Definitions of Managed Objects
for Extended Border Node

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 Network) EBN (Extended Border Node) capabilities. This memo identifies managed objects for the EBN architecture.

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1.0 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) Extended Border Node (EBN) 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, reference [13].

2.0 The SNMP Network Management Framework

The SNMP Network Management Framework presently consists of six major components. They are:

- the overall architecture, described in RFC 2271 [7].
- the SMI, described in RFC 1902 [3], - the mechanisms used for describing and naming objects for the purpose of management.
- the MIB-II, STD 17, RFC 1213 [2], - the core set of managed objects for the Internet suite of protocols.
- the user-based security model defined in RFC 2274 [10].
- the view-based access control model defined in RFC 2275 [11].

Textual conventions are defined in RFC 1903 [4], and conformance statements are defined in RFC 1904 [5]. Common applications are defined in RFC 2273 [9].

The Framework permits new objects to be defined for the purpose of experimentation and evaluation.

This memo specifies a MIB module that is compliant to the SMIPv2. A MIB conforming to the SMIPv1 can be produced through the appropriate translation.
3.0 Overview

This document identifies the proposed set of objects for monitoring the configuration and active characteristics of devices with EBN capabilities. The Extended Border Node function is an APPN enhancement for an APPN network node (NN). It supports topology isolation, subnet interconnection, and session establishment between subnets.

In a single APPN network, all network topology information is propagated to all network nodes. Directory searches can also be forwarded to all network nodes. As the network grows, this network traffic could become prohibitive. Also, in networks where different enterprises are connected via APPN, it may be desirable to shield an enterprise from the network traffic of another enterprise. EBNs allow customers to partition a network into subnets to reduce or shield such network traffic.

An EBN provides this function by blocking topology information exchange between subnets, and controlling where directory searches are forwarded. A subnetwork is a cluster of APPN NNs which share the same network topology. Subnetwork boundaries, or partitions, occur where an EBN and an NN adjacent to it have different network identifiers (NETIDs). They may also occur where an EBN and adjacent NN have the same NETID but are configured to have a subnetwork boundary.

The connection between two APPN nodes is an APPN transmission group (TG). A TG at a subnet boundary is called an Intersubnetwork Transmission Group (ISTG).

The subnet in which an EBN resides is called its native subnetwork. The subnet across the subnet boundary is called the non-native subnetwork, with respect to the EBN.

A cost of the EBN function is that customers may have difficulty determining the end-to-end route of sessions that cross subnet boundaries, and understanding how the EBN will control directory searches between subnets. This MIB addresses these issues.

Another challenge facing customers is to identify subnet boundaries formed by EBNs. The SNANAU APPN MIB [14] identifies subnet boundaries in the appnNnTopology group. The SNANAU APPN MIB provides management of APPN objects, and contains some tables that are extended by this MIB.

In this document, we describe EBN managed objects.
The EBN terms and overall architecture are available from the networking.raleigh.ibm.com ftp site [15].

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

- Identifying the subnet affiliation of LUs (logical units)
- Identifying session routes in non-native subnets, with correlation to the route in the native subnet provided in the SNANAU APPN MIB.
- Identifying the COS (Class of Service) mappings between subnets.
- Identifying the subnet routing lists

This MIB module does not support:

- Configuration of EBN nodes.
- Historical information about session initiation failures.
- Peripheral Border Node (PBN) support. PBN is an APPN function that only supports communication to adjacent subnetworks, and is not expected to be widely implemented.
- Traps. The APPN MIB contains a trap for Alert conditions that may affect EBN resources. Although no APPN/EBN Alerts are defined today in the APPN MIB [14], they could exist in the future. The value for the affectedObject object contained in the alertTrap is determined by the implementation. It may contain a VariablePointer from the EBN MIB.

### 3.1 EBN MIB Structure

The EBN MIB module contains the following groups of objects:

- **ebnDir** - subnet information about LUs.
- **ebnIsRscv** - provides the RSCV (Route Selection Control Vector) and COS for the subnetwork on the BIND destination side of the EBN.
- **ebnDirConfig** - objects related to the EBN directory.
- **ebnCos** - COS mapping between subnetworks,
o ebnSubnetRoutingList - the customer-supplied list of where to forward search requests.

o hbn - HPR (High Performance Routing) EBN intermediate session information.

These groups are described below in more detail.

3.1.1 enbDir group

The enbDir group contains the enbDirTable, which is an extension to the appnDirTable. It specifies the subnet affiliation of LUs in the EBN’s directory.

3.1.2 ebnIsRscv group

The ebnIsRscv group contains the ebnIsRscvTable, which is an extension to the appnIsInTable. The appnIsInTable only allows for the RSCV and COS name for one subnetwork traversed by a session. This extension contains the RSCV and COS name for the other subnetwork.

When an EBN changes RSCVs before forwarding a BIND, appnIsInRouteInfo contains the incoming RSCV, and ebnIsRscvDestinationRoute contains the outgoing RSCV.

The following three cases illustrate the contents of appnIsInRouteInfo and ebnIsRscvDestinationRoute at Extended Border Nodes.

1. EBN connected to another EBN

   **subnet 1**|-----ISTG ------|**subnet 2**
   EBN1         EBN2
   PLU          SLU
   ------------------------>
   (1)                  (2)
   |------------------|
   (3)

   PLU = Primary Logical Unit (session initiator)
   SLU = Secondary Logical Unit (session destination)

   The value of the appnIsInRouteInfo object at EBN1 is the RSCV containing the route, represented by (1), from the PLU (or the entry EBN in its subnet) to EBN2. The value of ebnIsRscvDestinationRoute object at EBN1 is the RSCV, represented by (2), containing the one-hop route from EBN1 to EBN2. The
appnIsInRouteInfo object at EBN2 also contains the RSCV represented by (2). The value of ebnIsRscvDestinationRoute in EBN2 is the RSCV containing the route to the SLU (or to the next subnet’s entry EBN), represented by (3).

2. EBN connected to a NN or PBN

**subnet 1**|-----ISTG ------|**subnet 2**

EBN1          NN/PBN

PLU                                    SLU

---------------------------->|

(1) |--------------------------->

(2)

The value of the appnIsInRouteInfo object at EBN1 is the RSCV containing the route from the PLU (or the entry EBN in its subnet) to the NN or PBN, represented by (1). The value of the ebnIsRscvDestinationRoute object at EBN1 is the RSCV containing the route from EBN1 to the SLU, represented by (2). Note that the SLU must be in subnet 2, because the entry node is an NN or PBN rather than an EBN. The appnIsInRouteInfo object at NN/PBN contains the same RSCV, as represented by (2).

3. NN or PBN connected to EBN

**subnet 1**|-----ISTG ------|**subnet 2**

NN/PBN          EBN1

PLU                                    SLU

---------------------------->|

(1) |-------->

(2)

The value of the appnIsInRouteInfo object at the NN/PBN is the RSCV containing the route from the PLU to EBN1, represented by (1). Note that the PLU must be in subnet 1, because the exit node is an NN/PBN rather than an EBN. The appnIsInRouteInfo object at EBN1 contains the same RSCV. The value of the ebnIsRscvDestinationRoute object at EBN1 is the RSCV containing the route from EBN1 to the SLU (or the next subnet’s entry border node), as represented by (2).

The following three cases illustrate the contents of ebnIsRscvDestinationCos at Extended Border Nodes.
1. EBN connected to another EBN

```
**subnet 1**|-----ISTG ------|**subnet 2**
EBN1             EBN2
PLU                                    SLU
COS A
------------------------>|                COS B
                      |------------------------>
```

PLU = Primary Logical Unit (session initiator)
SLU = Secondary Logical Unit (session destination)

The value of ebnIsRscvDestinationCos object at EBN1 is COS A.
The value of ebnIsRscvDestinationCos object at EBN2 is COS B.

2. EBN connected to a NN or PBN

```
**subnet 1**|-----ISTG ------|**subnet 2**
EBN1            NN/PBN
PLU                                    SLU
COS A
------------------------>|                COS B
                      |------------------------>
```

The value of the ebvIsRscvDestinationCos object at EBN1 is COS B.

3. NN or PBN connected to EBN

```
**subnet 1**|-----ISTG ------|**subnet 2**
NN/PBN       EBN1
PLU                                    SLU
COS A
------------------------>|                COS B
                      |------------------------>
```

The value of the ebnIsRscvDestinationCos object at the EBN2 is COS B.

3.1.3 ebnDirConfig group

The ebnDirConfig group consists of simple objects that provide EBN-specific information about directory caching and the local default value for the maximum number of subnetworks a LOCATE search procedure may traverse.
3.1.4 ebnCos group

The ebnCos group contains the ebnCosMapTable, which specifies how COS values are mapped between the non-native subnetwork and the native subnetwork.

3.1.5 ebnSubnetRoutingList group

The ebnSubnetRoutingList group contains information about the customer-supplied EBN subnetwork routing list, which indicates to which adjacent nodes an EBN will forward LOCATE search requests. It consists of the following tables:

1. ebnSubnetSearchTable

   This table has an entry for each LU name that has a defined subnet routing list. The LU name may identify a single LU, or it may contain a wildcard character that could identify a group of LUs (partial wildcard) or all LUs (full wildcard). The objects in the table indicate whether the EBN may add dynamic entries to the subnet routing list, and whether the subnet routing list entries may be reordered for better search performance.

2. ebnSearchTable

   This table has an entry for each control point name which is included in a multi-subnet search for a particular LU name. The index to the table is the LU name to be searched for, and an index which lists the order in which the CP names are to be searched. Both the CP name and the LU name entries in the table allow for partial and full wildcards. The CP name also allows for special entries that indicate that the EBN will search itself and its own native subnetwork at this point in the search, or will search all native EBNs.

3.1.6 hbn group

The hbn group contains information about HBN (HPR EBN) intermediate sessions. The hbnIsInTable is an extension to the appnIsInTable. This table is present for intermediate sessions when there are back-to-back RTP (Rapid Transport Protocol) connections in an HBN. It provides the NCE ID (network connection endpoint identifier) and TCID (transport connection identifier) for the second RTP connection.
4.0 Definitions

EBN-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, Unsigned32
FROM SNMPv2-SMI

MODULE-COMPLIANCE, OBJECT-GROUP
FROM SNMPv2-CONF

DisplayString, TEXTUAL-CONVENTION
FROM SNMPv2-TC

SnaControlPointName
-- Because the characters allowed in an SNA control
-- point name come from a restricted character set,
-- these names are not subject to internationalization.
FROM APPN-MIB

snanauMIB FROM SNA-NAU-MIB;

ebnMIB MODULE-IDENTITY
LAST-UPDATED "9804281800Z" -- April 28, 1998
ORGANIZATION "IETF SNA NAU MIB WG / AIW APPN MIBs SIG"
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DESCRIPTION
"The MIB Module for Extended Border Node"

 ::= ( snanauMIB 7 )

-- snanauMIB ::= { mib-2 34 }
--- ************************************************************
--- Textual Conventions
--- -------------------------------------------------------------------------------------------------------
SnaNAUWildcardName ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"Fully-qualified network NAU name. 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 NAU Name.
- A full wildcard consists of a single character ‘*’.

Because the characters allowed in an SNA NAU name come from a restricted character set, these names are not subject to internationalization."

SYNTAX DisplayString(SIZE(1..17))

--- *******************************************************
ebnObjects OBJECT IDENTIFIER ::= { ebnMIB 1 }
--- *******************************************************

--- *******************************************************
ebnDir OBJECT IDENTIFIER ::= { ebnObjects 1 }
--- *******************************************************

ebnDirTable OBJECT-TYPE
SYNTAX SEQUENCE OF EbnDirEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The EBN Directory Table. This table is an extension to the APPN MIB’s appnDirTable. Entries in this table are in one-to-one correspondence with entries in the appnDirTable, with corresponding entries having identical values for their respective indexes."
 ::= { ebnDir 1 }

EbnDirEntry OBJECT-TYPE
SYNTAX EbnDirEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Entry in the EBN Directory Table."

INDEX { ebnDirLuName }

::= { ebnDirTable 1 }

EbnDirEntry ::= SEQUENCE {
  ebnDirLuName             SnaNAUWildcardName,
  ebnDirSubnetAffiliation  INTEGER     }

ebnDirLuName OBJECT-TYPE
SYNTAX SnaNAUWildcardName
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Fully qualified network LU name in the domain of a serving
network node.  If this object has the same value as the
appnDirLuName object in the APPN MIB, then the two objects
are referring to the same LU."

::= { ebnDirEntry 1 }

ebnDirSubnetAffiliation OBJECT-TYPE
SYNTAX INTEGER {
  native (1),
  nonNative (2),
  subarea (3) }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Specifies the subnetwork affiliation of the LU:
- native(1)   : The LU is in the native APPN subnetwork.
- nonNative(2) : The LU is in a non-native APPN subnetwork.
- subarea(3)   : The LU is in a subarea network."

::= { ebnDirEntry 2 }

-- ******************************************************************
-- EBN Intermediate Session RSCV Group
-- This table is a sparse extension to the appnIsInTable.  For
-- sessions crossing ISTGs adjacent to the EBN, it contains the RSCV
-- and COS used in the direction of the BIND destination.
-- ******************************************************************

ebnIsRscv OBJECT IDENTIFIER ::= { ebnObjects 2 }

ebnIsRscvTable OBJECT-TYPE
SYNTAX SEQUENCE OF EbnIsRscvEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The EBN Intermediate Session RSCV table. This table is an extension to the appnIsInTable. It contains the RSCV and COS used in the direction of the BIND destination. There is an entry in this table for each session that traverses an ISTG when it enters or leaves this EBN, with corresponding entries having identical values for their respective indexes."

::= { ebnIsRscv 1}

ebnIsRscvEntry OBJECT-TYPE
SYNTAX EbnIsRscvEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Entry in ebnIsRscvTable."
INDEX { ebnIsRscvCpName, ebnIsRscvPcid } ::= { ebnIsRscvTable 1 }

EbnIsRscvEntry ::= SEQUENCE {
  ebnIsRscvCpName            SnaControlPointName,
  ebnIsRscvPcid              OCTET STRING,
  ebnIsRscvDestinationRoute  OCTET STRING,
  ebnIsRscvDestinationCos    DisplayString }

ebnIsRscvCpName 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 DLUR resources it is the name of the owning SSCP. If this object has the same value as the appnIsInFqCpName object in the APPN MIB, then the two objects are referring to the same APPN control point."

::= { ebnIsRscvEntry 1 }
ebnIsRscvPcid 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-octet value. 

If this object has the same value as the appnIsInPcid object 
in the APPN MIB, and if the corresponding ebnIsRscvCpName 
object has the same value as the corresponding 
appnIsInFqCpName object, then the entries indexed by these 
objects are referring to the same session."

 ::= { ebnIsRscvEntry 2 }

ebnIsRscvDestinationRoute OBJECT-TYPE  
SYNTAX OCTET STRING(SIZE (0..255))  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"The route selection control vector (RSCV x‘2B’) used in the 
direction towards the SLU."

 ::= { ebnIsRscvEntry 3 }

ebnIsRscvDestinationCos OBJECT-TYPE  
SYNTAX DisplayString (SIZE (1..8))  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"The Class of Service (COS) name used in the direction 
towards the SLU. 

Because the characters allowed in an SNA COS name come from 
a restricted character set, these names are not subject to 
internationalization."

 ::= { ebnIsRscvEntry 4 }

-- ******************************************************************
-- EBN Directory Config Group
-- The following simple objects provide information about EBN
-- directory.
-- ******************************************************************

ebnDirConfig OBJECT IDENTIFIER ::= { ebnObjects 3 }
ebnSearchCacheTime OBJECT-TYPE
SYNTAX Unsigned32
UNITS "minutes"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The amount of time in minutes an extended border node will retain information about a multi-subnetwork search, once that search terminates. A value 0 indicates that the EBN has no defined limit, and the number of entries is bounded only by memory."

::= { ebnDirConfig 1 }

ebnMaxSearchCache OBJECT-TYPE
SYNTAX Unsigned32
UNITS "entries"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The maximum number of multi-subnet entries to be cached. The value 0 indicates that the local node has no defined limit, and the number of entries is bounded only by memory."

::= { ebnDirConfig 2 }

ebnDefaultSubnetVisitCount OBJECT-TYPE
SYNTAX Unsigned32
UNITS "topology subnetworks"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The default maximum number of subnetworks a LOCATE search procedure may traverse."

::= { ebnDirConfig 3 }

-- ************************************************
-- EBN COS Mapping Group
-- The ebnCosMap Table specifies how non-native COS values are mapped
to COS values defined in the native subnetwork. The COS mappings
depend on multiple factors, one of which is set of user-defined mappings. This table returns the
COS mappings that the EBN is actually performing, rather than
the user-defined mappings.
-- ************************************************

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ebnCOS

OBJECT IDENTIFIER ::= { ebnObjects 4 }

ebnCosMapTable OBJECT-TYPE
SYNTAX SEQUENCE OF EbnCosMapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The EBN COS Mapping Table. This table specifies how non-native COS values are mapped to COS values defined in the native subnetwork.

Note: The COS mappings that an EBN performs are determined by multiple factors, one of which is a set of user-defined initial mappings. This table returns the COS mappings that the EBN is actually performing at the time it is queried, rather than the user-defined initial ones."

::= { ebnCOS 1 }

ebnCosMapEntry OBJECT-TYPE
SYNTAX EbnCosMapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"An entry in the EBN COS Mapping table."

INDEX { ebnCosMapCpName, ebnCosMapNonNativeCos }

 ::= { ebnCosMapTable 1 }

EbnCosMapEntry ::= SEQUENCE {
  ebnCosMapCpName              SnaNAUWildcardName,
  ebnCosMapNonNativeCos        DisplayString,
  ebnCosMapNativeCos           DisplayString }

ebnCosMapCpName OBJECT-TYPE
SYNTAX SnaNAUWildcardName
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Fully qualified network CP name for which the COS mapping applies."

 ::= { ebnCosMapEntry 1 }

ebnCosMapNonNativeCos OBJECT-TYPE
SYNTAX DisplayString (SIZE(1..8))
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This object contains one of the following values:

- An 8-character COS name used in a non-native subnetwork.
- The single character '*', identifying the entry with the
default native COS for a non-native CP name. This entry
  is used when there is no entry in the table for a
  non-native CP name / non-native COS pair.

Because the characters allowed in an SNA COS name come from
a restricted character set, these names are not subject to
internationalization."

 ::= { ebnCosMapEntry 2 }

ebnCosMapNativeCos OBJECT-TYPE
SYNTAX DisplayString (SIZE(1..8))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"An 8-byte name for the class-of-service, as known in the
native subnetwork.

Because the characters allowed in an SNA COS name come from
a restricted character set, these names are not subject to
internationalization."

 ::= { ebnCosMapEntry 3 }

-- ******************************************************************
-- EBN Subnet Routing List Group
-- The EBN Subnet Routing List indicates to which nodes an EBN
-- forwards search request. This group contains information
-- pertaining to the CONFIGURED Subnet Routing List at an EBN. How a
-- particular search request is routed is determined by a transient
-- list that the EBN creates based on the configured list and other
-- factors.
-- ******************************************************************

ebnSubnetRoutingList OBJECT IDENTIFIER ::= { ebnObjects 5 }

ebnSubnetSearchTable OBJECT-TYPE
SYNTAX SEQUENCE OF EbnSubnetSearchEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This table contains one entry for each fully qualified LU name for which an associated subnet routing list has been defined. An entry in this table contains general characteristics of the subnet search routing list for an LU name. The routing list itself is represented by a set of contiguous entries in the ebnSearchTable."

::= { ebnSubnetRoutingList 1 }  

ebnSubnetSearchEntry OBJECT-TYPE
SYNTAX EbnSubnetSearchEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"An entry for the ebnSubnetSearchTable. The entry represents the configured parameters the EBN uses when it is determining how to search for the LU identified by the ebnSubnetSearchLuName object."

INDEX { ebnSubnetSearchLuName }

::= { ebnSubnetSearchTable 1 }

EbnSubnetSearchEntry ::= SEQUENCE {
  ebnSubnetSearchLuName   SnaNAUWildcardName,
  ebnSubnetSearchDynamics INTEGER,
  ebnSubnetSearchOrdering INTEGER   }

ebnSubnetSearchLuName OBJECT-TYPE
SYNTAX SnaNAUWildcardName
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Fully qualified network LU name."

::= { ebnSubnetSearchEntry 1 }

ebnSubnetSearchDynamics OBJECT-TYPE
SYNTAX INTEGER { none(1),
  limited (2),
  full (3) }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates whether an EBN may add dynamic entries to a subnetwork routing list. none(1) means no entries may be added to the subnetwork routing list. limited(2) means only likely entries may be added to the subnetwork routing
list. full(3) means all native extended border nodes and adjacent, non-native EBNs and NNs will be added to the subnetwork routing list."

::= { ebnSubnetSearchEntry 2 }

ebnSubnetSearchOrdering OBJECT-TYPE
SYNTAX INTEGER{ priority(1), defined(2) }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates whether an EBN may reorder a subnetwork routing list so that entries which are more likely to be successful move to the top of the subnetwork routing list and entries which are more likely to be unsuccessful move to the bottom of the list.
The following values are defined:

- priority(1): Entries may be reordered.
- defined(2): Entries must not be reordered."

::= { ebnSubnetSearchEntry 3 }

-- Border node search table

ebnSearchTable OBJECT-TYPE
SYNTAX SEQUENCE OF EbnSearchEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This table indicates the CONFIGURED list of control points to which the EBN sends Locate searches for a given fully qualified LU name. Each entry in the table indicates one control point that should be included in a multi-subnet search for a particular LU name."

::= { ebnSubnetRoutingList 2 }

ebnSearchEntry OBJECT-TYPE
SYNTAX EbnSearchEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"An entry in the ebnSearchTable. An entry can exist in this table only if an entry exists in the ebnSubnetSearchTable with an ebnSubnetSearchLuName value matching this entry’s ebnSearchLuName."
For a given ebnSearchLuName value, the ordering of entries provides by the ebnSearchIndex values corresponds to the order in which the control points to be searched appear in the CONFIGURED search list for the ebnSearchLuName.

INDEX { ebnSearchLuName, 
        ebnSearchIndex }

::= { ebnSearchTable 1 }

EbnSearchEntry ::= SEQUENCE {
    ebnSearchLuName  SnaNAUWildcardName,
    ebnSearchIndex   Unsigned32,
    ebnSearchCpName  DisplayString,
    ebnSearchSNVC    Unsigned32
}

ebnSearchLuName OBJECT-TYPE
SYNTAX SnaNAUWildcardName
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Fully qualified network LU name. If this object has the same value as the ebnSubnetSearchLuName object, then the two objects are referring to the same LU."

::= { ebnSearchEntry 1 }

ebnSearchIndex OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Secondary index enumerating the CONFIGURED order in which a search is forwarded to CPs for a particular LU name. The order for an actual search is determined dynamically by the EBN, based on this configured information and on other factors, including whether search dynamics and search ordering are enabled. Information on these last two settings is available in, respectively, the ebnSubnetSearchDynamics and ebnSubnetSearch ordering objects."

::= { ebnSearchEntry 2 }

ebnSearchCpName OBJECT-TYPE
SYNTAX DisplayString(SIZE(1..17))
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This object specifies the CP(s) to which a search should be forwarded. It either follows the SnaNAUWildcardName textual convention or takes one of the following special formats:

'-*-' indicates that all native EBNs and all adjacent non-native EBNs and NNs may be added to the routing list dynamically,

'*SELF' indicates that the EBN should search itself and its native subnetwork at this time during the cross-subnet search,

'*EBNS' indicates all native EBNs.

Because the characters allowed in a CP name come from a restricted character set, and because the three formats listed here use no special characters, this object is not subject to internationalization."

::= { ebnSearchEntry 3 }

ebnSearchSNVC OBJECT-TYPE
SYNTAX Unsigned32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The maximum number of subnets a Locate search procedure may traverse."

::= { ebnSearchEntry 4 }

-- *******************************************************************
-- HPR Extended Border Node Intermediate Session Group
-- The hbnIsInTable is a sparse extension to the appnIsInTable.
-- For sessions that use back-to-back RTP connections in an HBN,
-- this table provides the network connection endpoint identifier
-- (NceId) and the transport connection identifier (Tcid) for the
-- second RTP connection.
-- *******************************************************************

hbn                     OBJECT IDENTIFIER ::= { ebnObjects 6 }

hbnIsInTable OBJECT-TYPE
SYNTAX SEQUENCE OF HbnIsInEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The HBN Intermediate Session table."
::= { hbn 1 }

hbnIsInEntry OBJECT-TYPE
SYNTAX HbnIsInEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Entry of the HBN Intermediate Session Table. An entry exists in this table for every intermediate session being routed between back-to-back RTP connections in the HBN.

When an entry for a session exists in this table, the NceIds and Tcids for the back-to-back RTP connections are made available in the following four objects:

RTP connection in the direction of the PLU:
- NceId: appnIsInRtpNceId (in the APPN MIB)
- Tcid: appnIsinRtpTcid (in the APPN MIB).

RTP connection in the direction of the SLU:
- NceId: hbnIsInRtpNceId (in this table)
- Tcid: hbnIsInRtpTcid (in this table)."

INDEX { hbnIsInFqCpName, hbnIsInPcid }

::= { hbnIsInTable 1 }

HbnIsInEntry ::= SEQUENCE {
    hbnIsInFqCpName SnaControlPointName,
    hbnIsInPcid OCTET STRING,
    hbnIsInRtpNceId OCTET STRING,
    hbnIsInRtpTcid OCTET STRING }

hbnIsInFqCpName 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 the 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.

If this object has the same value as the appnIsInFqCpName object in the APPN MIB, then the two objects are referring to the same APPN control point."
hbnIsInPcid 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-octet value.
If this object has the same value as the appnIsInPcid object in the APPN MIB, and if the corresponding hbnIsInFqCpName object has the same value as the corresponding appnIsInFqCpName object, then the entries indexed by these objects are referring to the same session."

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

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

-- Conformance Statement
-- **************************************************************
ebnConformance OBJECT IDENTIFIER ::= { ebnMIB 2 }
ebnCompliances OBJECT IDENTIFIER ::= { ebnConformance 1 }
ebnGroups OBJECT IDENTIFIER ::= { ebnConformance 2 }

-- Compliance statements
ebnCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
"The compliance statement for the SNMPv2 entities which implement the ebnMIB."

MODULE -- this module

-- Unconditionally mandatory groups
MANDATORY-GROUPS {
  ebnDirectoryGroup,
  ebnIsRscvGroup,
  ebnDirectoryConfigGroup,
  ebnCosMappingGroup,
  ebnSubnetRoutingListGroup }

-- Conditionally mandatory groups
GROUP hbnIsInGroup
DESCRIPTION
"The hbnIsInGroup is mandatory only for HPR extended border nodes."
::= {ebnCompliances 1 }

-- Group definitions
ebnDirectoryGroup OBJECT-GROUP
  OBJECTS { ebnDirSubnetAffiliation }
  STATUS current
  DESCRIPTION
  "The EBN-related directory objects."
  ::= { ebngroups 1 }

ebnIsRscvGroup OBJECT-GROUP
  OBJECTS { ebnIsRscvDestinationRoute, ebnIsRscvDestinationCos }
  STATUS current
  DESCRIPTION
  "Two objects representing RSCV and class of service information saved by an EBN."
  ::= { ebngroups 2 }

ebnDirectoryConfigGroup OBJECT-GROUP
  OBJECTS { ebnSearchCacheTime, ebnMaxSearchCache, ebnDefaultSubnetVisitCount }
  STATUS current
DESCRIPTION
"The EBN Directory Configuration Group."

::= { ebnGroups 3 }

ebnCosMappingGroup OBJECT-GROUP
OBJECTS { ebnCosMapNativeCos }
STATUS current
DESCRIPTION
"The EBN COS Mapping Group."

::= { ebnGroups 4 }

ebnSubnetRoutingListGroup OBJECT-GROUP
OBJECTS { ebnSubnetSearchDynamics,
          ebnSubnetSearchOrdering,
          ebnSearchCpName,
          ebnSearchSNVC }
STATUS current
DESCRIPTION
"The Subnet Routing List Group."

::= { ebnGroups 5 }

hbnIsInGroup OBJECT-GROUP
OBJECTS { hbnIsInRtpNceId, hbnIsInRtpTcid }
STATUS current
DESCRIPTION
"The HBN-related Intermediate Session Objects."

::= { ebnGroups 6 }

END

5.0 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 [10]. A protocol for access control is defined in [11].

None of the read-only objects in the EBN 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.

There are no read-write objects in the EBN MIB.

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8.0 References


[16] IBM, SNA/MS Formats, GC31-8302-01
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