

Definitions of Managed Objects for  
the NBMA Next Hop Resolution Protocol (NHRP)

May 1999

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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 describes managed objects for the Next Hop Resolution Protocol (NHRP) as defined in [RFC 2332](#).

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## 1. Introduction

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects for the Next Hop Resolution Protocol (NHRP) as defined in [RFC 2332](#) [17].

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](#) [21].

## 2. The SNMP Management Framework

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in [RFC 2571](#) [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 [RFC 1155](#) [2], [RFC 1212](#) [3] and [RFC 1215](#) [4]. The second version, called SMIV2, is described in [RFC 2578](#) [5], [RFC 2579](#) [6] and [RFC 2580](#) [7].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in [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 2572](#) [11] and [RFC 2574](#) [12].

- o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in [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 2573](#) [14] and the view-based access control mechanism described in [RFC 2575](#) [15].

A more detailed introduction to the current SNMP Management Framework can be found in [RFC 2570](#) [16].

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.

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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.](#) Structure of the MIB

The NHRP MIB contains three groups: the General Group, the Client Group, and the Server Group.

#### [3.1.](#) The NHRP General Group

The General Group contains objects that apply to both clients and servers -- in particular the `nhrpNextIndex` scalar object, the NHRP Cache Table and the NHRP Purge Request Table.

The `nhrpNextIndex` scalar object is used to provide unique indices for the `nhrpClientIndex` in the `nhrpClientTable` and the `nhrpServerIndex` in the `nhrpServerTable`. If used consistently, this object may prevent

conflicts when multiple managers attempt to create rows simultaneously in the same table.

#### 3.1.1. The NHRP Cache Table

The NHRP Cache Table represents the internetwork layer address to NBMA address cache that is maintained by both NHRP clients and NHRP servers.

The NHRP Cache Table contains an ifIndex as part of the Index Clause. This ifIndex represents the use of a generic ifIndex, such that the value of this ifIndex SHOULD reflect a specific NBMA subnetwork related interface as determined by an implementation. For example, assuming that the NBMA subnetwork is ATM, then it is up to the implementors of this MIB to determine their own ATM interface layering (assuming compliance with the IF-MIB, [RFC 2233](#) [18] and the ATM-MIB, [RFC 2515](#) [19]). In other words, assuming that the NBMA subnetwork is ATM, the ifIndex in the NHRP Cache Table would represent the ifIndex containing or consisting of the VC (or shortcut) denoted by this Table entry.

The indexing scheme for the NHRP Cache Table is very similar to the MPC Ingress Cache Table and the MPS Ingress Cache Table in the

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Multiprotocol Over ATM (MPOA) MIB [23]. This MIB and the MPOA MIB were designed to be complementary and non-overlapping. The MPOA MIB should also support this MIB. The MPOA MIB was designed prior to this MIB, and was designed by the LANE/MPOA Working Group in the ATM FORUM. The indexing scheme of the NHRP Cache Table (and the NHRP Server Cache Table) reflect the indexing scheme of the MPC Ingress Cache Table and the MPS Ingress Cache Table. Although, other indexing schemes could have been used for the NHRP Cache Table, a consistent indexing scheme between these tables was thought to be more advantageous from an implementation standpoint.

#### 3.1.2. The NHRP Purge Request Table

The NHRP Purge Request Table is a way to track Purge Request Information.

## [3.2.](#) The NHRP Client Group

The Client Group contains objects that only apply to NHRP clients (NHCs).

### [3.2.1.](#) The NHRP Client Table

The NHRP Client Table contains entries for NHRP Next Hop Clients (NHCs) associated with this agent. Each row in the table represents a single NHC. The RequestID used in Registration requests needs to be saved to non-volatile storage. Depending upon the implementation, this may or may not impact how the StorageType is used. For a complete description of how the Registration RequestID is used, see Section 5.2.3 of [[17](#)].

### [3.2.2.](#) The NHRP Client Registration Table

The NHRP Client Registration Table contains information on registration requests which need to be maintained by the Clients. Each entry in this table represents a single registration request. Note: since the NHRP specification does not mandate a refresh algorithm, this table omits refresh information, however, this table does contain information for all the registration requests which need to be maintained by the NHRP Clients.

### [3.2.3.](#) The NHRP Client NHS Table

The NHRP Client NHS Table contains the NBMA subnetwork addresses of servers configured for use by the client. By default, the agent will

add an entry to this table which corresponds to the client's default router.

### [3.2.4.](#) The NHRP Client Statistics Table

The NHRP Client Statistics Table contains NHRP statistics maintained by a client. These statistics include counters on requests and replies, as well as counters for errors which are encountered by the Clients.

### [3.3.](#) The NHRP Server Group

The Server Group contains objects that only apply to NHRP servers (NHSEs).

#### [3.3.1.](#) The NHRP Server Table

The NHRP Server Table contains entries for each server associated with this agent.

#### [3.3.2.](#) The NHRP Server Cache Table

The NHRP Server Cache Table contains additional objects that a server keeps for each entry in its cache. This table extends the NHRP Cache Table defined in the General Group.

#### [3.3.3.](#) The NHRP Server NHC Table

This table contains information about all the Clients known to the Servers.

#### [3.3.4.](#) The NHRP Server Statistics Table

The NHRP Server Statistics Table contains NHRP statistics maintained by a server. These statistics include counters on requests and replies, as well as counters for errors which are encountered by the Servers.

## [4.](#) NBMA Next Hop Resolution Protocol MIB Definitions

NHRP-MIB DEFINITIONS ::= BEGIN

IMPORTS

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OBJECT-TYPE, MODULE-IDENTITY, mib-2, Integer32,  
Counter32, Unsigned32

```

        FROM SNMPv2-SMI
MODULE-COMPLIANCE, OBJECT-GROUP
        FROM SNMPv2-CONF
TEXTUAL-CONVENTION, TruthValue, RowStatus, StorageType,
TimeStamp
        FROM SNMPv2-TC
ifIndex
        FROM IF-MIB
AddressFamilyNumbers
        FROM IANA-ADDRESS-FAMILY-NUMBERS-MIB
;

nhrpMIB MODULE-IDENTITY
    LAST-UPDATED "9905191200Z" -- May 19, 1999
    ORGANIZATION "Internetworking Over NBMA (ion) Working Group"
    CONTACT-INFO
        "Maria Greene (maria@xedia.com)
        Contractor

        Joan Cucchiara (joan@ironbridgenetworks.com)
        IronBridge Networks

        James V. Luciani (luciani@baynetworks.com)
        Bay Networks"
    DESCRIPTION
        "This MIB contains managed object definitions for the Next
        Hop Resolution Procol, NHRP, as defined in RFC 2332 [17]."

-- revision history

REVISION      "9905191200Z" -- May 19, 1999
                                -- RFC-Editor assigns RFC xxxx
DESCRIPTION   "Initial version, published as RFC xxxx."

 ::= { mib-2 XXX }              -- to be assigned by IANA

--*****
-- NHRP Textual Conventions
--*****

NhrpGenAddr ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "The value of an internetwork layer or NBMA address."
    SYNTAX      OCTET STRING (SIZE (0..64))

nhrpObjects OBJECT IDENTIFIER ::= { nhrpMIB 1 }

```



```
--*****
-- NHRP General (Client and Server) Objects
--*****
```

```
nhrpGeneralObjects OBJECT IDENTIFIER ::= { nhrpObjects 1 }
```

```
--
-- The following scalar is to be used to
-- provided indices for the
-- nhrpClientTable, and/or the nhrpServerTable.
--
```

```
nhrpNextIndex    OBJECT-TYPE
    SYNTAX        Unsigned32
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
```

```
    "This scalar is used for creating rows in the
    nhrpClientTable and the nhrpServerTable.
    The value of this variable is a currently unused value
    for nhrpClientIndex and nhrpServerIndex.
```

```
    The value returned when reading this variable must be
    unique for the NHC's and NHS's indices associated with
    this row. Subsequent attempts to read this variable
    must return different values.
```

```
    NOTE:  this object exists in the General Group because
    it is to be used in establishing rows in the
    nhrpClientTable and the nhrpServerTable.  In other words,
    the value retrieved from this object could become the
    value of nhrpClientIndex and nhprServerIndex.
```

```
    In the situation of an agent re-initialization the value
    of this object must be saved in non-volatile storage.
```

```
    This variable will return the special value 0 if no new
    rows can be created."
```

```
::= { nhrpGeneralObjects 1 }
```

```
--
-- The NHRP Cache Table
--
```

```

nhrpCacheTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF NhrpCacheEntry
    MAX-ACCESS  not-accessible
    STATUS      current

```

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#### DESCRIPTION

"This table contains mappings between internetwork layer addresses and NBMA subnetwork layer addresses."

```
 ::= { nhrpGeneralObjects 2 }
```

```

nhrpCacheEntry OBJECT-TYPE
    SYNTAX      NhrpCacheEntry
    MAX-ACCESS  not-accessible
    STATUS      current

```

#### DESCRIPTION

"A cached mapping between an internetwork layer address and an NBMA address. Entries can be created by the network administrator using the nhrpCacheRowStatus column, or they may be added dynamically based on protocol operation (including NHRP, SCSP, and others, such as ATMARP).

When created based by NHRP protocol operations this entry is largely based on contents contained in the Client Information Entry (CIE).

Zero or more Client Information Entries (CIEs) may be included in the NHRP Packet. For a complete description of the CIE, refer to [Section 5.2.0.1 of RFC 2332 \[17\]](#)."

```

INDEX      {
            nhrpCacheInternetworkAddrType,
            nhrpCacheInternetworkAddr,
            ifIndex,
            nhrpCacheIndex
        }
 ::= { nhrpCacheTable 1 }
```

```

NhrpCacheEntry ::= SEQUENCE {
    nhrpCacheInternetworkAddrType  AddressFamilyNumbers,
    nhrpCacheInternetworkAddr      NhrpGenAddr,
    nhrpCacheIndex                  Unsigned32,
    nhrpCachePrefixLength           Integer32,

```

nhrpCacheNextHopInternetworkAddr	NhrpGenAddr,
nhrpCacheNbmaAddrType	AddressFamilyNumbers,
nhrpCacheNbmaAddr	NhrpGenAddr,
nhrpCacheNbmaSubaddr	NhrpGenAddr,
nhrpCacheType	INTEGER,
nhrpCacheState	INTEGER,
nhrpCacheHoldingTimeValid	TruthValue,
nhrpCacheHoldingTime	Unsigned32,
nhrpCacheNegotiatedMtu	Integer32,
nhrpCachePreference	Integer32,
nhrpCacheStorageType	StorageType,
nhrpCacheRowStatus	RowStatus

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}

nhrpCacheInternetworkAddrType OBJECT-TYPE

SYNTAX AddressFamilyNumbers

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The internetwork layer address type of this Next Hop Resolution Cache entry. The value of this object indicates how to interpret the values of nhrpCacheInternetworkAddr and nhrpCacheNextHopInternetworkAddr."

::= { nhrpCacheEntry 1 }

nhrpCacheInternetworkAddr OBJECT-TYPE

SYNTAX NhrpGenAddr

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The value of the internetwork address of the destination."

::= { nhrpCacheEntry 2 }

nhrpCacheIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..4294967295)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An identifier for this entry that has local significance within the scope of the General Group. This identifier is used here to

uniquely identify this row, and also used  
in the 'nhrpPurgeTable' for the value of  
the 'nhrpPurgeCacheIdentifier'."  
::= { nhrpCacheEntry 3 }

nhrpCachePrefixLength OBJECT-TYPE

SYNTAX Integer32 (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of bits that define the internetwork layer  
prefix associated with the nhrpCacheInternetworkAddr."

::= { nhrpCacheEntry 4 }

nhrpCacheNextHopInternetworkAddr OBJECT-TYPE

SYNTAX NhrpGenAddr

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value of the internetwork address of the next hop."

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::= { nhrpCacheEntry 5 }

nhrpCacheNbmaAddrType OBJECT-TYPE

SYNTAX AddressFamilyNumbers

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The NBMA address type. The value of this  
object indicates how to interpret  
the values of nhrpCacheNbmaAddr and  
nhpCacheNbmaSubaddr."

::= { nhrpCacheEntry 6 }

nhrpCacheNbmaAddr OBJECT-TYPE

SYNTAX NhrpGenAddr

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value of the NBMA subnetwork address of the next  
hop."

::= { nhrpCacheEntry 7 }

nhrpCacheNbmaSubaddr OBJECT-TYPE

SYNTAX NhrpGenAddr

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value of the NBMA subaddress of the next hop. If there is no subaddress concept for the NBMA address family, this value will be a zero-length OCTET STRING."

::= { nhrpCacheEntry 8 }

nhrpCacheType OBJECT-TYPE

SYNTAX INTEGER {

other(1),

register(2),

resolveAuthoritative(3),

resoveNonauthoritative(4),

transit(5),

administrativelyAdded(6),

atmarp(7),

scsp(8)

}

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"An indication of how this cache entry was created. The values are:

'other(1)'

The entry was added by some

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other means.

'register(2)'

In a server, added based on a client registration.

'resolveAuthoritative(3)'

In a client, added based on receiving an Authoritative NHRP Resolution Reply.

'resolveNonauthoritative(4)'

In a client, added based on receiving a Nonauthoritative NHRP Resolution Reply.

'transit(5)'

In a transit server, added by

examining a forwarded NHRP packet.

'administrativelyAdded(6)' In a client or server, manually added by the administrator. The StorageType of this entry is reflected in 'nhrpCacheStorageType'.

'atmarp(7)' The entry was added due to an ATMARP.

'scsp(8)' The entry was added due to SCSP.

When the entry is under creation using the nhrpCacheRowStatus column, the only value that can be specified by the administrator is 'administrativelyAdded'. Attempting to set any other value will cause an 'inconsistentValue' error.

The value cannot be modified once the entry is active."  
 ::= { nhrpCacheEntry 9 }

nhrpCacheState	OBJECT-TYPE
SYNTAX	INTEGER { incomplete(1), ackReply(2), nakReply(3) }
MAX-ACCESS	read-only
STATUS	current
DESCRIPTION	

"An indication of the state of this entry. The values are:

'incomplete(1)' The client has sent a NHRP Resolution Request but has not yet received the NHRP Resolution Reply.

'ackReply(2)' For a client or server, this is a  
cached valid mapping.

'nakReply(3)' For a client or server, this is a  
cached NAK mapping."

::= { nhrpCacheEntry 10 }

nhrpCacheHoldingTimeValid OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"True(1) is returned if the value of  
'nhrpCacheType' is not  
'administrativelyAdded'. Since the  
value of 'nhrpCacheType' was not  
configured by a user, the value of  
'nhrpCacheHoldingTime' is  
considered valid. In other words, the value of  
'nhrpCacheHoldingTime' represents  
the Holding Time for the cache Entry.

If 'nhrpCacheType' has been configured by a  
user, (i.e. the value of 'nhrpCacheType' is  
'administrativelyAdded') then false(2) will be returned.  
This indicates that the value of  
'nhrpCacheHoldingTime' is undefined because this row  
could possibly be backed up in nonvolatile storage."

::= { nhrpCacheEntry 11 }

nhrpCacheHoldingTime OBJECT-TYPE

SYNTAX Unsigned32(0..65535)

UNITS "seconds"

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"If the value of 'nhrpCacheHoldingTimeValid' is  
true(1) then this object represents the number  
of seconds that the cache entry will remain in this  
table. When this value reaches 0 (zero) the row should  
be deleted.

If the value of 'nhrpCacheHoldingTimeValid' is  
false(2) then this object is undefined."

::= { nhrpCacheEntry 12 }

nhrpCacheNegotiatedMtu OBJECT-TYPE

SYNTAX Integer32 (0..65535)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum transmission unit (MTU) that was negotiated or registered for this entity. In other words, this is the actual MTU being used."

::= { nhrpCacheEntry 13 }

nhrpCachePreference OBJECT-TYPE

SYNTAX Integer32 (0..255)

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"An object which reflects the Preference value of the Client Information Entry (CIE).

Zero or more Client Information Entries (CIEs) may be included in the NHRP Packet. One of the fields in the CIE is the Preference. For a complete description of the CIE, refer to [Section 5.2.0.1 of RFC 2332](#) [17]."

REFERENCE

"[Section 5.2.0.1](#) Mandatory Part Format, [RFC 2332](#) [17]."

::= { nhrpCacheEntry 14 }

nhrpCacheStorageType OBJECT-TYPE

SYNTAX StorageType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This value only has meaning when the 'nhrpCacheType' has the value of 'administrativelyAdded'.

When the row is created due to being 'administrativelyAdded', this object reflects whether this row is kept in volatile storage and lost upon reboot or if this row is backed up by non-volatile or permanent storage.

If the value of 'nhrpCacheType' has a value which is not 'administrativelyAdded', then the value of this object is 'other(1)'."

DEFVAL { nonVolatile }

::= { nhrpCacheEntry 15 }

nhrpCacheRowStatus OBJECT-TYPE



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```
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "An object that allows entries in this table to be
    created and deleted using the RowStatus convention."
 ::= { nhrpCacheEntry 16 }
```

```
--
-- The NHRP Purge Request Table
--
```

```
nhrpPurgeReqTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF NhrpPurgeReqEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table will track Purge Request Information."
    ::= { nhrpGeneralObjects 3 }
```

```
nhrpPurgeReqEntry OBJECT-TYPE
    SYNTAX      NhrpPurgeReqEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Information regarding a Purge Request."
    INDEX       { nhrpPurgeIndex }
    ::= { nhrpPurgeReqTable 1 }
```

```
NhrpPurgeReqEntry ::= SEQUENCE {
    nhrpPurgeIndex                Unsigned32,
    nhrpPurgeCacheIdentifier      Unsigned32,
    nhrpPurgePrefixLength        Integer32,
    nhrpPurgeRequestID           Unsigned32,
    nhrpPurgeReplyExpected       TruthValue,
    nhrpPurgeRowStatus            RowStatus
}
```

```
nhrpPurgeIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
```

DESCRIPTION

"An index for this entry that has local significance within the scope of this table."

::= { nhrpPurgeReqEntry 1 }

nhrpPurgeCacheIdentifier OBJECT-TYPE

SYNTAX Unsigned32 (1..4294967295)

MAX-ACCESS read-create

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DESCRIPTION

"This object identifies which row in 'nhrpCacheTable' is being purged. This object should have the same value as the 'nhrpCacheIndex' in the 'nhrpCacheTable'."

::= { nhrpPurgeReqEntry 2 }

nhrpPurgePrefixLength OBJECT-TYPE

SYNTAX Integer32 (0..255)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"In the case of NHRP Purge Requests, this specifies the equivalence class of addresses which match the first 'Prefix Length' bit positions of the Client Protocol Address specified in the Client Information Entry (CIE)."

::= { nhrpPurgeReqEntry 3 }

nhrpPurgeRequestID OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The Request ID used in the purge request."

::= { nhrpPurgeReqEntry 4 }

nhrpPurgeReplyExpected OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"An indication of whether this Purge Request has the 'N' Bit cleared (off)."

```

 ::= { nhrpPurgeReqEntry 5 }

nhrpPurgeRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "An object that allows entries in this table to be
         created and deleted using the RowStatus convention."
    ::= { nhrpPurgeReqEntry 6 }

--*****
-- NHRP Client Objects
--*****

nhrpClientObjects OBJECT IDENTIFIER ::= { nhrpObjects 2 }

```

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```

--
-- The NHRP Client Table
--

nhrpClientTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF NhrpClientEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Information about NHRP clients (NHCs) managed by this
         agent."
    ::= { nhrpClientObjects 1 }

nhrpClientEntry OBJECT-TYPE
    SYNTAX      NhrpClientEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Information about a single NHC."
    INDEX       { nhrpClientIndex }
    ::= { nhrpClientTable 1 }

NhrpClientEntry ::= SEQUENCE {
    nhrpClientIndex                Unsigned32,
    nhrpClientInternetNetworkAddrType  AddressFamilyNumbers,

```

nhrpClientInternetworkAddr	NhrpGenAddr,
nhrpClientNbmaAddrType	AddressFamilyNumbers,
nhrpClientNbmaAddr	NhrpGenAddr,
nhrpClientNbmaSubaddr	NhrpGenAddr,
nhrpClientInitialRequestTimeout	Integer32,
nhrpClientRegistrationRequestRetries	Integer32,
nhrpClientResolutionRequestRetries	Integer32,
nhrpClientPurgeRequestRetries	Integer32,
nhrpClientDefaultMtu	Unsigned32,
nhrpClientHoldTime	Unsigned32,
nhrpClientRequestID	Unsigned32,
nhrpClientStorageType	StorageType,
nhrpClientRowStatus	RowStatus

}

nhrpClientIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..4294967295)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An identifier for the NHRP client that is unique within the scope of this agent. The 'nhrpNextIndex' value should be consulted (read), prior to creating a row in this table, and the value returned from reading 'nhrpNextIndex' should be used as this object's value."

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::= { nhrpClientEntry 1 }

nhrpClientInternetworkAddrType OBJECT-TYPE

SYNTAX AddressFamilyNumbers

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The type of the internetwork layer address of this client. This object indicates how the value of nhrpClientInternetworkAddr is to be interpreted."

::= { nhrpClientEntry 2 }

nhrpClientInternetworkAddr OBJECT-TYPE

SYNTAX NhrpGenAddr

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value of the internetwork layer address of this client."  
 ::= { nhrpClientEntry 3 }

nhrpClientNbmaAddrType OBJECT-TYPE

SYNTAX AddressFamilyNumbers

MAX-ACCESS read-create

STATUS current

DESCRIPTION

    "The type of the NBMA subnetwork address of this client. This object indicates how the values of nhrpClientNbmaAddr and nhrpClientNbmaSubaddr are to be interpreted."

::= { nhrpClientEntry 4 }

nhrpClientNbmaAddr OBJECT-TYPE

SYNTAX NhrpGenAddr

MAX-ACCESS read-create

STATUS current

DESCRIPTION

    "The NBMA subnetwork address of this client."

::= { nhrpClientEntry 5 }

nhrpClientNbmaSubaddr OBJECT-TYPE

SYNTAX NhrpGenAddr

MAX-ACCESS read-create

STATUS current

DESCRIPTION

    "The NBMA subaddress of this client. For NBMA address families without a subaddress concept, this will be a zero-length OCTET STRING."

::= { nhrpClientEntry 6 }

nhrpClientInitialRequestTimeout OBJECT-TYPE

SYNTAX Integer32 (1..900)

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

    "The number of seconds that the client will wait before timing out an NHRP initial request. This object only has meaning for the initial timeout period."

```

DEFVAL      { 10 }
::= { nhrpClientEntry 7 }

nhrpClientRegistrationRequestRetries OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The number of times the client will retry the
        registration request before failure. A value of
        0 means don't retry. A value of 65535 means
        retry forever."
    DEFVAL      { 3 }
    ::= { nhrpClientEntry 8 }

nhrpClientResolutionRequestRetries OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The number of times the client will retry the resolution
        request before failure. A value of 0 means don't retry.
        A value of 65535 means retry forever."
    DEFVAL      { 3 }
    ::= { nhrpClientEntry 9 }

nhrpClientPurgeRequestRetries OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The number of times the client will retry a purge request
        before failure. A value of 0 means don't retry. A value of
        65535 means retry forever."
    DEFVAL      { 3 }
    ::= { nhrpClientEntry 10 }

nhrpClientDefaultMtu OBJECT-TYPE
    SYNTAX      Unsigned32 (0..65535)
    MAX-ACCESS  read-create
    STATUS      current

```

"The default maximum transmission unit (MTU) of the LIS/LAG which this client should use. This object will be initialized by the agent to the default MTU of the LIS/LAG (which is 9180) unless a different MTU value is specified during creation of this Client."

REFERENCE

"[RFC 2225](#) [25], Classical IP and ARP over ATM, [Section 7](#), DEFAULT VALUE FOR IP MTU OVER ATM AAL5."

DEFVAL { 9180 }

::= { nhrpClientEntry 11 }

nhrpClientHoldTime OBJECT-TYPE

SYNTAX Unsigned32(0..65535)

UNITS "seconds"

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The hold time the client will register."

DEFVAL { 900 }

::= { nhrpClientEntry 12 }

nhrpClientRequestID OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The Request ID used to register this client with its server. According to [Section 5.2.3](#) of the NHRP Specification, [RFC 2332](#) [17], the Request ID must be kept in non-volatile storage, so that if an NHC crashes and re-initializes, it will use a different Request ID during the registration process when reregistering with the same NHS."

REFERENCE

"[Section 5.2.3](#) NHRP Registration Request, [RFC 2332](#) [17]."

::= { nhrpClientEntry 13 }

nhrpClientStorageType OBJECT-TYPE

SYNTAX StorageType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object defines whether this row is kept in volatile storage and lost upon a Client crash or reboot situation, or if this row is backed up by nonvolatile or permanent storage."

DEFVAL { nonVolatile }

::= { nhrpClientEntry 14 }

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nhrpClientRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"An object that allows entries in this table to be created and deleted using the RowStatus convention."

::= { nhrpClientEntry 15 }

--

-- The NHRP Client Registration Table

--

nhrpClientRegistrationTable OBJECT-TYPE

SYNTAX SEQUENCE OF NhrpClientRegistrationEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table of Registration Request Information that needs to be maintained by the NHCs (clients)."

REFERENCE

"[Section 5.2.3](#) NHRP Registration Request, [RFC 2332](#) [[17](#)]."

::= { nhrpClientObjects 2 }

nhrpClientRegistrationEntry OBJECT-TYPE

SYNTAX NhrpClientRegistrationEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An NHC needs to maintain registration request information between the NHC and the NHS. An entry in this table represents information for a single registration request."

INDEX { nhrpClientIndex,  
nhrpClientRegIndex  
}

::= { nhrpClientRegistrationTable 1 }

NhrpClientRegistrationEntry ::= SEQUENCE {  
nhrpClientRegIndex Unsigned32,  
nhrpClientRegUniqueness INTEGER,  
nhrpClientRegState INTEGER,  
nhrpClientRegRowStatus RowStatus





	'nakRegisterReply'.
'registering(2)'	A registration request has been issued and a registration reply is expected.
'ackRegisterReply(3)'	A positive registration reply has been received.
'nakRegisterReply(4)'	The client has received a negative registration reply (NAK)."
::= { nhrpClientRegistrationEntry 3 }	

nhrpClientRegRowStatus OBJECT-TYPE

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```

SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "An object that allows entries in this table to be
    created and deleted using the RowStatus convention."
::= { nhrpClientRegistrationEntry 4 }
```

```

--
-- The NHRP Client->Server Table
--
```

```

nhrpClientNhsTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF NhrpClientNhsEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of NHSes that are available for use by this NHC
        (client). By default, the agent will add an entry to this
        table that corresponds to the client's default router."
    ::= { nhrpClientObjects 3 }
```

```

nhrpClientNhsEntry OBJECT-TYPE
    SYNTAX      NhrpClientNhsEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
```

"An NHS that may be used by an NHC."  
INDEX { nhrpClientIndex, nhrpClientNhsIndex }  
::= { nhrpClientNhsTable 1 }

NhrpClientNhsEntry ::= SEQUENCE {  
nhrpClientNhsIndex Unsigned32,  
nhrpClientNhsInternetworkAddrType AddressFamilyNumbers,  
nhrpClientNhsInternetworkAddr NhrpGenAddr,  
nhrpClientNhsNbmaAddrType AddressFamilyNumbers,  
nhrpClientNhsNbmaAddr NhrpGenAddr,  
nhrpClientNhsNbmaSubaddr NhrpGenAddr,  
nhrpClientNhsInUse TruthValue,  
nhrpClientNhsRowStatus RowStatus  
}

nhrpClientNhsIndex OBJECT-TYPE  
SYNTAX Unsigned32 (1..4294967295)  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION  
"An identifier for an NHS available to an NHC."  
::= { nhrpClientNhsEntry 1 }

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nhrpClientNhsInternetworkAddrType OBJECT-TYPE  
SYNTAX AddressFamilyNumbers  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"The type of the internetwork layer address of the  
NHRP server represented in this entry. This object  
indicates how the value of  
nhrpClientNhsInternetworkAddr is to be interpreted."  
::= { nhrpClientNhsEntry 2 }

nhrpClientNhsInternetworkAddr OBJECT-TYPE  
SYNTAX NhrpGenAddr  
MAX-ACCESS read-create  
STATUS current  
DESCRIPTION  
"The value of the destination internetwork layer  
address of the NHRP server represented by this  
entry. If this value is not known, this will be

a zero-length OCTET STRING."  
 ::= { nhrpClientNhsEntry 3 }

nhrpClientNhsNbmaAddrType OBJECT-TYPE

SYNTAX          AddressFamilyNumbers

MAX-ACCESS     read-create

STATUS          current

DESCRIPTION

        "The type of the NBMA subnetwork address of the NHRP  
        Server represented by this entry. This object indicates  
        how the values of nhrpClientNhsNbmaAddr and  
        nhrpClientNhsNbmaSubaddr are to be interpreted."

::= { nhrpClientNhsEntry 4 }

nhrpClientNhsNbmaAddr OBJECT-TYPE

SYNTAX          NhrpGenAddr

MAX-ACCESS     read-create

STATUS          current

DESCRIPTION

        "The NBMA subnetwork address of the NHS. The type of  
        the address is indicated by the corresponding value of  
        nhrpClientNhsNbmaAddrType."

::= { nhrpClientNhsEntry 5 }

nhrpClientNhsNbmaSubaddr OBJECT-TYPE

SYNTAX          NhrpGenAddr

MAX-ACCESS     read-create

STATUS          current

DESCRIPTION

        "The NBMA subaddress of the NHS. For NMBA address  
        families that do not have the concept of subaddress,

        this will be a zero-length OCTET STRING."  
 ::= { nhrpClientNhsEntry 6 }

nhrpClientNhsInUse OBJECT-TYPE

SYNTAX          TruthValue

MAX-ACCESS     read-only

STATUS          current

DESCRIPTION

        "An indication of whether this NHS is in use by the NHC."

::= { nhrpClientNhsEntry 7 }

```

nhrpClientNhsRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "An object that allows entries in this table to be
        created and deleted using the RowStatus convention."
    ::= { nhrpClientNhsEntry 8 }

--
-- The NHRP Client StatisticsTable
--

nhrpClientStatTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF NhrpClientStatEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table contains statistics collected by NHRP
        clients."
    ::= { nhrpClientObjects 4 }

nhrpClientStatEntry OBJECT-TYPE
    SYNTAX      NhrpClientStatEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Statistics collected by a NHRP client."
    INDEX      { nhrpClientIndex }
    ::= { nhrpClientStatTable 1 }

NhrpClientStatEntry ::= SEQUENCE {
    nhrpClientStatTxResolveReq          Counter32,
    nhrpClientStatRxResolveReplyAck     Counter32,
    nhrpClientStatRxResolveReplyNakProhibited Counter32,
    nhrpClientStatRxResolveReplyNakInsufResources Counter32,
    nhrpClientStatRxResolveReplyNakNoBinding Counter32,
    nhrpClientStatRxResolveReplyNakNotUnique Counter32,

```

```

    nhrpClientStatTxRegisterReq          Counter32,
    nhrpClientStatRxRegisterAck          Counter32,
    nhrpClientStatRxRegisterNakProhibited Counter32,

```

nhrpClientStatRxRegisterNakInsufResources	Counter32,
nhrpClientStatRxRegisterNakAlreadyReg	Counter32,
nhrpClientStatRxPurgeReq	Counter32,
nhrpClientStatTxPurgeReq	Counter32,
nhrpClientStatRxPurgeReply	Counter32,
nhrpClientStatTxPurgeReply	Counter32,
nhrpClientStatTxErrorIndication	Counter32,
nhrpClientStatRxErrUnrecognizedExtension	Counter32,
nhrpClientStatRxErrLoopDetected	Counter32,
nhrpClientStatRxErrProtoAddrUnreachable	Counter32,
nhrpClientStatRxErrProtoError	Counter32,
nhrpClientStatRxErrSduSizeExceeded	Counter32,
nhrpClientStatRxErrInvalidExtension	Counter32,
nhrpClientStatRxErrAuthenticationFailure	Counter32,
nhrpClientStatRxErrHopCountExceeded	Counter32,
nhrpClientStatDiscontinuityTime	TimeStamp

}

nhrpClientStatTxResolveReq OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Resolution Requests transmitted by this client.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

::= { nhrpClientStatEntry 1 }

nhrpClientStatRxResolveReplyAck OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of positively acknowledged NHRP Resolution Replies received by this client.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of

```
    nhrpClientStatDiscontinuityTime."  
 ::= { nhrpClientStatEntry 2 }
```

nhrpClientStatRxResolveReplyNakProhibited OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Resolution Replies received by this client that contained the code indicating 'Administratively Prohibited'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

```
 ::= { nhrpClientStatEntry 3 }
```

nhrpClientStatRxResolveReplyNakInsufResources OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Resolution Replies received by this client that contained the code indicating 'Insufficient Resources'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

```
 ::= { nhrpClientStatEntry 4 }
```

nhrpClientStatRxResolveReplyNakNoBinding OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Resolution Replies received by this client that contained the code indicating 'No Internetworking Layer Address to NBMA Address Binding Exists'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at

NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

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::= { nhrpClientStatEntry 5 }

nhrpClientStatRxResolveReplyNakNotUnique OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Resolution Replies received by this client that contained the code indicating 'Binding Exists But Is Not Unique'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

::= { nhrpClientStatEntry 6 }

nhrpClientStatTxRegisterReq OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Registration Requests transmitted by this client.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

::= { nhrpClientStatEntry 7 }

nhrpClientStatRxRegisterAck OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of positively acknowledged NHRP Registration



Replies received by this client.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

::= { nhrpClientStatEntry 8 }

nhrpClientStatRxRegisterNakProhibited OBJECT-TYPE

SYNTAX Counter32

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MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Registration Replies received by this client that contained the code indicating 'Administratively Prohibited'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

::= { nhrpClientStatEntry 9 }

nhrpClientStatRxRegisterNakInsufResources OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Registration Replies received by this client that contained the code indicating 'Insufficient Resources'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

::= { nhrpClientStatEntry 10 }

nhrpClientStatRxRegisterNakAlreadyReg OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"The number of NAKed NHRP Registration Replies received by this client that contained the code indicating 'Unique Internetworking Layer Address Already Registered'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

::= { nhrpClientStatEntry 11 }

nhrpClientStatRxPurgeReq OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current

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DESCRIPTION

"The number of NHRP Purge Requests received by this client.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

::= { nhrpClientStatEntry 12 }

nhrpClientStatTxPurgeReq OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current

DESCRIPTION

"The number of NHRP Purge Requests transmitted by this client.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of

```
    nhrpClientStatDiscontinuityTime."  
 ::= { nhrpClientStatEntry 13 }
```

nhrpClientStatRxPurgeReply OBJECT-TYPE

```
SYNTAX      Counter32  
MAX-ACCESS  read-only  
STATUS      current  
DESCRIPTION  
    "The number of NHRP Purge Replies received by this  
    client.
```

Discontinuities in the value of this counter can occur  
at re-initialization of the management system, at  
NHRP Client re-initialization and at  
other times as indicated by the value of  
nhrpClientStatDiscontinuityTime."

```
 ::= { nhrpClientStatEntry 14 }
```

nhrpClientStatTxPurgeReply OBJECT-TYPE

```
SYNTAX      Counter32  
MAX-ACCESS  read-only  
STATUS      current  
DESCRIPTION  
    "The number of NHRP Purge Replies transmitted by this  
    client.
```

Discontinuities in the value of this counter can occur

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```
    at re-initialization of the management system, at  
    NHRP Client re-initialization and at  
    other times as indicated by the value of  
    nhrpClientStatDiscontinuityTime."  
 ::= { nhrpClientStatEntry 15 }
```

nhrpClientStatTxErrorIndication OBJECT-TYPE

```
SYNTAX      Counter32  
MAX-ACCESS  read-only  
STATUS      current  
DESCRIPTION  
    "The number of NHRP Error Indication packets transmitted  
    by this client.
```

Discontinuities in the value of this counter can occur

at re-initialization of the management system, at  
NHRP Client re-initialization and at  
other times as indicated by the value of  
nhrpClientStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."

::= { nhrpClientStatEntry 16 }

nhrpClientStatRxErrUnrecognizedExtension OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received  
by this client with the error code  
'Unrecognized Extension'.

Discontinuities in the value of this counter can occur  
at re-initialization of the management system, at  
NHRP Client re-initialization and at  
other times as indicated by the value of  
nhrpClientStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."

::= { nhrpClientStatEntry 17 }

nhrpClientStatRxErrLoopDetected OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received  
by this client with the error code 'NHRP Loop Detected'.

Discontinuities in the value of this counter can occur

at re-initialization of the management system, at  
NHRP Client re-initialization and at  
other times as indicated by the value of  
nhrpClientStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."

::= { nhrpClientStatEntry 18 }

nhrpClientStatRxErrProtoAddrUnreachable OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received by this client with the error code 'Protocol Address Unreachable'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."

::= { nhrpClientStatEntry 19 }

nhrpClientStatRxErrProtoError OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received by this client with the error code 'Protocol Error'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."

::= { nhrpClientStatEntry 20 }

nhrpClientStatRxErrSduSizeExceeded OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received by this client with the error code 'NHRP SDU Size

Exceeded'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [17]."  
::= { nhrpClientStatEntry 21 }

nhrpClientStatRxErrInvalidExtension OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received by this client with the error code 'Invalid Extension'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [17]."  
::= { nhrpClientStatEntry 22 }

nhrpClientStatRxErrAuthenticationFailure OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received by this client with the error code 'Authentication Failure'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [17]."  
::= { nhrpClientStatEntry 23 }

nhrpClientStatRxErrHopCountExceeded OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

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## DESCRIPTION

"The number of NHRP Error Indication packets received by this client with the error code 'Hop Count Exceeded'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Client re-initialization and at other times as indicated by the value of nhrpClientStatDiscontinuityTime."

## REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."

::= { nhrpClientStatEntry 24 }

nhrpClientStatDiscontinuityTime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The value of sysUpTime on the most recent occasion at which any one or more of this Client's counters suffered a discontinuity. If no such discontinuities have occurred since the last re-initialization of the local management subsystem or the NHRP Client re-initialization associated with this entry, then this object contains a zero value."

## REFERENCE

"[RFC 2233](#) [[18](#)]."

::= { nhrpClientStatEntry 25 }

--\*\*\*\*\*

-- NHRP Server Objects

--\*\*\*\*\*

nhrpServerObjects OBJECT IDENTIFIER ::= { nhrpObjects 3 }

--

-- The NHRP Next Hop Server Table

--

nhrpServerTable OBJECT-TYPE

SYNTAX SEQUENCE OF NhrpServerEntry

MAX-ACCESS not-accessible

```

STATUS      current
DESCRIPTION
    "This table contains information for a set of NHSeS
    associated with this agent."
 ::= { nhrpServerObjects 1 }

```

```

nhrpServerEntry OBJECT-TYPE
    SYNTAX      NhrpServerEntry

```

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```

MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Information about a single NHS."
INDEX       { nhrpServerIndex }
 ::= { nhrpServerTable 1 }

```

```

NhrpServerEntry ::= SEQUENCE {
    nhrpServerIndex                Unsigned32,
    nhrpServerInternetworkAddrType AddressFamilyNumbers,
    nhrpServerInternetworkAddr     NhrpGenAddr,
    nhrpServerNbmaAddrType         AddressFamilyNumbers,
    nhrpServerNbmaAddr             NhrpGenAddr,
    nhrpServerNbmaSubaddr          NhrpGenAddr,
    nhrpServerStorageType          StorageType,
    nhrpServerRowStatus            RowStatus
}

```

```

nhrpServerIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An identifier for the server that is unique within the
        scope of this agent."
    ::= { nhrpServerEntry 1 }

```

```

nhrpServerInternetworkAddrType OBJECT-TYPE
    SYNTAX      AddressFamilyNumbers
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The type of the internetwork layer address of this
        server. This object is used to interpret the value of

```



```
        nhrpServerInternetworkAddr."  
 ::= { nhrpServerEntry 2 }
```

nhrpServerInternetworkAddr OBJECT-TYPE

```
SYNTAX      NhrpGenAddr
```

```
MAX-ACCESS  read-create
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The value of the internetwork layer address of this  
    server."
```

```
 ::= { nhrpServerEntry 3 }
```

nhrpServerNbmaAddrType OBJECT-TYPE

```
SYNTAX      AddressFamilyNumbers
```

```
MAX-ACCESS  read-create
```

```
STATUS      current
```

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---

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```
DESCRIPTION
```

```
    "The type of the NBMA subnetwork address of this server.  
    This object is used to interpret the value of  
    nhrpServerNbmaAddr."
```

```
 ::= { nhrpServerEntry 4 }
```

nhrpServerNbmaAddr OBJECT-TYPE

```
SYNTAX      NhrpGenAddr
```

```
MAX-ACCESS  read-create
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The value of the NBMA subnetwork address of this  
    server."
```

```
 ::= { nhrpServerEntry 5 }
```

nhrpServerNbmaSubaddr OBJECT-TYPE

```
SYNTAX      NhrpGenAddr
```

```
MAX-ACCESS  read-create
```

```
STATUS      current
```

```
DESCRIPTION
```

```
    "The value of the NBMA subaddress of this server.  
    For NBMA address families without a subaddress  
    concept, this will be a zero-length OCTET STRING."
```

```
 ::= { nhrpServerEntry 6 }
```

nhrpServerStorageType OBJECT-TYPE

SYNTAX        StorageType  
MAX-ACCESS   read-create  
STATUS        current  
DESCRIPTION

"This object defines whether this row is kept in volatile storage and lost upon a Server crash or reboot situation, or if this row is backed up by nonvolatile or permanent storage."

DEFVAL        { nonVolatile }  
::= { nhrpServerEntry 7 }

nhrpServerRowStatus OBJECT-TYPE

SYNTAX        RowStatus  
MAX-ACCESS   read-create  
STATUS        current  
DESCRIPTION

"An object that allows entries in this table to be created and deleted using the RowStatus convention."

::= { nhrpServerEntry 8 }

--  
-- The Server Cache Table  
--

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---

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nhrpServerCacheTable OBJECT-TYPE

SYNTAX        SEQUENCE OF NhrpServerCacheEntry  
MAX-ACCESS   not-accessible  
STATUS        current  
DESCRIPTION

"This table extends the nhrpCacheTable for NHSes. If the nhrpCacheTable has a row added due to an NHS or based on information regarding an NHS then a row is also added in this table.

The rows in this table will be created when rows in the nhrpCacheTable are created. However, there may be rows created in the nhrpCacheTable which do not have corresponding rows in this table. For example, if the nhrpCacheTable has a row added due to a Next Hop Client which is co-resident on the same device as the NHS, a row will not be added to this table."

::= { nhrpServerObjects 2 }

```

nhrpServerCacheEntry OBJECT-TYPE
    SYNTAX      NhrpServerCacheEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Additional information kept by a NHS for a relevant
        Next Hop Resolution Cache entry."
    INDEX       {
                nhrpCacheInternetworkAddrType,
                nhrpCacheInternetworkAddr,
                ifIndex,
                nhrpCacheIndex
                }
    ::= { nhrpServerCacheTable 1 }

```

```

NhrpServerCacheEntry ::= SEQUENCE {
    nhrpServerCacheAuthoritative TruthValue,
    nhrpServerCacheUniqueness   TruthValue
}

```

```

nhrpServerCacheAuthoritative OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "An indication of whether this cache entry is
        authoritative, which means the entry was added because
        of a direct registration request with this server or
        by Server Cache Synchronization Protocol (SCSP) from
        an authoritative source."
    ::= { nhrpServerCacheEntry 1 }

```

```

nhrpServerCacheUniqueness OBJECT-TYPE
    SYNTAX      TruthValue
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The Uniqueness indicator for this cache
        entry used in duplicate address detection. This value
        cannot be changed after the entry is active."
    ::= { nhrpServerCacheEntry 2 }

```

```

--
-- The NHRP Server->Client Table
--

nhrpServerNhcTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF NhrpServerNhcEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A table of NHCs that are available for use by this NHS
        (Server)."
```

REFERENCE

```

    "Section 4 Configuration (Next Hop Servers),
    RFC 2332 [17]."
```

```

    ::= { nhrpServerObjects 3 }
```

nhrpServerNhcEntry OBJECT-TYPE

```

    SYNTAX      NhrpServerNhcEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An NHC that may be used by an NHS."
```

```

    INDEX       { nhrpServerIndex, nhrpServerNhcIndex }
```

```

    ::= { nhrpServerNhcTable 1 }
```

NhrpServerNhcEntry ::= SEQUENCE {

nhrpServerNhcIndex	Unsigned32,
nhrpServerNhcPrefixLength	Integer32,
nhrpServerNhcInternetNetworkAddrType	AddressFamilyNumbers,
nhrpServerNhcInternetNetworkAddr	NhrpGenAddr,
nhrpServerNhcNbmaAddrType	AddressFamilyNumbers,
nhrpServerNhcNbmaAddr	NhrpGenAddr,
nhrpServerNhcNbmaSubaddr	NhrpGenAddr,
nhrpServerNhcInUse	TruthValue,
nhrpServerNhcRowStatus	RowStatus

```

}
```

nhrpServerNhcIndex OBJECT-TYPE

```

    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
```

```

        "An identifier for an NHC available to an NHS."
 ::= { nhrpServerNhcEntry 1 }

nhrpServerNhcPrefixLength OBJECT-TYPE
    SYNTAX      Integer32 (0..255)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The number of bits that define the internetwork
        layer prefix associated with the
        nhrpServerNhcInternetworkAddr."
 ::= { nhrpServerNhcEntry 2 }

nhrpServerNhcInternetworkAddrType OBJECT-TYPE
    SYNTAX      AddressFamilyNumbers
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The type of the internetwork layer address of the
        NHRP Client represented in this entry. This object
        indicates how the value of nhrpServerNhcInternetworkAddr
        is to be interpreted."
 ::= { nhrpServerNhcEntry 3 }

nhrpServerNhcInternetworkAddr OBJECT-TYPE
    SYNTAX      NhrpGenAddr
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The value of the internetwork layer address of
        the NHRP Client represented by this entry. If this
        value is not known, this will be a zero-length
        OCTET STRING."
 ::= { nhrpServerNhcEntry 4 }

nhrpServerNhcNbmaAddrType OBJECT-TYPE
    SYNTAX      AddressFamilyNumbers
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The type of the NBMA subnetwork address of the NHRP
        Client represented by this entry. This object indicates
        how the values of nhrpServerNhcNbmaAddr and
        nhrpServerNhcNbmaSubaddr are to be interpreted."
 ::= { nhrpServerNhcEntry 5 }

nhrpServerNhcNbmaAddr OBJECT-TYPE
    SYNTAX      NhrpGenAddr

```

```
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "The NBMA subnetwork address of the NHC. The type of the
    address is indicated by the corresponding value of
    nhrpServerNbmaAddrType."
::= { nhrpServerNhcEntry 6 }
```

nhrpServerNhcNbmaSubaddr OBJECT-TYPE

```
SYNTAX        NhrpGenAddr
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "The NBMA subaddress of the NHC. For NBMA address families
    that do not have the concept of subaddress, this will
    be a zero-length OCTET STRING."
::= { nhrpServerNhcEntry 7 }
```

nhrpServerNhcInUse OBJECT-TYPE

```
SYNTAX        TruthValue
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
    "An indication of whether this NHC is in use by the NHS."
::= { nhrpServerNhcEntry 8 }
```

nhrpServerNhcRowStatus OBJECT-TYPE

```
SYNTAX        RowStatus
MAX-ACCESS    read-create
STATUS        current
DESCRIPTION
    "An object that allows entries in this table to be
    created and deleted using the RowStatus convention."
::= { nhrpServerNhcEntry 9 }
```

--

-- The Next Hop Server Statistics Table

--

nhrpServerStatTable OBJECT-TYPE

```
SYNTAX        SEQUENCE OF NhrpServerStatEntry
MAX-ACCESS    not-accessible
STATUS        current
DESCRIPTION
    "Statistics collected by Next Hop Servers."
::= { nhrpServerObjects 4 }
```

nhrpServerStatEntry OBJECT-TYPE  
 SYNTAX NhrpServerStatEntry  
 MAX-ACCESS not-accessible

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STATUS current

DESCRIPTION

"Statistics for a particular NHS. The statistics are broken into received (Rx), transmitted (Tx) and forwarded (Fw). Forwarded (Fw) would be done by a transit NHS."

INDEX { nhrpServerIndex }

::= { nhrpServerStatTable 1 }

NhrpServerStatEntry ::= SEQUENCE {

nhrpServerStatRxResolveReq	Counter32,
nhrpServerStatTxResolveReplyAck	Counter32,
nhrpServerStatTxResolveReplyNakProhibited	Counter32,
nhrpServerStatTxResolveReplyNakInsufResources	Counter32,
nhrpServerStatTxResolveReplyNakNoBinding	Counter32,
nhrpServerStatTxResolveReplyNakNotUnique	Counter32,

nhrpServerStatRxRegisterReq	Counter32,
nhrpServerStatTxRegisterAck	Counter32,
nhrpServerStatTxRegisterNakProhibited	Counter32,
nhrpServerStatTxRegisterNakInsufResources	Counter32,
nhrpServerStatTxRegisterNakAlreadyReg	Counter32,

nhrpServerStatRxPurgeReq	Counter32,
nhrpServerStatTxPurgeReq	Counter32,
nhrpServerStatRxPurgeReply	Counter32,
nhrpServerStatTxPurgeReply	Counter32,

-- Error Indications

nhrpServerStatRxErrUnrecognizedExtension	Counter32,
nhrpServerStatRxErrLoopDetected	Counter32,
nhrpServerStatRxErrProtoAddrUnreachable	Counter32,
nhrpServerStatRxErrProtoError	Counter32,
nhrpServerStatRxErrSduSizeExceeded	Counter32,
nhrpServerStatRxErrInvalidExtension	Counter32,
nhrpServerStatRxErrInvalidResReplyReceived	Counter32,
nhrpServerStatRxErrAuthenticationFailure	Counter32,
nhrpServerStatRxErrHopCountExceeded	Counter32,

nhrpServerStatTxErrUnrecognizedExtension	Counter32,
nhrpServerStatTxErrLoopDetected	Counter32,
nhrpServerStatTxErrProtoAddrUnreachable	Counter32,
nhrpServerStatTxErrProtoError	Counter32,
nhrpServerStatTxErrSduSizeExceeded	Counter32,
nhrpServerStatTxErrInvalidExtension	Counter32,
nhrpServerStatTxErrAuthenticationFailure	Counter32,
nhrpServerStatTxErrHopCountExceeded	Counter32,
-- Transit NHS statistics	
nhrpServerStatFwResolveReq	Counter32,

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nhrpServerStatFwResolveReply	Counter32,
nhrpServerStatFwRegisterReq	Counter32,
nhrpServerStatFwRegisterReply	Counter32,
nhrpServerStatFwPurgeReq	Counter32,
nhrpServerStatFwPurgeReply	Counter32,
nhrpServerStatFwErrorIndication	Counter32,
nhrpServerStatDiscontinuityTime	TimeStamp

}

nhrpServerStatRxResolveReq OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Resolution Requests received by this server.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 1 }

nhrpServerStatTxResolveReplyAck OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of positively acknowledged NHRP



Resolution Replies transmitted by this server.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 2 }

nhrpServerStatTxResolveReplyNakProhibited OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Resolution Replies transmitted by this server with the code 'Administratively Prohibited'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at

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NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 3 }

nhrpServerStatTxResolveReplyNakInsufResources OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Resolution Replies transmitted by this server with the code 'Insufficient Resources'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 4 }

nhrpServerStatTxResolveReplyNakNoBinding OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"The number of NAKed NHRP Resolution Replies transmitted by this server with the code 'No Internetworking Layer Address to NBMA Address Binding Exists'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 5 }

nhrpServerStatTxResolveReplyNakNotUnique OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"The number of NAKed NHRP Resolution Replies transmitted by this server with the code 'Binding Exists But Is Not Unique'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at

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other times as indicated by the value of nhrpServerStatDiscontinuityTime."  
::= { nhrpServerStatEntry 6 }

nhrpServerStatRxRegisterReq OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION

"The number of NHRP Registration Requests received by this server.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at

NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."  
 ::= { nhrpServerStatEntry 7 }

nhrpServerStatTxRegisterAck OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of positively acknowledged NHRP Registration Replies transmitted by this server.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 8 }

nhrpServerStatTxRegisterNakProhibited OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Registration Replies transmitted by this server with the code 'Administratively Prohibited'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 9 }

nhrpServerStatTxRegisterNakInsufResources OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Registration Replies

transmitted by this server with the code  
'Insufficient Resources'.

Discontinuities in the value of this counter can occur  
at re-initialization of the management system, at  
NHRP Server re-initialization and at  
other times as indicated by the value of  
nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 10 }

nhrpServerStatTxRegisterNakAlreadyReg OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NAKed NHRP Registration Replies  
transmitted by this server with the code  
'Unique Internetworking Layer Address Already  
Registered'.

Discontinuities in the value of this counter can occur  
at re-initialization of the management system, at  
NHRP Server re-initialization and at  
other times as indicated by the value of  
nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 11 }

nhrpServerStatRxPurgeReq OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Purge Requests received by  
this server.

Discontinuities in the value of this counter can occur  
at re-initialization of the management system, at  
NHRP Server re-initialization and at  
other times as indicated by the value of  
nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 12 }

nhrpServerStatTxPurgeReq OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"The number of NHRP Purge Requests transmitted by this server.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 13 }

nhrpServerStatRxPurgeReply OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"The number of NHRP Purge Replies received by this server.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 14 }

nhrpServerStatTxPurgeReply OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"The number of NHRP Purge Replies transmitted by this server.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 15 }

nhrpServerStatRxErrUnrecognizedExtension OBJECT-TYPE

SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION  
"The number of NHRP Error Indication packets received

by this server with the error code

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'Unrecognized Extension'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."

::= { nhrpServerStatEntry 16 }

nhrpServerStatRxErrLoopDetected OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received by this server with the error code 'NHRP Loop Detected'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."

::= { nhrpServerStatEntry 17 }

nhrpServerStatRxErrProtoAddrUnreachable OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received by this server with the error code 'Protocol Address Unreachable'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of

nhrpServerStatDiscontinuityTime."  
REFERENCE  
        "[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."  
::= { nhrpServerStatEntry 18 }

nhrpServerStatRxErrProtoError OBJECT-TYPE  
SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current

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DESCRIPTION

"The number of NHRP Error Indication packets received by this server with the error code 'Protocol Error'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

        "[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."  
::= { nhrpServerStatEntry 19 }

nhrpServerStatRxErrSduSizeExceeded OBJECT-TYPE  
SYNTAX Counter32  
MAX-ACCESS read-only  
STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received by this server with the error code 'NHRP SDU Size Exceeded'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

        "[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."  
::= { nhrpServerStatEntry 20 }

nhrpServerStatRxErrInvalidExtension OBJECT-TYPE  
SYNTAX Counter32

MAX-ACCESS read-only  
 STATUS current  
 DESCRIPTION  
     "The number of NHRP Error Indication packets received  
     by this server with the error code 'Invalid Extension'.  
  
     Discontinuities in the value of this counter can occur  
     at re-initialization of the management system, at  
     NHRP Server re-initialization and at  
     other times as indicated by the value of  
     nhrpServerStatDiscontinuityTime."  
 REFERENCE  
     "[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."  
     ::= { nhrpServerStatEntry 21 }

nhrpServerStatRxErrInvalidResReplyReceived OBJECT-TYPE  
     SYNTAX Counter32

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MAX-ACCESS read-only  
 STATUS current  
 DESCRIPTION  
     "The number of NHRP Error Indication packets received  
     by this server with the error code 'Invalid Resolution  
     Reply Received'.  
  
     Discontinuities in the value of this counter can occur  
     at re-initialization of the management system, at  
     NHRP Server re-initialization and at  
     other times as indicated by the value of  
     nhrpServerStatDiscontinuityTime."  
 REFERENCE  
     "[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."  
     ::= { nhrpServerStatEntry 22 }

nhrpServerStatRxErrAuthenticationFailure OBJECT-TYPE  
     SYNTAX Counter32  
     MAX-ACCESS read-only  
     STATUS current  
     DESCRIPTION  
         "The number of NHRP Error Indication packets  
         received by this server with the error code  
         'Authentication Failure'.



Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [17]."

::= { nhrpServerStatEntry 23 }

nhrpServerStatRxErrHopCountExceeded OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets received by this server with the error code 'Hop Count Exceeded'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [17]."

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::= { nhrpServerStatEntry 24 }

nhrpServerStatTxErrUnrecognizedExtension OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets transmitted by this server with the error code 'Unrecognized Extension'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."  
 ::= { nhrpServerStatEntry 25 }

nhrpServerStatTxErrLoopDetected OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets transmitted by this server with the error code 'NHRP Loop Detected'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."  
 ::= { nhrpServerStatEntry 26 }

nhrpServerStatTxErrProtoAddrUnreachable OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets transmitted by this server with the error code 'Protocol Address Unreachable'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at

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NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."  
 ::= { nhrpServerStatEntry 27 }

nhrpServerStatTxErrProtoError OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets transmitted by this server with the error code 'Protocol Error'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."

::= { nhrpServerStatEntry 28 }

nhrpServerStatTxErrSduSizeExceeded OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets transmitted by this server with the error code 'NHRP SDU Size Exceeded'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [[17](#)]."

::= { nhrpServerStatEntry 29 }

nhrpServerStatTxErrInvalidExtension OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets transmitted by this server with the error code

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [17]."

::= { nhrpServerStatEntry 30 }

nhrpServerStatTxErrAuthenticationFailure OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets transmitted by this server with the error code 'Authentication Failure'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [17]."

::= { nhrpServerStatEntry 31 }

nhrpServerStatTxErrHopCountExceeded OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of NHRP Error Indication packets transmitted by this server with the error code 'Hop Count Exceeded'.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

REFERENCE

"[Section 5.2.7](#) NHRP Error Indication, [RFC 2332](#) [17]."

::= { nhrpServerStatEntry 32 }

nhrpServerStatFwResolveReq OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

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STATUS current

## DESCRIPTION

"The number of NHRP Resolution Requests forwarded by this server acting as a transit NHS.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 33 }

## nhrpServerStatFwResolveReply OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of NHRP Resolution Replies forwarded by this server acting as a transit NHS.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 34 }

## nhrpServerStatFwRegisterReq OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of NHRP Registration Requests forwarded by this server acting as a transit NHS.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

::= { nhrpServerStatEntry 35 }

## nhrpServerStatFwRegisterReply OBJECT-TYPE

SYNTAX           Counter32  
MAX-ACCESS   read-only  
STATUS         current  
DESCRIPTION  
    "The number of NHRP Registration Replies forwarded  
    by this server acting as a transit NHS."

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Discontinuities in the value of this counter can occur  
at re-initialization of the management system, at  
NHRP Server re-initialization and at  
other times as indicated by the value of  
nhrpServerStatDiscontinuityTime."  
 ::= { nhrpServerStatEntry 36 }

nhrpServerStatFwPurgeReq OBJECT-TYPE

SYNTAX           Counter32  
MAX-ACCESS   read-only  
STATUS         current  
DESCRIPTION  
    "The number of NHRP Purge Requests forwarded  
    by this server acting as a transit NHS."

Discontinuities in the value of this counter can occur  
at re-initialization of the management system, at  
NHRP Server re-initialization and at  
other times as indicated by the value of  
nhrpServerStatDiscontinuityTime."  
 ::= { nhrpServerStatEntry 37 }

nhrpServerStatFwPurgeReply OBJECT-TYPE

SYNTAX           Counter32  
MAX-ACCESS   read-only  
STATUS         current  
DESCRIPTION  
    "The number of NHRP Purge Replies forwarded by this  
    server acting as a transit NHS."

Discontinuities in the value of this counter can occur  
at re-initialization of the management system, at  
NHRP Server re-initialization and at  
other times as indicated by the value of  
nhrpServerStatDiscontinuityTime."

```
::= { nhrpServerStatEntry 38 }
```

```
nhrpServerStatFwErrorIndication OBJECT-TYPE
```

```
SYNTAX Counter32
```

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

```
STATUS current
```

```
DESCRIPTION
```

"The number of NHRP Error Indication packets forwarded by this server acting as a transit NHS.

Discontinuities in the value of this counter can occur at re-initialization of the management system, at NHRP Server re-initialization and at other times as indicated by the value of nhrpServerStatDiscontinuityTime."

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```
::= { nhrpServerStatEntry 39 }
```

```
nhrpServerStatDiscontinuityTime OBJECT-TYPE
```

```
SYNTAX TimeStamp
```

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

```
STATUS current
```

```
DESCRIPTION
```

"The value of sysUpTime on the most recent occasion at which any one or more of this Server's counters suffered a discontinuity. If no such discontinuities have occurred since the last re-initialization of the local management subsystem or the NHRP Server re-initialization associated with this entry, then this object contains a zero value."

```
REFERENCE
```

"[RFC 2233](#) [[18](#)]."

```
::= { nhrpServerStatEntry 40 }
```

```
--*****
-- Module Compliance Statement
--*****
```

```
nhrpConformance OBJECT IDENTIFIER ::= { nhrpMIB 2 }
```

```
nhrpCompliances
```

```
OBJECT IDENTIFIER ::= { nhrpConformance 1 }
```

```

nhrpGroups
  OBJECT IDENTIFIER ::= { nhrpConformance 2 }

nhrpModuleCompliance MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "The compliance statement for the NHRP MIB."
  MODULE -- this module
    MANDATORY-GROUPS { nhrpGeneralGroup }

    GROUP nhrpClientGroup
    DESCRIPTION
      "This group must be supported only by stations that
      are NHRP clients."

    GROUP nhrpServerGroup
    DESCRIPTION
      "This group must be supported only by stations that
      are NHRP servers."
  ::= { nhrpCompliances 1 }

nhrpGeneralGroup OBJECT-GROUP
  OBJECTS {

```

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```

  nhrpNextIndex,
  nhrpCachePrefixLength,
  nhrpCacheNextHopInternetworkAddr,
  nhrpCacheNbmaAddrType,
  nhrpCacheNbmaAddr,
  nhrpCacheNbmaSubaddr,
  nhrpCacheType,
  nhrpCacheState,
  nhrpCacheHoldingTimeValid,
  nhrpCacheHoldingTime,
  nhrpCacheNegotiatedMtu,
  nhrpCachePreference,
  nhrpCacheStorageType,
  nhrpCacheRowStatus,
  nhrpPurgeCacheIdentifier,
  nhrpPurgePrefixLength,
  nhrpPurgeRequestID,
  nhrpPurgeReplyExpected,
  nhrpPurgeRowStatus

```



```

    }
    STATUS      current
    DESCRIPTION
        "Objects that apply to both NHRP clients and NHRP
        servers."
    ::= { nhrpGroups 1 }

nhrpClientGroup OBJECT-GROUP
    OBJECTS {
        nhrpClientInternetworkAddrType,
        nhrpClientInternetworkAddr,
        nhrpClientNbmaAddrType,
        nhrpClientNbmaAddr,
        nhrpClientNbmaSubaddr,
        nhrpClientInitialRequestTimeout,
        nhrpClientRegistrationRequestRetries,
        nhrpClientResolutionRequestRetries,
        nhrpClientPurgeRequestRetries,
        nhrpClientDefaultMtu,
        nhrpClientHoldTime,
        nhrpClientRequestID,
        nhrpClientStorageType,
        nhrpClientRowStatus,
        nhrpClientRegUniqueness,
        nhrpClientRegState,
        nhrpClientRegRowStatus,
        nhrpClientNhsInternetworkAddrType,
        nhrpClientNhsInternetworkAddr,
        nhrpClientNhsNbmaAddrType,
        nhrpClientNhsNbmaAddr,
        nhrpClientNhsNbmaSubaddr,

```

```

        nhrpClientNhsInUse,
        nhrpClientNhsRowStatus,
        nhrpClientStatTxResolveReq,
        nhrpClientStatRxResolveReplyAck,
        nhrpClientStatRxResolveReplyNakProhibited,
        nhrpClientStatRxResolveReplyNakInsufResources,
        nhrpClientStatRxResolveReplyNakNoBinding,
        nhrpClientStatRxResolveReplyNakNotUnique,
        nhrpClientStatTxRegisterReq,
        nhrpClientStatRxRegisterAck,
        nhrpClientStatRxRegisterNakProhibited,

```

```

    nhrpClientStatRxRegisterNakInsufResources,
    nhrpClientStatRxRegisterNakAlreadyReg,
    nhrpClientStatRxPurgeReq,
    nhrpClientStatTxPurgeReq,
    nhrpClientStatRxPurgeReply,
    nhrpClientStatTxPurgeReply,
    nhrpClientStatTxErrorIndication,
    nhrpClientStatRxErrUnrecognizedExtension,
    nhrpClientStatRxErrLoopDetected,
    nhrpClientStatRxErrProtoAddrUnreachable,
    nhrpClientStatRxErrProtoError,
    nhrpClientStatRxErrSduSizeExceeded,
    nhrpClientStatRxErrInvalidExtension,
    nhrpClientStatRxErrAuthenticationFailure,
    nhrpClientStatRxErrHopCountExceeded,
    nhrpClientStatDiscontinuityTime
}
STATUS      current
DESCRIPTION
    "Objects that apply only to NHRP clients."
 ::= { nhrpGroups 2 }

```

#### nhrpServerGroup OBJECT-GROUP

```

OBJECTS {
    nhrpServerInternetworkAddrType,
    nhrpServerInternetworkAddr,
    nhrpServerNbmaAddrType,
    nhrpServerNbmaAddr,
    nhrpServerNbmaSubaddr,
    nhrpServerStorageType,
    nhrpServerRowStatus,
    nhrpServerCacheAuthoritative,
    nhrpServerCacheUniqueness,
    nhrpServerNhcPrefixLength,
    nhrpServerNhcInternetworkAddrType,
    nhrpServerNhcInternetworkAddr,
    nhrpServerNhcNbmaAddrType,
    nhrpServerNhcNbmaAddr,
    nhrpServerNhcNbmaSubaddr,

```

```

    nhrpServerNhcInUse,
    nhrpServerNhcRowStatus,
    nhrpServerStatRxResolveReq,

```

```

    nhrpServerStatTxResolveReplyAck,
    nhrpServerStatTxResolveReplyNakProhibited,
    nhrpServerStatTxResolveReplyNakInsufResources,
    nhrpServerStatTxResolveReplyNakNoBinding,
    nhrpServerStatTxResolveReplyNakNotUnique,
    nhrpServerStatRxRegisterReq,
    nhrpServerStatTxRegisterAck,
    nhrpServerStatTxRegisterNakProhibited,
    nhrpServerStatTxRegisterNakInsufResources,
    nhrpServerStatTxRegisterNakAlreadyReg,
    nhrpServerStatRxPurgeReq,
    nhrpServerStatTxPurgeReq,
    nhrpServerStatRxPurgeReply,
    nhrpServerStatTxPurgeReply,
    nhrpServerStatRxErrUnrecognizedExtension,
    nhrpServerStatRxErrLoopDetected,
    nhrpServerStatRxErrProtoAddrUnreachable,
    nhrpServerStatRxErrProtoError,
    nhrpServerStatRxErrSduSizeExceeded,
    nhrpServerStatRxErrInvalidExtension,
    nhrpServerStatRxErrInvalidResReplyReceived,
    nhrpServerStatRxErrAuthenticationFailure,
    nhrpServerStatRxErrHopCountExceeded,
    nhrpServerStatTxErrUnrecognizedExtension,
    nhrpServerStatTxErrLoopDetected,
    nhrpServerStatTxErrProtoAddrUnreachable,
    nhrpServerStatTxErrProtoError,
    nhrpServerStatTxErrSduSizeExceeded,
    nhrpServerStatTxErrInvalidExtension,
    nhrpServerStatTxErrAuthenticationFailure,
    nhrpServerStatTxErrHopCountExceeded,
    nhrpServerStatFwResolveReq,
    nhrpServerStatFwResolveReply,
    nhrpServerStatFwRegisterReq,
    nhrpServerStatFwRegisterReply,
    nhrpServerStatFwPurgeReq,
    nhrpServerStatFwPurgeReply,
    nhrpServerStatFwErrorIndication,
    nhrpServerStatDiscontinuityTime
}
STATUS      current
DESCRIPTION
    "Objects that apply only to NHRP servers."
::= { nhrpGroups 3 }

```

END

## 5. IANA Considerations

The Internet Assigned Numbers Authority (IANA) has been and continues to be responsible for maintaining the ADDRESS FAMILY NUMBERS (<http://www.isi.edu/in-notes/iana/assignments/address-family-numbers>) name space assignments. The request made here is for the IANA to place this list in a MIB module, such that it may be imported into other MIBs. The motivation for doing this is to allow MIBs to not have to change when a new assignment is made to the ADDRESS FAMILY NUMBERS. This is very similar to the motivation behind the IANAifType-MIB.

An example of what the MIB would look like is included in this document.

Any additions or changes to the list of ADDRESS FAMILY NUMBERS registered via IANA will be done as they have in the past and this document does not propose any changes to the ADDRESS FAMILY NUMBERS other than to place them into a MIB, of which an example is given in this document (see IANA Address Family Numbers MIB).

## 6. Security

There are a number of management objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

The NHRP Protocol, [RFC 2332](#) [17], Section 5.2.4.4 discusses security. There is an authentication option which should be utilized to authenticate the source and also provide data integrity to the NHRP payload. This MIB does not contain any managed objects which configure or expose security information such as that needed for NHRP authentication or data integrity.

The following items were deemed to jeopardize security and thus, were NOT added to this MIB. Items denoted as (configurable) are those which would need values. Items denoted as (read-only) are those which would provide information. Although the NHRP Protocol [17], requires or has this information, exposing it in a MIB would jeopardize the entire NBMA domain where NHRP was being used. Therefore, these items have been omitted from the MIB.

1. (configurable) enable/disable security

2. (configurable) SPI (security parameter index).  
Depending upon the implementation,  
there may be multiple SPIs, and these would

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- be configurable also. For example, if the  
implementation switched to a different SPI  
after a given time.
3. (configurable) algorithm.  
The HMAC-MD5-128 is the default hash algorithm.
  4. (configurable) lifetime value in seconds.
  5. (read-only) key.
  6. (read-only) list of users who have access  
to the above information.

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## [7.](#) Intellectual Property

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## [8.](#) Acknowledgments

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May 1999

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## [12.](#) IANA Address Family Numbers MIB

This appendix defines the initial content of the IANA-ADDRESS-FAMILY-NUMBERS-MIB. This section should be removed from this document prior to its approval, at which time this MIB will be administered by IANA.

The branch for this MIB needs to be determined, and an appropriate number should be added where XXX is currently.

IANA-ADDRESS-FAMILY-NUMBERS-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY,  
mib-2 FROM SNMPv2-SMI  
TEXTUAL-CONVENTION FROM SNMPv2-TC;

ianaAddressFamilyNumbers MODULE-IDENTITY

LAST-UPDATED "9905191200Z" -- May 19, 1999

ORGANIZATION "IANA"

CONTACT-INFO

"Postal: Internet Assigned Numbers Authority  
USC/Information Sciences Institute  
4676 Admiralty Way  
Marina del Rey, CA 90292-6695  
USA

Tel: +1 310-822-1511  
 E-Mail: iana@isi.edu"

DESCRIPTION  
 "The MIB module defines the AddressFamilyNumbers  
 textual convention."

-- revision history

REVISION "9905191200Z" -- May 19, 1999  
 -- RFC-Editor assigns RFC xxxx

DESCRIPTION "Initial version, published as RFC xxxx."

::= { mib-2 XXX } -- to be assigned by IANA

AddressFamilyNumbers ::= TEXTUAL-CONVENTION

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STATUS current  
 DESCRIPTION  
 "The definition of this textual convention with the  
 addition of newly assigned values is published  
 periodically by the IANA, in either the Assigned  
 Numbers RFC, or some derivative of it specific to  
 Internet Network Management number assignments.  
 (The latest arrangements can be obtained by  
 contacting the IANA.)

The enumerations are described as:

other(0), -- none of the following  
 ipv4(1), -- IP Version 4  
 ipv6(2), -- IP Version 6  
 nsap(3), -- NSAP  
 hdlc(4), -- (8-bit multidrop)  
 bbn1822(5),  
 all802(6), -- (includes all 802 media  
 -- plus Ethernet 'canonical format')  
 e163(7),  
 e164(8), -- (SMDS, Frame Relay, ATM)  
 f69(9), -- (Telex)  
 x121(10), -- (X.25, Frame Relay)  
 ipx(11), -- IPX (Internet Protocol Exchange)  
 appletalk(12), -- Apple Talk

```
decnetIV(13),    -- DEC Net Phase IV
banyanVines(14), -- Banyan Vines
e164withNsap(15),
                -- (E.164 with NSAP format subaddress)

reserved(65535)
```

Requests for new values should be made to IANA via  
email (iana@isi.edu)."

```
SYNTAX  INTEGER {
    other(0),
    ipV4(1),
    ipV6(2),
    nsap(3),
    hdlc(4),
    bbn1822(5),
    all802(6),
    e163(7),
    e164(8),
    f69(9),
    x121(10),
```

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```
    ipx(11),
    appletalk(12),
    decnetIV(13),
    banyanVines(14),
    e164withNsap(15),
    reserved(65535)
}
```

END

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