The secondary LU name of the session. A zero-length string indicates that this name is not available."

```
::= { appnIsInEntry 5 }
```

appnIsInModeName OBJECT-TYPE

SYNTAX SnaModeName

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The mode name used for this session."

```
::= { appnIsInEntry 6 }
```

appnIsInCosName OBJECT-TYPE

SYNTAX SnaClassOfServiceName

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Class of Service (COS) name used for this session."

```
::= { appnIsInEntry 7 }
```

appnIsInTransPriority OBJECT-TYPE

```
SYNTAX INTEGER {  
    low(1),           --X'01'  
    medium(2),        --X'02'  
    high(3),          --X'03'  
    network(4)        --X'04'  
}
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Transmission priority for this class of service. Values are:

low(1) - (X'01'): low priority
 medium(2) - (X'02'): medium priority
 high(3) - (X'03'): high priority
 network(4) - (X'04'): network priority"

::= { appnIsInEntry 8 }

appnIsInSessType OBJECT-TYPE

SYNTAX INTEGER {
 unknown(1),
 lu62(2),
 lu0thru3(3),
 lu62dlur(4),
 lu0thru3dlur(5)
 }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The type of intermediate session. Defined values are

unknown The session type is not known.

lu62 A session between LUs of type 6.2
 (as indicated by the LU type in Bind)

lu0thru3 A session between LUs of type 0, 1, 2, or 3
 (as indicated by the LU type in Bind)

lu62dlur A session between LUs of type 6.2
 (as indicated by the LU type in Bind).
 One of the LUs is a dependent LU supported
 by the dependent LU requester (DLUR)
 function at this node.

lu0thru3dlur A session between LUs of type 0, 1, 2, or 3
 (as indicated by the LU type in Bind)
 One of the LUs is a dependent LU supported
 by the dependent LU requester (DLUR)
 function at this node."

::= { appnIsInEntry 9 }

appnIsInSessUpTime OBJECT-TYPE

SYNTAX TimeTicks

UNITS "hundredths of a second"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "Length of time the session has been active, measured in
 hundredths of a second."

::= { appnIsInEntry 10 }

appnIsInCtrUpTime OBJECT-TYPE
 SYNTAX TimeTicks
 UNITS "hundredths of a second"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Length of time the session counters have been active, measured
 in hundredths of a second."

::= { appnIsInEntry 11 }

appnIsInP2SFmdPius OBJECT-TYPE
 SYNTAX Unsigned32
 UNITS "path information units (PIUs)"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Number of function management data (FMD) path information
 units (PIUs) sent from the Primary LU to the Secondary LU since
 the counts were last activated."

::= { appnIsInEntry 12 }

appnIsInS2PFmdPius OBJECT-TYPE
 SYNTAX Unsigned32
 UNITS "path information units (PIUs)"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Number of FMD PIUs sent from the Secondary LU to the Primary
 LU since the counts were last activated."

::= { appnIsInEntry 13 }

appnIsInP2SNonFmdPius OBJECT-TYPE
 SYNTAX Unsigned32
 UNITS "path information units (PIUs)"
 MAX-ACCESS read-only
 STATUS current

DESCRIPTION

"Number of non-FMD PIUs sent from the Primary LU to the Secondary LU since the counts were last activated."

::= { appnIsInEntry 14 }

appnIsInS2PNonFmdPius OBJECT-TYPE

SYNTAX Unsigned32

UNITS "path information units (PIUs)"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of non-FMD PIUs sent from the Secondary LU to the Primary LU since the counts were last activated."

::= { appnIsInEntry 15 }

appnIsInP2SFmdBytes OBJECT-TYPE

SYNTAX Unsigned32

UNITS "bytes"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of FMD bytes sent from the Primary LU to the Secondary LU since the counts were last activated."

::= { appnIsInEntry 16 }

appnIsInS2PFmdBytes OBJECT-TYPE

SYNTAX Unsigned32

UNITS "bytes"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of FMD bytes sent from the Secondary LU to the Primary LU since the counts were last activated."

::= { appnIsInEntry 17 }

appnIsInP2SNonFmdBytes OBJECT-TYPE

SYNTAX Unsigned32

UNITS "bytes"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of non-FMD bytes sent from the Primary LU to the Secondary LU since the counts were last activated."

::= { appnIsInEntry 18 }

appnIsInS2PNonFmdBytes OBJECT-TYPE

SYNTAX Unsigned32

UNITS "bytes"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Number of non-FMD bytes sent from the Secondary LU to the Primary LU since the counts were last activated."

::= { appnIsInEntry 19 }

appnIsInPsAdjCpName OBJECT-TYPE

SYNTAX SnaControlPointName

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The primary stage adjacent CP name of this session. If the session stage traverses an RTP connection, the CP name of the remote RTP endpoint is returned."

::= { appnIsInEntry 20 }

appnIsInPsAdjTgNum OBJECT-TYPE

SYNTAX INTEGER (0..300)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The primary stage adjacent transmission group (TG) number associated with this session. If the session stage traverses an RTP connection, the value 256 is returned.

Values between 257 and 300 are available for other possible TG 'stand-ins' that may be added to APPN in the future."

::= { appnIsInEntry 21 }

appnIsInPsSendMaxBtuSize OBJECT-TYPE

SYNTAX INTEGER (99..32767)

UNITS "bytes"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The primary stage maximum basic transmission unit (BTU) size for sending data."

::= { appnIsInEntry 22 }

```
appnIsInPsSendPacingType OBJECT-TYPE
    SYNTAX INTEGER {
        fixed(1),
        adaptive(2)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The primary stage type of pacing being used for sending data."

    ::= { appnIsInEntry 23 }

appnIsInPsSendRpc OBJECT-TYPE
    SYNTAX Gauge32
    UNITS "message units (MUs)"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The primary stage send residual pace count.  This represents
        the primary stage number of message units (MUs) that can still
        be sent in the current session window."

    ::= { appnIsInEntry 24 }

appnIsInPsSendNxWndwSize OBJECT-TYPE
    SYNTAX Gauge32
    UNITS "message units (MUs)"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The primary stage size of the next window which will be used
        to send data."

    ::= { appnIsInEntry 25 }

appnIsInPsRecvPacingType OBJECT-TYPE
    SYNTAX INTEGER {
        fixed(1),
        adaptive(2)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The primary stage type of pacing being used for receiving
        data."

    ::= { appnIsInEntry 26 }
```

appnIsInPsRecvRpc OBJECT-TYPE

SYNTAX Gauge32

UNITS "message units (MUs)"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The primary stage receive residual pace count. This represents the primary stage number of message units (MUs) that can still be received in the current session window."

::= { appnIsInEntry 27 }

appnIsInPsRecvNxWndwSize OBJECT-TYPE

SYNTAX Gauge32

UNITS "message units (MUs)"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The primary stage size of the next window which will be used to receive data."

::= { appnIsInEntry 28 }

appnIsInSsAdjCpName OBJECT-TYPE

SYNTAX SnaControlPointName

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The secondary stage adjacent CP name of this session. If the session stage traverses an RTP connection, the CP name of the remote RTP endpoint is returned."

::= { appnIsInEntry 29 }

appnIsInSsAdjTgNum OBJECT-TYPE

SYNTAX INTEGER (0..300)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The secondary stage adjacent transmission group (TG) number associated with this session. If the session stage traverses an RTP connection, the value 256 is returned."

Values between 257 and 300 are available for other possible TG 'stand-ins' that may be added to APPN in the future."

::= { appnIsInEntry 30 }

```
appnIsInSsSendMaxBtuSize OBJECT-TYPE
    SYNTAX INTEGER (99..32767)
    UNITS "bytes"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The secondary stage maximum basic transmission unit (BTU) size
        for sending data."

    ::= { appnIsInEntry 31 }

appnIsInSsSendPacingType OBJECT-TYPE
    SYNTAX INTEGER {
        fixed(1),
        adaptive(2)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The secondary stage type of pacing being used for sending
        data."

    ::= { appnIsInEntry 32 }

appnIsInSsSendRpc OBJECT-TYPE
    SYNTAX Gauge32
    UNITS "message units (MUs)"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The secondary stage send residual pace count.  This represents
        the secondary stage number of message units (MUs) that can
        still be sent in the current session window."

    ::= { appnIsInEntry 33 }

appnIsInSsSendNxWndwSize OBJECT-TYPE
    SYNTAX Gauge32
    UNITS "message units (MUs)"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The secondary stage size of the next window which will be used
        to send data."

    ::= { appnIsInEntry 34 }

appnIsInSsRecvPacingType OBJECT-TYPE
```



```
SYNTAX INTEGER {
    fixed(1),
    adaptive(2)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The secondary stage type of pacing being used for receiving
    data."
```

```
::= { appnIsInEntry 35 }
```

appnIsInSsRecvRpc OBJECT-TYPE

```
SYNTAX Gauge32
UNITS "message units (MUs)"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The secondary stage receive residual pace count.  This
    represents the secondary stage number of message units (MUs)
    that can still be received in the current session window."
```

```
::= { appnIsInEntry 36 }
```

appnIsInSsRecvNxWndwSize OBJECT-TYPE

```
SYNTAX Gauge32
UNITS "message units (MUs)"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The secondary stage size of the next window which will be used
    to receive data."
```

```
::= { appnIsInEntry 37 }
```

appnIsInRouteInfo OBJECT-TYPE

```
SYNTAX OCTET STRING (SIZE (0..255))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The route selection control vector (RSCV X'2B') used for this
    session.  It is present for APPN nodes; but is not present for
    LEN nodes.  The format of this vector is described in SNA
    Formats.  If no RSCV is available, a zero-length string is
    returned."
```

```
::= { appnIsInEntry 38 }
```

```

appnIsInRtpNceId OBJECT-TYPE
    SYNTAX OCTET STRING (SIZE (1..8))
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The HPR local Network Connection Endpoint of the session."

    ::= { appnIsInEntry 39 }

appnIsInRtpTcid OBJECT-TYPE
    SYNTAX OCTET STRING (SIZE (8))
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The RTP connection local TCID of the session."

    ::= { appnIsInEntry 40 }

-- *****
-- Intermediate Session RTP Table
-- *****
-- This table contains information on intermediate sessions that are
-- being transported on Rapid Transport Protocol (RTP) connections by
-- High Performance Routing (HPR).
-- *****
appnIsRtpTable OBJECT-TYPE
    SYNTAX SEQUENCE OF AppnIsRtpEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A table indicating how many ISR sessions are transported by
        each RTP connection."

    ::= { appnSessIntermediate 3 }

appnIsRtpEntry OBJECT-TYPE
    SYNTAX AppnIsRtpEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Entry of Intermediate Session RTP Table."

    INDEX
        { appnIsRtpNceId,
          appnIsRtpTcid }

    ::= { appnIsRtpTable 1 }

```

```

AppnIsRtpEntry ::= SEQUENCE {
    appnIsRtpNceId      OCTET STRING,
    appnIsRtpTcid       OCTET STRING,
    appnIsRtpSessions   Gauge32
}

appnIsRtpNceId OBJECT-TYPE
    SYNTAX OCTET STRING (SIZE (1..8))
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "The local Network Connection Endpoint of the RTP connection."

    ::= { appnIsRtpEntry 1 }

appnIsRtpTcid OBJECT-TYPE
    SYNTAX OCTET STRING (SIZE (8))
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "The local TCID of the RTP connection."

    ::= { appnIsRtpEntry 2 }

appnIsRtpSessions OBJECT-TYPE
    SYNTAX Gauge32
    UNITS "sessions"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of intermediate sessions using this RTP
        connection."

    ::= { appnIsRtpEntry 3 }

-- *****
appnTraps          OBJECT IDENTIFIER ::= { appnMIB 2 }
-- *****

alertTrap NOTIFICATION-TYPE
    OBJECTS { alertIdNumber, affectedObject }
    STATUS current
    DESCRIPTION
        "This trap carries a 32-bit SNA Management Services (SNA/MS)
        Alert ID Number, as specified in SNA/MS Formats."

    ::= { appnTraps 1 }

```

```

alertIdNumber OBJECT-TYPE
    SYNTAX OCTET STRING (SIZE (4))
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
        "A 32-bit SNA Management Services (SNA/MS) Alert ID Number, as
        specified in SNA/MS Formats."

    ::= { appnTraps 2 }

affectedObject OBJECT-TYPE
    SYNTAX VariablePointer
    MAX-ACCESS accessible-for-notify
    STATUS current
    DESCRIPTION
        "The MIB object associated with the Alert condition, if there
        is an object associated with it.  If no associated object can
        be identified, the value 0.0 is passed in the trap."

    ::= { appnTraps 3 }

-- *****
-- Conformance information
-- *****

appnConformance          OBJECT IDENTIFIER ::= { appnMIB 3 }

appnCompliances          OBJECT IDENTIFIER ::= { appnConformance 1 }
appnGroups               OBJECT IDENTIFIER ::= { appnConformance 2 }

-- Compliance statements

-- appnCompliance  MODULE-COMPLIANCE (deprecated:  moved to end of module)

appnCompliance2  MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "The compliance statement for the SNMPv2 entities that
        implement the APPN MIB.

        In the descriptions for the conditionally mandatory groups that
        follow, the branch network node is treated as a third node type,
        parallel to network node and end node.  This is not how branch
        network nodes are treated in the base APPN architecture, but it
        increases clarity here to do it."
    MODULE -- this module

--      Unconditionally mandatory groups

```

```
MANDATORY-GROUPS {
    appnGeneralConfGroup2,
    appnPortConfGroup,
    appnLinkConfGroup2,
    appnLocalTgConfGroup2,
    appnDirTableConfGroup2
}

--      Conditionally mandatory groups
GROUP   appnNnUniqueConfGroup
DESCRIPTION
    "The appnNnUniqueConfGroup is mandatory for
    network nodes."

GROUP   appnEnUniqueConfGroup
DESCRIPTION
    "The appnEnUniqueConfGroup is mandatory for end
    nodes."

GROUP   appnVrnConfGroup
DESCRIPTION
    "The appnVrnConfGroup is mandatory for network
    nodes, end nodes, and branch network nodes that
    implement virtual routing node support."

GROUP   appnNnTopoConfGroup2
DESCRIPTION
    "The appnNnTopoConfGroup2 is mandatory for
    network nodes."

GROUP   appnLocalEnTopoConfGroup2
DESCRIPTION
    "The appnLocalEnTopoConfGroup2 is mandatory for
    network nodes."

GROUP   appnLocalDirPerfConfGroup
DESCRIPTION
    "The appnLocalDirPerfConfGroup is mandatory for
    APPN network nodes, end nodes, and branch network
    nodes."

GROUP   appnCosConfGroup
DESCRIPTION
    "The appnCosConfGroup is mandatory for APPN
    network nodes, end nodes, and branch network
    nodes."

GROUP   appnIntSessConfGroup
```

DESCRIPTION

"The appnIntSessConfGroup is mandatory for network nodes and branch network nodes."

GROUP appnHprBaseConfGroup

DESCRIPTION

"The appnHprBaseConfGroup is mandatory for nodes that implement the HPR base (APPN option set 1400)."

GROUP appnHprRtpConfGroup

DESCRIPTION

"The appnHprRtpConfGroup is mandatory for nodes that implement the HPR RTP tower (APPN option set 1401)."

GROUP appnHprCtrlFlowsRtpConfGroup

DESCRIPTION

"The appnHprCtrlFlowsRtpConfGroup is mandatory for nodes that implement the HPR Control Flows over RTP tower (APPN option set 1402)."

GROUP appnHprBfConfGroup

DESCRIPTION

"The appnHprBfConfGroup is mandatory for nodes that implement the APPN/HPR boundary function."

GROUP appnTrapConfGroup

DESCRIPTION

"Traps are optional for all nodes."

GROUP appnTrapNotifGroup

DESCRIPTION

"Traps are optional for all nodes."

GROUP appnBrNnConfGroup

DESCRIPTION

"The appnBrNnConfGroup is mandatory for branch network nodes."

::= { appnCompliances 3 }

-- { appnCompliances 2 } is used by the APPN-TRAP-MIB

-- Units of conformance

appnGeneralConfGroup2 OBJECT-GROUP

OBJECTS {
 appnNodeCpName,
 appnNodeId,
 appnNodeType,
 appnNodeUpTime,

```

        appnNodeParallelTg,
        appnNodeAdaptiveBindPacing,
        appnNodeHprSupport,
        appnNodeCounterDisconTime,
        appnNodeLsCounterType,
        appnNodeBrNn
    }
STATUS    current
DESCRIPTION
    "A collection of objects providing the instrumentation of
    APPN general information and capabilities."
 ::= { appnGroups 26 }
    -- { appnGroups 21 - 25 } are used by the APPN-TRAP-MIB

appnPortConfGroup  OBJECT-GROUP
    OBJECTS {
        appnPortCommand,
        appnPortOperState,
        appnPortDlcType,
        appnPortPortType,
        appnPortSIMRIM,
        appnPortLsRole,
        appnPortNegotLs,
        appnPortDynamicLinkSupport,
        appnPortMaxRcvBtuSize,
        appnPortMaxIframeWindow,
        appnPortDefLsGoodXids,
        appnPortDefLsBadXids,
        appnPortDynLsGoodXids,
        appnPortDynLsBadXids,
        appnPortSpecific,
        appnPortDlcLocalAddr,
        appnPortCounterDisconTime
    }
STATUS    current
DESCRIPTION
    "A collection of objects providing the instrumentation of
    APPN port information."
 ::= { appnGroups 2 }

appnLinkConfGroup2  OBJECT-GROUP
    OBJECTS {
        appnLsCommand,
        appnLsOperState,
        appnLsPortName,
        appnLsDlcType,
        appnLsDynamic,

```

appnLsAdjCpName,
appnLsAdjNodeType,
appnLsTgNum,
appnLsLimResource,
appnLsActOnDemand,
appnLsMigration,
appnLsPartnerNodeId,
appnLsCpCpSessionSupport,
appnLsMaxSendBtuSize,
appnLsInXidBytes,
appnLsInMsgBytes,
appnLsInXidFrames,
appnLsInMsgFrames,
appnLsOutXidBytes,
appnLsOutMsgBytes,
appnLsOutXidFrames,
appnLsOutMsgFrames,
appnLsEchoRsps,
appnLsCurrentDelay,
appnLsMaxDelay,
appnLsMinDelay,
appnLsMaxDelayTime,
appnLsGoodXids,
appnLsBadXids,
appnLsSpecific,
appnLsActiveTime,
appnLsCurrentStateTime,
appnLsHprSup,
appnLsLocalAddr,
appnLsRemoteAddr,
appnLsRemoteLsName,
appnLsStatusTime,
appnLsStatusLsName,
appnLsStatusCpName,
appnLsStatusPartnerId,
appnLsStatusTgNum,
appnLsStatusGeneralSense,
appnLsStatusRetry,
appnLsStatusEndSense,
appnLsStatusXidLocalSense,
appnLsStatusXidRemoteSense,
appnLsStatusXidByteInError,
appnLsStatusXidBitInError,
appnLsStatusDlcType,
appnLsStatusLocalAddr,
appnLsStatusRemoteAddr,
appnLsCounterDisconTime,
appnLsMltgMember


```

    }
    STATUS current
    DESCRIPTION
        "A collection of objects providing the instrumentation of
        APPN link information."
    ::= { appnGroups 27 }

```

appnLocalTgConfGroup2 OBJECT-GROUP

```

    OBJECTS {
        appnLocalTgDestVirtual,
        appnLocalTgDlcData,
        appnLocalTgPortName,
        appnLocalTgQuiescing,
        appnLocalTgOperational,
        appnLocalTgCpCpSession,
        appnLocalTgEffCap,
        appnLocalTgConnCost,
        appnLocalTgByteCost,
        appnLocalTgSecurity,
        appnLocalTgDelay,
        appnLocalTgUsr1,
        appnLocalTgUsr2,
        appnLocalTgUsr3,
        appnLocalTgHprSup,
        appnLocalTgIntersubnet,
        appnLocalTgMltgLinkType
    }

```

```

    STATUS current
    DESCRIPTION
        "A collection of objects providing the instrumentation of
        APPN local TG information."
    ::= { appnGroups 28 }

```

appnDirTableConfGroup2 OBJECT-GROUP

```

    OBJECTS {
        appnDirNnServerName,
        appnDirLuOwnerName,
        appnDirLuLocation,
        appnDirType,
        appnDirApparentLuOwnerName
    }

```

```

    STATUS current
    DESCRIPTION
        "A collection of objects providing the instrumentation of the
        APPN directory database."
    ::= { appnGroups 29 }

```

appnNnUniqueConfGroup OBJECT-GROUP

```

OBJECTS {
    appnNodeNnCentralDirectory,
    appnNodeNnTreeCache,
    appnNodeNnRouteAddResist,
    appnNodeNnIsr,
    appnNodeNnFrnsn,
    appnNodeNnPeriBorderSup,
    appnNodeNnInterchangeSup,
    appnNodeNnExteBorderSup,
    appnNodeNnSafeStoreFreq,
    appnNodeNnRsn,
    appnNodeNnCongested,
    appnNodeNnIsrDepleted,
    appnNodeNnQuiescing,
    appnNodeNnGateway
}
STATUS current
DESCRIPTION
    "A collection of objects providing instrumentation unique
    to APPN network nodes."
 ::= { appnGroups 6 }

appnEnUniqueConfGroup OBJECT-GROUP
    OBJECTS {
        appnNodeEnModeCosMap,
        appnNodeEnNnServer,
        appnNodeEnLuSearch
    }
    STATUS current
    DESCRIPTION
        "A collection of objects providing instrumentation for
        APPN end nodes.  Some of these objects also appear in the
        instrumentation for a branch network node."
    ::= { appnGroups 7 }

appnVrnConfGroup OBJECT-GROUP
    OBJECTS {
        appnVrnPortName
    }
    STATUS current
    DESCRIPTION
        "An object providing the instrumentation for virtual
        routing node support in an APPN node."
    ::= { appnGroups 8 }

appnNnTopoConfGroup2 OBJECT-GROUP
    OBJECTS {
        appnNnTopoMaxNodes,

```

```

appnNnTopoCurNumNodes,
appnNnTopoNodePurges,
appnNnTopoTgPurges,
appnNnTopoTotalTduWars,
appnNnNodeFREntryTimeLeft,
appnNnNodeFRType,
appnNnNodeFRRsn,
appnNnNodeFRRRouteAddResist,
appnNnNodeFRCongested,
appnNnNodeFRIsrDepleted,
appnNnNodeFRQuiescing,
appnNnNodeFRGateway,
appnNnNodeFRCentralDirectory,
appnNnNodeFRIsr,
appnNnNodeFRGarbageCollect,
appnNnNodeFRHprSupport,
appnNnNodeFRPeriBorderSup,
appnNnNodeFRInterchangeSup,
appnNnNodeFRExteBorderSup,
appnNnNodeFRBranchAwareness,
appnNnTgFREntryTimeLeft,
appnNnTgFRDestVirtual,
appnNnTgFRDlcData,
appnNnTgFRRsn,
appnNnTgFROperational,
appnNnTgFRQuiescing,
appnNnTgFRCpCpSession,
appnNnTgFREffCap,
appnNnTgFRConnCost,
appnNnTgFRByteCost,
appnNnTgFRSecurity,
appnNnTgFRDelay,
appnNnTgFRUsr1,
appnNnTgFRUsr2,
appnNnTgFRUsr3,
appnNnTgFRGarbageCollect,
appnNnTgFRSubareaNum,
appnNnTgFRHprSup,
appnNnTgFRDestHprTrans,
appnNnTgFRTypeIndicator,
appnNnTgFRIntersubnet,
appnNnTgFRMltgLinkType,
appnNnTgFRBranchTg
}

```

STATUS current

DESCRIPTION

"The appnNnTopoConfGroup is mandatory only for network nodes."

```
::= { appnGroups 30 }
```

```
appnLocalEntTopoConfGroup2    OBJECT-GROUP
```

```
    OBJECTS {
        appnLocalEntTgEntryTimeLeft,
        appnLocalEntTgDestVirtual,
        appnLocalEntTgDlcData,
        appnLocalEntTgOperational,
        appnLocalEntTgCpCpSession,
        appnLocalEntTgEffCap,
        appnLocalEntTgConnCost,
        appnLocalEntTgByteCost,
        appnLocalEntTgSecurity,
        appnLocalEntTgDelay,
        appnLocalEntTgUsr1,
        appnLocalEntTgUsr2,
        appnLocalEntTgUsr3,
        appnLocalEntTgMltgLinkType
    }
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "A collection of objects providing the instrumentation
        of the information that a network node possesses about
        the end nodes directly attached to it."
```

```
::= { appnGroups 31 }
```

```
appnLocalDirPerfConfGroup    OBJECT-GROUP
```

```
    OBJECTS {
        appnDirMaxCaches,
        appnDirCurCaches,
        appnDirCurHomeEntries,
        appnDirRegEntries,
        appnDirInLocates,
        appnDirInBcastLocates,
        appnDirOutLocates,
        appnDirOutBcastLocates,
        appnDirNotFoundLocates,
        appnDirNotFoundBcastLocates,
        appnDirLocateOutstands
    }
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "The appnLocalDirPerfConfGroup is mandatory only for APPN
        network nodes and end nodes."
```

```
::= { appnGroups 11 }
```

```
appnCcosConfGroup            OBJECT-GROUP
```

```
    OBJECTS {
```

```

appnCosModeCosName,
appnCosTransPriority,
appnCosNodeRowWgt,
appnCosNodeRowResistMin,
appnCosNodeRowResistMax,
appnCosNodeRowMinCongestAllow,
appnCosNodeRowMaxCongestAllow,
appnCostgRowWgt,
appnCostgRowEffCapMin,
appnCostgRowEffCapMax,
appnCostgRowConnCostMin,
appnCostgRowConnCostMax,
appnCostgRowByteCostMin,
appnCostgRowByteCostMax,
appnCostgRowSecurityMin,
appnCostgRowSecurityMax,
appnCostgRowDelayMin,
appnCostgRowDelayMax,
appnCostgRowUsr1Min,
appnCostgRowUsr1Max,
appnCostgRowUsr2Min,
appnCostgRowUsr2Max,
appnCostgRowUsr3Min,
appnCostgRowUsr3Max
}

```

STATUS current

DESCRIPTION

"The appnCosConfGroup is mandatory only for APPN network nodes and end nodes."

::= { appnGroups 12 }

```

appnIntSessConfGroup      OBJECT-GROUP
    OBJECTS {
        appnIsInGlobeCtrAdminStatus,
        appnIsInGlobeCtrOperStatus,
        appnIsInGlobeCtrStatusTime,
        appnIsInGlobeRscv,
        appnIsInGlobeRscvTime,
        appnIsInGlobeActSess,
        appnIsInSessState,
        appnIsInPriLuName,
        appnIsInSecLuName,
        appnIsInModeName,
        appnIsInCosName,
        appnIsInTransPriority,
        appnIsInSessType,
        appnIsInSessUpTime,
        appnIsInCtrUpTime,
    }

```

```

appnIsInP2SFmdPius,
appnIsInS2PFmdPius,
appnIsInP2SNonFmdPius,
appnIsInS2PNonFmdPius,
appnIsInP2SFmdBytes,
appnIsInS2PFmdBytes,
appnIsInP2SNonFmdBytes,
appnIsInS2PNonFmdBytes,
appnIsInPsAdjCpName,
appnIsInPsAdjTgNum,
appnIsInPsSendMaxBtuSize,
appnIsInPsSendPacingType,
appnIsInPsSendRpc,
appnIsInPsSendNxWndwSize,
appnIsInPsRecvPacingType,
appnIsInPsRecvRpc,
appnIsInPsRecvNxWndwSize,
appnIsInSsAdjCpName,
appnIsInSsAdjTgNum,
appnIsInSsSendMaxBtuSize,
appnIsInSsSendPacingType,
appnIsInSsSendRpc,
appnIsInSsSendNxWndwSize,
appnIsInSsRecvPacingType,
appnIsInSsRecvRpc,
appnIsInSsRecvNxWndwSize,
appnIsInRouteInfo
}

```

STATUS current

DESCRIPTION

"The appnIntSessConfGroup is mandatory only for network nodes."

::= { appnGroups 13 }

appnHprBaseConfGroup OBJECT-GROUP

```

OBJECTS {
    appnNodeHprIntRteSetups,
    appnNodeHprIntRteRejects,
    appnLsErrRecoSup,
    appnLsForAnrLabel,
    appnLsRevAnrLabel
}

```

STATUS current

DESCRIPTION

"The appnHprBaseConfGroup is mandatory only for nodes that implement the HPR base (APPN option set 1400)."

::= { appnGroups 14 }

```

appnHprRtpConfGroup      OBJECT-GROUP
    OBJECTS {
        appnNodeMaxSessPerRtpConn,
        appnNodeHprOrgRteSetups,
        appnNodeHprOrgRteRejects,
        appnNodeHprEndRteSetups,
        appnNodeHprEndRteRejects,
        appnLsBfNceId
    }
    STATUS      current
    DESCRIPTION
        "The appnHprRtpConfGroup is mandatory only for nodes that
        implement the HPR RTP tower (APPN option set 1401)."
```

::= { appnGroups 15 }

```

appnHprCtrlFlowsRtpConfGroup      OBJECT-GROUP
    OBJECTS {
        appnLsCpCpNceId,
        appnLsRouteNceId
    }
    STATUS      current
    DESCRIPTION
        "The appnHprCtrlFlowsRtpConfGroup is mandatory only for nodes
        that implement the HPR Control Flows over RTP tower (APPN
        option set 1402)."
```

::= { appnGroups 16 }

```

appnHprBfConfGroup      OBJECT-GROUP
    OBJECTS {
        appnIsInGlobeHprBfActSess,
        appnIsInRtpNceId,
        appnIsInRtpTcid,
        appnIsRtpSessions
    }
    STATUS      current
    DESCRIPTION
        "The appnHprBfConfGroup is mandatory only for nodes that
        implement the APPN/HPR boundary function."
```

::= { appnGroups 17 }

```

appnTrapConfGroup      OBJECT-GROUP
    OBJECTS {
        alertIdNumber,
        affectedObject
    }
    STATUS      current
    DESCRIPTION
        "The appnTrapConfGroup is optional for all APPN nodes.  Nodes
```

implementing this group shall also implement the
appnTrapNotifGroup."
 ::= { appnGroups 18 }

appnTrapNotifGroup NOTIFICATION-GROUP
 NOTIFICATIONS {
 alertTrap
 }
 STATUS current
 DESCRIPTION
 "The appnTrapNotifGroup is optional for all APPN nodes.
 Nodes implementing this group shall also implement the
 appnTrapConfGroup."
 ::= { appnGroups 19 }

appnBrNnConfGroup OBJECT-GROUP
 OBJECTS {
 appnNodeEnNnServer,
 appnNodeEnLuSearch,
 appnLocalTgBranchLinkType
 }
 STATUS current
 DESCRIPTION
 "A collection of objects providing instrumentation for
 branch network nodes. Some of these objects also appear
 in the instrumentation for an end node.

 Note: A branch network node always returns endNode(2)
 as the value of the appnNodeType object from the
 appnGeneralConfGroup2 conformance group."
 ::= { appnGroups 20 }

-- *****
-- Deprecated definitions
-- *****

appnNodeMibVersion OBJECT-TYPE
 SYNTAX DisplayString (SIZE (11))
 MAX-ACCESS read-only
 STATUS deprecated
 DESCRIPTION
 "The value of LAST-UPDATED from this module's MODULE-IDENTITY
 macro. This object gives a Management Station an easy way of
 determining the level of the MIB supported by an agent.

 Since this object incorporates the Year 2000-unfriendly
 2-digit year specified in SMI for the LAST-UPDATED field, and

since it was not found to be particularly useful, it has been deprecated. No replacement object has been defined."

```
::= { appnGeneralInfoAndCaps 2 }
```

```
appnCompliance MODULE-COMPLIANCE
```

```
STATUS deprecated
```

```
DESCRIPTION
```

```
"The compliance statement for the SNMPv2 entities that
implement the APPN MIB.
```

```

This is the compliance statement for the RFC 2155-level version
of the APPN MIB. It was deprecated as new objects were added
to the MIB for MLTG, branch network node, and other extensions
to the APPN architecture."
```

```
MODULE -- this module
```

```
-- Unconditionally mandatory groups
```

```
MANDATORY-GROUPS {
    appnGeneralConfGroup,
    appnPortConfGroup,
    appnLinkConfGroup,
    appnLocalTgConfGroup,
    appnDirTableConfGroup
}
```

```
-- Conditionally mandatory groups
```

```
GROUP appnNnUniqueConfGroup
```

```
DESCRIPTION
```

```
"The appnNnUniqueConfGroup is mandatory only for
network nodes."
```

```
GROUP appnEnUniqueConfGroup
```

```
DESCRIPTION
```

```
"The appnEnUniqueConfGroup is mandatory only for end
nodes."
```

```
GROUP appnVrnConfGroup
```

```
DESCRIPTION
```

```
"The appnVrnConfGroup is mandatory only for network
nodes and end nodes that implement virtual routing
node support."
```

```
GROUP appnNnTopoConfGroup
```

```
DESCRIPTION
```

```
"The appnNnTopoConfGroup is mandatory only for
network nodes."
```

GROUP appnLocalEnTopoConfGroup
DESCRIPTION
 "The appnLocalEnTopoConfGroup is mandatory only for network nodes."

GROUP appnLocalDirPerfConfGroup
DESCRIPTION
 "The appnLocalDirPerfConfGroup is mandatory only for APPN network nodes and end nodes."

GROUP appnCosConfGroup
DESCRIPTION
 "The appnCosConfGroup is mandatory only for APPN network nodes and end nodes."

GROUP appnIntSessConfGroup
DESCRIPTION
 "The appnIntSessConfGroup is mandatory only for network nodes."

GROUP appnHprBaseConfGroup
DESCRIPTION
 "The appnHprBaseConfGroup is mandatory only for nodes that implement the HPR base (APPN option set 1400)."

GROUP appnHprRtpConfGroup
DESCRIPTION
 "The appnHprRtpConfGroup is mandatory only for nodes that implement the HPR RTP tower (APPN option set 1401)."

GROUP appnHprCtrlFlowsRtpConfGroup
DESCRIPTION
 "The appnHprCtrlFlowsRtpConfGroup is mandatory only for nodes that implement the HPR Control Flows over RTP tower (APPN option set 1402)."

GROUP appnHprBfConfGroup
DESCRIPTION
 "The appnHprBfConfGroup is mandatory only for nodes that implement the APPN/HPR boundary function."

GROUP appnTrapConfGroup
DESCRIPTION
 "Traps are optional for all nodes."

GROUP appnTrapNotifGroup
DESCRIPTION
 "Traps are optional for all nodes."

```
::= { appnCompliances 1 }
```

```
appnGeneralConfGroup OBJECT-GROUP
```

```
OBJECTS {
    appnNodeCpName,
    appnNodeMibVersion,
    appnNodeId,
    appnNodeType,
    appnNodeUpTime,
    appnNodeParallelTg,
    appnNodeAdaptiveBindPacing,
    appnNodeHprSupport,
    appnNodeCounterDisconTime
}
```

```
STATUS deprecated
```

```
DESCRIPTION
```

"A collection of objects providing the instrumentation of APPN general information and capabilities.

This RFC 2155-level group was deprecated when the appnNodeMibVersion object was removed and the appnNodeLsCounterType and appnNodeBrNn objects were added."

```
::= { appnGroups 1 }
```

```
appnLinkConfGroup OBJECT-GROUP
```

```
OBJECTS {
    appnLsCommand,
    appnLsOperState,
    appnLsPortName,
    appnLsDlcType,
    appnLsDynamic,
    appnLsAdjCpName,
    appnLsAdjNodeType,
    appnLsTgNum,
    appnLsLimResource,
    appnLsActOnDemand,
    appnLsMigration,
    appnLsPartnerNodeId,
    appnLsCpCpSessionSupport,
    appnLsMaxSendBtuSize,
    appnLsInXidBytes,
    appnLsInMsgBytes,
    appnLsInXidFrames,
    appnLsInMsgFrames,
    appnLsOutXidBytes,
    appnLsOutMsgBytes,
    appnLsOutXidFrames,
    appnLsOutMsgFrames,
}
```

```

appnLsEchoRsps,
appnLsCurrentDelay,
appnLsMaxDelay,
appnLsMinDelay,
appnLsMaxDelayTime,
appnLsGoodXids,
appnLsBadXids,
appnLsSpecific,
appnLsActiveTime,
appnLsCurrentStateTime,
appnLsHprSup,
appnLsLocalAddr,
appnLsRemoteAddr,
appnLsRemoteLsName,
appnLsStatusTime,
appnLsStatusLsName,
appnLsStatusCpName,
appnLsStatusPartnerId,
appnLsStatusTgNum,
appnLsStatusGeneralSense,
appnLsStatusRetry,
appnLsStatusEndSense,
appnLsStatusXidLocalSense,
appnLsStatusXidRemoteSense,
appnLsStatusXidByteInError,
appnLsStatusXidBitInError,
appnLsStatusDlcType,
appnLsStatusLocalAddr,
appnLsStatusRemoteAddr,
appnLsCounterDisconTime
}

```

STATUS deprecated

DESCRIPTION

"A collection of objects providing the instrumentation of APPN link information.

This RFC 2155-level group was deprecated when the appnLsMltgMember object was added."

```
::= { appnGroups 3 }
```

appnLocalTgConfGroup OBJECT-GROUP

```

OBJECTS {
    appnLocalTgDestVirtual,
    appnLocalTgDlcData,
    appnLocalTgPortName,
    appnLocalTgQuiescing,
    appnLocalTgOperational,

```

```

    appnLocalTgCpCpSession,
    appnLocalTgEffCap,
    appnLocalTgConnCost,
    appnLocalTgByteCost,
    appnLocalTgSecurity,
    appnLocalTgDelay,
    appnLocalTgUsr1,
    appnLocalTgUsr2,
    appnLocalTgUsr3,
    appnLocalTgHprSup,
    appnLocalTgIntersubnet
  }

```

STATUS deprecated

DESCRIPTION

"A collection of objects providing the instrumentation of APPN local TG information.

This RFC 2155-level group was deprecated when the appnLocalTgMltgLinkType object was added."

```
 ::= { appnGroups 4 }
```

appnDirTableConfGroup OBJECT-GROUP

```

  OBJECTS {
    appnDirNnServerName,
    appnDirLuOwnerName,
    appnDirLuLocation,
    appnDirType
  }

```

STATUS deprecated

DESCRIPTION

"A collection of objects providing the instrumentation of the APPN directory database.

This RFC 2155-level group was deprecated when the appnDirApparentLuOwnerName object was added."

```
 ::= { appnGroups 5 }
```

appnNnTopoConfGroup OBJECT-GROUP

```

  OBJECTS {
    appnNnTopoMaxNodes,
    appnNnTopoCurNumNodes,
    appnNnTopoNodePurges,
    appnNnTopoTgPurges,
    appnNnTopoTotalTduWars,
    appnNnNodeFREntryTimeLeft,
    appnNnNodeFRType,
  }

```

```

appnNnNodeFRRsn,
appnNnNodeFRRRouteAddResist,
appnNnNodeFRCongested,
appnNnNodeFRIsrDepleted,
appnNnNodeFRQuiescing,
appnNnNodeFRGateway,
appnNnNodeFRCentralDirectory,
appnNnNodeFRIsr,
appnNnNodeFRGarbageCollect,
appnNnNodeFRHprSupport,
appnNnNodeFRPeriBorderSup,
appnNnNodeFRInterchangeSup,
appnNnNodeFRExteBorderSup,
appnNnTgFREntryTimeLeft,
appnNnTgFRDestVirtual,
appnNnTgFRDlcData,
appnNnTgFRRsn,
appnNnTgFROperational,
appnNnTgFRQuiescing,
appnNnTgFRCpCpSession,
appnNnTgFREffCap,
appnNnTgFRConnCost,
appnNnTgFRByteCost,
appnNnTgFRSecurity,
appnNnTgFRDelay,
appnNnTgFRUsr1,
appnNnTgFRUsr2,
appnNnTgFRUsr3,
appnNnTgFRGarbageCollect,
appnNnTgFRSubareaNum,
appnNnTgFRHprSup,
appnNnTgFRDestHprTrans,
appnNnTgFRTypeIndicator,
appnNnTgFRIntersubnet
}

```

STATUS deprecated

DESCRIPTION

"The appnNnTopoConfGroup is mandatory only for network nodes.

This RFC 2155-level group was deprecated when the appnNnNodeFRBranchAwareness, appnNnTgFRMltgLinkType, and appnNnFRBranchTg objects were added."

::= { appnGroups 9 }

```

appnLocalEnTopoConfGroup  OBJECT-GROUP
    OBJECTS {

```

```

        appnLocalEntGEntryTimeLeft,
        appnLocalEntGDestVirtual,
        appnLocalEntGDlcData,
        appnLocalEntGOperational,
        appnLocalEntGCpCpSession,
        appnLocalEntGEffCap,
        appnLocalEntGConnCost,
        appnLocalEntGByteCost,
        appnLocalEntGSecurity,
        appnLocalEntGDelay,
        appnLocalEntGUsr1,
        appnLocalEntGUsr2,
        appnLocalEntGUsr3
    }
    STATUS deprecated
    DESCRIPTION
        "The appnLocalEntTopoConfGroup is mandatory only for network
        nodes.
```

This RFC 2155-level group was deprecated when the appnLocalEntGMLTgLinkType object was added."

```
 ::= { appnGroups 10 }
```

END

5. Security Considerations

Certain management information defined in this MIB may be considered sensitive in some network environments. Therefore, authentication of received SNMP requests and controlled access to management information SHOULD be employed in such environments. An authentication protocol is defined in [12]. A protocol for access control is defined in [15].

The read-only objects appnNnTgFRSecurity, appnLocalTgSecurity, appnLocalEntTgSecurity, appnCosTgRowSecurityMin, and appnCosTgRowSecurityMax can be used to determine the potential path of secure data. While these objects cannot be changed by a management application using this MIB, these objects could be used to determine where a security exposure exists due to an improper configuration on the agent.

None of the other read-only objects in the APPN MIB reports a password, user data, or anything else that is particularly sensitive. Some enterprises view their network configuration itself, as well as

information about network usage and performance, as corporate assets; such enterprises may wish to restrict SNMP access to most of the objects in the MIB.

Four of the read-write objects in the MIB can affect network operations; it is recommended that SNMP access to these objects be restricted. The four objects are:

- o appnNodeNnSafeStoreFreq: Setting this object to 0, or to a very large value, effectively turns off safe storing of topology data.
- o appnPortCommand, appnLsCommand: These two objects allow an APPN port or link station to be activated, deactivated, or recycled via an SNMP operation. The latter two operations may disrupt current users of the network.
- o appnIsInSessState: Setting this object to 'inactive' causes an active SNA session to be deactivated.

Other read-write objects control the gathering of network management data; controlling access to these objects is less critical.

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7. Acknowledgments

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