AppleTalk Management Information Base

Status of this Memo

This memo defines objects for managing AppleTalk objects for use with the SNMP protocol. This memo is a product of the AppleTalk-IP Working Group of the Internet Engineering Task Force (IETF). This RFC specifies an IAB standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "IAB Official Protocol Standards" for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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1. Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in TCP/IP-based internets. In particular, it defines objects for managing AppleTalk networks.
2. The Network Management Framework

The Internet-standard Network Management Framework consists of three components. They are:

- **RFC 1155** which defines the SMI, the mechanisms used for describing and naming objects for the purpose of management. **RFC 1212** defines a more concise description mechanism, which is wholly consistent with the SMI.

- **RFC 1156** which defines MIB-I, the core set of managed objects for the Internet suite of protocols. **RFC 1213**, defines MIB-II, an evolution of MIB-I based on implementation experience and new operational requirements.

- **RFC 1157** which defines the SNMP, the protocol used for network access to managed objects.

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

3. Objects

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) [7] defined in the SMI. In particular, each object has a name, a syntax, and an encoding. The name is an object identifier, an administratively assigned name, which specifies an object type. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the OBJECT DESCRIPTOR, to also refer to the object type.

The syntax of an object type defines the abstract data structure corresponding to that object type. The ASN.1 language is used for this purpose. However, the SMI [3] purposely restricts the ASN.1 constructs which may be used. These restrictions are explicitly made for simplicity.

The encoding of an object type is simply how that object type is represented using the object type’s syntax. Implicitly tied to the notion of an object type’s syntax and encoding is how the object type is represented when being transmitted on the network.

The SMI specifies the use of the basic encoding rules of ASN.1 [8], subject to the additional requirements imposed by the SNMP.
3.1. Format of Definitions

Section 5 contains the specification of all object types contained in this MIB module. The object types are defined using the conventions defined in the SMI, as amended by the extensions specified in [9,10].

4. Overview

AppleTalk is a protocol suite which features an open peer-to-peer architecture that runs over a variety of transmission media. AppleTalk is defined in [10]. This protocol suite interoperates with the IP protocol suite through various encapsulation methods. As large AppleTalk networks are built that coexist with large IP networks, a method to manage the AppleTalk networks with SNMP becomes necessary. This MIB defines managed objects to be used for managing AppleTalk networks.

4.1. Structure of MIB

The objects are arranged into the following groups:

- LLAP
- AARP
- ATPort
- DDP
- RTMP
- KIP
- ZIP
- NBP
- ATEcho

These groups are the basic unit of conformance. If the semantics of a group is applicable to an implementation, then it must implement all objects in that group. For example, a managed agent must implement the KIP group if and only if it implements the KIP protocol.

These groups are defined to provide a means of assigning object identifiers, and to provide a method for managed agents to know which objects they must implement.

4.2. The LocalTalk Link Access Protocol Group

The LocalTalk Link Access Protocol (LLAP) is a medium-speed data-link protocol designed for low cost and plug-and-play operation. The LLAP group is designed to manage all interfaces on a managed device that use this protocol.
4.3. The AppleTalk Address Resolution Protocol Group

The AppleTalk Address Resolution Protocol (AARP) is used to map between AppleTalk node addresses, used by the Datagram Delivery Protocol, and the addresses of the underlying data link layer. The AARP table allows for management of the Address Mapping Table on the managed device.

4.4. The AppleTalk Port Group

An AppleTalk Port is a logical connection to a network over which AppleTalk packets can be transmitted. This group allows the management of the configuration of these AppleTalk ports.

4.5. The Datagram Delivery Protocol Group

The Datagram Delivery Protocol (DDP) is the network-layer protocol that is responsible for the socket-to-socket delivery of datagrams over the AppleTalk Internet. This group manages the DDP layer on the managed device.

4.6. The Routing Table Maintenance Protocol Group

The Routing Table Maintenance Protocol (RTMP) is used by AppleTalk routers to create and maintain the routing tables that dictate the process of forwarding datagrams on the AppleTalk internet. The RTMP group manages the RTMP protocol as well as the routing tables generated by this protocol.

4.7. The Kinetics Internet Protocol Group

The Kinetics Internet Protocol (KIP) is a protocol for encapsulating and routing AppleTalk datagrams over an IP internet. This name is historical. The KIP group manages the KIP routing protocol as well as the routing tables generated by this protocol.

4.8. The Zone Information Protocol Group

The Zone Information Protocol (ZIP) is used to maintain a mapping between networks and zone names to facilitate the name lookup process performed by the Name Binding Protocol. The ZIP group manages this protocol and the mapping it produces.

4.9. The Name Binding Protocol Group

The Name Binding Protocol (NBP) is a transport-level protocol that is used to convert human readable service names into the numeric AppleTalk network addresses needed for communicating across the
AppleTalk network. The NBP group manages this protocol and the NBP services that exist on the managed device.

4.10. The AppleTalk Echo Protocol Group

The AppleTalk Echo Protocol is a transport-level protocol used to test and verify the status of the AppleTalk internet. The AtEcho group manages this protocol.

4.11. Textual Conventions

A new data type is introduced as a textual convention in this MIB document. This textual convention enhances the readability of the specification and can ease comparison with other specifications if appropriate. It should be noted that the introduction of this textual convention has no effect on either the syntax or the semantics of any managed objects. The use of this is merely an artifact of the explanatory method used. Objects defined in terms of this method are always encoded by means of the rules that define the primitive type. Hence, no changes to the SMI or the SNMP are necessary to accommodate this textual convention which is adopted merely for the convenience of readers and writers in pursuit of the elusive goal of clear, concise, and unambiguous MIB documents.

The new data type is:

\[
\text{DdpAddress ::= } \quad \begin{array}{l}
\quad \text{-- 2 octets of net number,} \\
\quad \text{-- 1 octet of node number} \\
\quad \text{OCTET STRING (SIZE (3))}
\end{array}
\]

5. Definitions

\textit{RFC1243\textendash MIB DEFINITIONS ::= BEGIN}

\textbf{IMPORTS}

\textbf{Counter, IpAddress}

\textbf{FROM RFC1155\textendash SMI}

\textbf{DisplayString, mib-2}

\textbf{FROM RFC1213\textendash MIB}

\textbf{OBJECT-TYPE}

\textbf{FROM RFC-1212;}

\begin{itemize}
\item [-] This MIB module uses the extended OBJECT-TYPE macro as defined in [9]
\end{itemize}

\begin{itemize}
\item [-] AppleTalk MIB
DdpAddress ::= -- 2 octets of net number
-- 1 octet of node number
     OCTET STRING (SIZE (3))
-- This data type is used for encoding a DDP protocol
-- address. The format of this address is a serial
-- encoding of the two octets of network number in
-- network byte order, followed by the 1 octet node
-- number.

llap OBJECT IDENTIFIER ::= { appletalk 1 }
aarp OBJECT IDENTIFIER ::= { appletalk 2 }
atport OBJECT IDENTIFIER ::= { appletalk 3 }
ddp OBJECT IDENTIFIER ::= { appletalk 4 }
rtmp OBJECT IDENTIFIER ::= { appletalk 5 }
kip OBJECT IDENTIFIER ::= { appletalk 6 }
zip OBJECT IDENTIFIER ::= { appletalk 7 }
nbp OBJECT IDENTIFIER ::= { appletalk 8 }
atecho OBJECT IDENTIFIER ::= { appletalk 9 }

-- The LLAP Group

llapTable OBJECT-TYPE
SYNTAX SEQUENCE OF LlapEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
 "The list of LLAP entries."
 ::= { llap 1 }

LlapEntry OBJECT-TYPE
SYNTAX LlapEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
 "An LLAP entry containing objects for the
 LocalTalk Link Access Protocol for a particular
 LocalTalk interface."
INDEX { llapIfIndex }
 ::= { llapTable 1 }

LlapEntry ::= SEQUENCE {
   llapIfIndex INTEGER,
   llapInPkts Counter,
   llapOutPkts Counter,
   llapInNoHandlers Counter,
llapInLengthErrors        Counter,
llapInBads               Counter,
llapCollisions           Counter,
llapDefers               Counter,
llapNoDataErrors         Counter,
llapRandomCTSErrors      Counter,
llapFCSErrors            Counter

llapIfIndex OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The LLAP interface to which this entry pertains. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex."
::= { llapEntry 1 }

llapInPkts OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of good packets received on this LocalTalk interface."
::= { llapEntry 2 }

llapOutPkts OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of packets transmitted on this LocalTalk interface."
::= { llapEntry 3 }

llapInNoHandlers OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of good packets received on this LocalTalk interface for which there was no protocol handler."
::= { llapEntry 4 }
llapInLengthErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of packets received on this
LocalTalk interface whose actual length did not
match the length in the header."
 ::= { llapEntry 5 }

llapInErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of packets containing errors
received on this LocalTalk interface."
 ::= { llapEntry 6 }

llapCollisions OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of collisions assumed on this
LocalTalk interface due to the lack of a lapCTS
reply."
 ::= { llapEntry 7 }

llapDefers OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of times this LocalTalk
interface deferred to other packets."
 ::= { llapEntry 8 }

llapNoDataErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of times this LocalTalk
interface received a lapRTS packet and expected
a data packet, but did not receive any data
packet."
 ::= { llapEntry 9 }
llapRandomCTSErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of times this LocalTalk interface received a lapCTS packet that was not solicited by a lapRTS packet."
::= { llapEntry 10 }

llapFCSErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of times this LocalTalk interface received a packet with an FCS (Frame Check Sequence) error."
::= { llapEntry 11 }

-- The AARP Group
aarpTable OBJECT-TYPE
SYNTAX SEQUENCE OF AarpEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"The AppleTalk Address Translation Table contains an equivalence of AppleTalk Network Addresses to the link layer physical address."
::= { aarpTable 1 }

AarpEntry OBJECT-TYPE
SYNTAX AarpEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"Each entry contains one AppleTalk Network Address to physical address equivalence."
INDEX { aarpIfIndex, aarpNetAddress }
::= { aarpTable 1 }

AarpEntry ::= SEQUENCE {
aarpIfIndex INTEGER,
aarpPhysAddress OCTET STRING,
aarpNetAddress DdpAddress
}
aarpIfIndex OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The interface on which this entry’s equivalence is effective. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex."
 ::= { aarpEntry 1 }

aarpPhysAddress OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The media-dependent physical address"
 ::= { aarpEntry 2 }

aarpNetAddress OBJECT-TYPE
SYNTAX DdpAddress
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The AppleTalk Network Address corresponding to the media-dependent physical address."
 ::= { aarpEntry 3 }

-- The ATPort Group

atportTable OBJECT-TYPE
SYNTAX SEQUENCE OF AtportEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"A list of AppleTalk ports for this entity."
 ::= { atport 1 }

atportEntry OBJECT-TYPE
SYNTAX AtportEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"The description of one of the AppleTalk ports on this entity."
INDEX { atportIndex }
AtportEntry ::= SEQUENCE {
  atportIndex               INTEGER,
  atportDescr               DisplayString,
  atportType                INTEGER,
  atportNetStart            OCTET STRING (SIZE(2)),
  atportNetEnd              OCTET STRING (SIZE(2)),
  atportNetAddress          DdpAddress,
  atportStatus              INTEGER,
  atportNetConfig           INTEGER,
  atportZoneConfig          INTEGER,
  atportZone                OCTET STRING,
  atportIfIndex             INTEGER
}

atportIndex OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-only
STATUS mandatory
DESCRIPTION
"A unique value for each AppleTalk port. Its value is between 1 and the total number of AppleTalk ports. The value for each port must remain constant at least from the re-initialization of the entity's network management system to the next re-initialization."
 ::= { atportEntry 1 }

atportDescr OBJECT-TYPE
SYNTAX DisplayString
ACCESS read-only
STATUS mandatory
DESCRIPTION
"A text string containing information about the port. This string is intended for presentation to a human; it must not contain anything but printable ASCII characters."
 ::= { atportEntry 2 }

atportType OBJECT-TYPE
SYNTAX INTEGER {
  other(1), -- none of the following
  localtalk(2),
  ethertalk1(3),
  ethertalk2(4),
  tokentalk(5),
}
iptalk(6),
serial-ppp(7),
serial-nonstandard(8),
virtual(9)
}
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The type of port, distinguished by the protocol
immediately below DDP in the protocol stack."
::= { atportEntry 3 }

atportNetStart OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(2))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The first AppleTalk network address in the range
configured for this port. This is a two octet
DDP network address in network byte order."
::= { atportEntry 4 }

atportNetEnd OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(2))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The last AppleTalk network address in the range
configured for this port. This is a two octet
DDP network address in network byte order. If the
network to which this AppleTalk port is
connected is a Phase 1 network or a non-extended
network, the value for atportNetEnd shall be two
octets of zero."
::= { atportEntry 5 }

atportNetAddress OBJECT-TYPE
SYNTAX DdpAddress
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The AppleTalk network address configured for this
port."
::= { atportEntry 6 }

atportStatus OBJECT-TYPE
SYNTAX INTEGER {
    operational(1),
unconfigured(2),
off(3),
invalid(4)
}

ACCESS read-write
STATUS mandatory
DESCRIPTION
"The configuration status of this port.

Setting this object to the value invalid(4)
has the effect of invalidating the corresponding
entry in the atportTable. That is, it
effectively disassociates the mapping identified
with said entry. It is an
implementation-specific matter as to whether the
agent removes an invalidated entry from the table.
Accordingly, management stations must be
prepared to receive from agents tabular
information corresponding to entries not
currently in use. Proper interpretation of such
entries requires examination of the relevant
atportStatus object."

::= { atportEntry 7 }

atportNetConfig OBJECT-TYPE
SYNTAX INTEGER {
  configured(1),   -- explicit configuration.
  garnered(2),    -- assumed from inspection of net.
  guessed(3),    -- a "random" configuration.
  unconfigured(4)
}

ACCESS read-only
STATUS mandatory
DESCRIPTION
"The configuration status of this port."

::= { atportEntry 8 }

atportZoneConfig OBJECT-TYPE
SYNTAX INTEGER {
  configured(1),   -- explicit configuration
  garnered(2),    -- assumed from inspection of net.
  guessed(3),    -- a "random" configuration.
  unconfigured(4)
}

ACCESS read-only
STATUS mandatory
DESCRIPTION
"The configuration status of the zone information
atportZone OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The zone name configured for this AppleTalk port."
::= { atportEntry 10 }

atportIfIndex OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The physical interface associated with this AppleTalk port. The interface identified by a particular value of this index is the same interface as identified by the same value of ifIndex."
::= { atportEntry 11 }

-- The DDP Group

ddpOutRequests OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of DDP datagrams which were supplied to DDP by local DDP clients in requests for transmission. Note that this counter does not include any datagrams counted in ddpForwRequests."
::= { ddp 1 }

ddpOutShorts OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of short DDP datagrams which were transmitted from this entity."
::= { ddp 2 }
ddpOutLongs OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of long DDP datagrams which were transmitted from this entity."
 ::= { ddp 3 }

ddpInReceives OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of input datagrams received by DDP, including those received in error."
 ::= { ddp 4 }

ddpForwRequests OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The number of input datagrams for which this entity was not their final DDP destination, as a result of which an attempt was made to find a route to forward them to that final destination."
 ::= { ddp 5 }

ddpInLocalDatagrams OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of input DDP datagrams for which this entity was their final DDP destination."
 ::= { ddp 6 }

ddpNoProtocolHandlers OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of DDP datagrams addressed to this entity that were addressed to an upper layer protocol for which no protocol handler existed."
ddpOutNoRoutes OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION "The total number of DDP datagrams dropped because a route could not be found to their final destination."

ddpTooShortErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION "The total number of input DDP datagrams dropped because the received data length was less than the data length specified in the DDP header or the received data length was less than the length of the expected DDP header."

ddpTooLongErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION "The total number of input DDP datagrams dropped because the received data length was greater than the data length specified in the DDP header or because they exceeded the maximum DDP datagram size."

ddpBroadcastErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION "The total number of input DDP datagrams dropped because this entity was not their final destination and they were addressed to the link level broadcast."
ddpShortDDPErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of input DDP datagrams dropped because this entity was not their final destination and their type was short DDP."
 ::= { ddp 12 }

ddpHopCountErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of input DDP datagrams dropped because this entity was not their final destination and their hop count would exceed 15."
 ::= { ddp 13 }

ddpChecksumErrors OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The total number of input DDP datagrams dropped because of a checksum error."
 ::= { ddp 14 }

-- The RTMP Group

rtmpTable OBJECT-TYPE
SYNTAX SEQUENCE OF RtmpEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"A list of Routing Table Maintenance Protocol entries for this entity."
 ::= { rtmp 1 }

rtmpEntry OBJECT-TYPE
SYNTAX RtmpEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"The route entry to a particular network range."
INDEX { rtmpRangeStart }
RtmpEntry ::= SEQUENCE {
    rtmpRangeStart  OCTET STRING (SIZE(2)),
    rtmpRangeEnd    OCTET STRING (SIZE(2)),
    rtmpNextHop     OCTET STRING,
    rtmpType        INTEGER,
    rtmpPort        INTEGER,
    rtmpHops        INTEGER,
    rtmpState       INTEGER
}

rtmpRangeStart OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(2))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The first DDP network address in the network range to which this routing entry pertains. This is a two octet DDP network address in network byte order."
::= { rtmpEntry 1 }

rtmpRangeEnd OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(2))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The last DDP network address in the network range to which this routing entry pertains. This is a two octet DDP network address in network byte order. If the network to which this routing entry pertains is a Phase 1 network or a non-extended network, the value for rtmpRangeEnd shall be two octets of zero."
::= { rtmpEntry 2 }

rtmpNextHop OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The next hop in the route to this entry’s destination network. If the type of this route is Appletalk, this address takes the same form as DdpAddress."
::= { rtmpEntry 3 }
rtmpType OBJECT-TYPE
SYNTAX INTEGER {
    other(1),
    appletalk(2),
    serial-ppp(3),
    serial-nonstandard(4)
}
ACCESS read-write
STATUS mandatory
DESCRIPTION
    "The type of network over which this route points."
 ::= { rtmpEntry 4 }

rtmpPort OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-write
STATUS mandatory
DESCRIPTION
    "The index of the AppleTalk port over which this route points."
 ::= { rtmpEntry 5 }

rtmpHops OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-write
STATUS mandatory
DESCRIPTION
    "The number of hops required to reach the destination network to which
this routing entry pertains."
 ::= { rtmpEntry 6 }

rtmpState OBJECT-TYPE
SYNTAX INTEGER {
    good(1),
    suspect(2),
    goingBad(3),
    bad(4) -- may be removed from table
}
ACCESS read-write
STATUS mandatory
DESCRIPTION
    "The status of the information contained in this route entry.

    Setting this object to the value bad(4) has the effect of invalidating the corresponding entry
in the rtmpTable. That is, it effectively disassociates the mapping identified with said entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Accordingly, management stations must be prepared to receive from agents tabular information corresponding to entries not currently in use. Proper interpretation of such entries requires examination of the relevant rtmpState object.

```plaintext
::= { rtmpEntry 7 }

-- The KIP Group

kipTable OBJECT-TYPE
SYNTAX SEQUENCE OF KipEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"The table of routing information for KIP networks."
 ::= { kip 1 }

kipEntry OBJECT-TYPE
SYNTAX KipEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"An entry in the routing table for KIP networks."
INDEX { kipNetStart }
 ::= { kipTable 1 }

KipEntry ::= SEQUENCE {
  kipNetStart     OCTET STRING (SIZE(2)),
  kipNetEnd       OCTET STRING (SIZE(2)),
  kipNextHop      IpAddress,
  kipHopCount     INTEGER,
  kipBCastAddr    IpAddress,
  kipCore         INTEGER,
  kipType         INTEGER,
  kipState        INTEGER,
  kipShare        INTEGER
}

kipNetStart OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(2))
ACCESS read-write

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STATUS mandatory
DESCRIPTION
"The first AppleTalk network address in the range for this routing entry. This address is a two octet DDP network address in network byte order."
 ::= { kipEntry 1 }

kipNetEnd OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(2))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The last AppleTalk network address in the range for this routing entry. This address is a two octet DDP network address in network byte order. If the network to which this AppleTalk port is connected is a Phase 1 network or a non-extended network, the value for kipNetEnd shall be two octets of zero."
 ::= { kipEntry 2 }

kipNextHop OBJECT-TYPE
SYNTAX IpAddress
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The IP address of the next hop in the route to this entry’s destination network."
 ::= { kipEntry 3 }

kipHopCount OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The number of hops required to reach the destination network to which this entry pertains."
 ::= { kipEntry 4 }

kipBCastAddr OBJECT-TYPE
SYNTAX IpAddress
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The form of the IP address used to broadcast on this network."
 ::= { kipEntry 5 }
kipCore OBJECT-TYPE
SYNTAX INTEGER {
   core(1),
   notcore(2)
}
ACCESS read-write
STATUS mandatory
DESCRIPTION
   "The status of this network as a Kip Core network."
::= { kipEntry 6 }

kipType OBJECT-TYPE
SYNTAX INTEGER {
   kipRouter(1),
   net(2),
   host(3),
   other(4)
}
ACCESS read-write
STATUS mandatory
DESCRIPTION
   "The type of the entity that this route points to."
::= { kipEntry 7 }

kipState OBJECT-TYPE
SYNTAX INTEGER {
   configured(1),
   learned(2),
   invalid(3)
}
ACCESS read-write
STATUS mandatory
DESCRIPTION
   "The state of this network entry.

   Setting this object to the value invalid(3) has the effect of invalidating the corresponding entry in the kipTable. That is, it effectively disassociates the mapping identified with said entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Accordingly, management stations must be prepared to receive from agents tabular information corresponding to entries not currently in use. Proper interpretation of such
entries requires examination of the relevant kipState object.

::= { kipEntry 8 }

kipShare OBJECT-TYPE
SYNTAX INTEGER {
  shared(1),
  private(2)
}
ACCESS read-write
STATUS mandatory
DESCRIPTION
"If the information in this entry is propagated to other routers as part of a routing protocol, the value of this variable is equal to shared(1). Otherwise its value is private(2)."

::= { kipEntry 9 }

-- The ZIP Group

zipTable OBJECT-TYPE
SYNTAX SEQUENCE OF ZipEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"The table of zone information for reachable AppleTalk networks."

::= { zip 1 }

zipEntry OBJECT-TYPE
SYNTAX ZipEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"An entry of zone information for a particular zone and network combination."
INDEX { zipZoneNetStart, zipZoneIndex } 

::= { zipTable 1 }

ZipEntry ::= SEQUENCE {
  zipZoneName OCTET STRING,
  zipZoneIndex INTEGER,
  zipZoneNetStart OCTET STRING (SIZE(2)),
  zipZoneNetEnd OCTET STRING (SIZE(2)),
  zipZoneState INTEGER
}
zipZoneName OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The ASCII zone name of this entry."
::= { zipEntry 1 }

zipZoneIndex OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-only
STATUS mandatory
DESCRIPTION
"An integer that is unique to the zipZoneName that is present in this entry. For any given zone name, every zipEntry that has an equal zone name will have the same zipZoneIndex."
::= { zipEntry 2 }

zipZoneNetStart OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(2))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The network that starts the range for this entry. This address is a two octet DDP network address in network byte order."
::= { zipEntry 3 }

zipZoneNetEnd OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(2))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The network that ends the range for this entry. This address is a two octet DDP network address in network byte order. If the network to which this zip entry pertains is a Phase 1 network or a non-extended network, the value for zipZoneNetEnd shall be two bytes of zero."
::= { zipEntry 4 }

zipZoneState OBJECT-TYPE
SYNTAX INTEGER {
    valid(1),
    invalid(2)
}
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The state of this zip entry.

Setting this object to the value invalid(2) has the effect of invalidating the corresponding entry in the zipTable. That is, it effectively disassociates the mapping identified with said entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Accordingly, management stations must be prepared to receive from agents tabular information corresponding to entries not currently in use. Proper interpretation of such entries requires examination of the relevant zipZoneState object."
 ::= { zipEntry 5 }

-- The NBP Group

nbpTable OBJECT-TYPE
SYNTAX SEQUENCE OF NbpEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"The table of NBP services registered on this entity."
 ::= { nbp 1 }

NbpEntry ::= SEQUENCE {
 nbpIndex INTEGER,
 nbpObject OCTET STRING,
 nbpType OCTET STRING,
 nbpZone OCTET STRING,
 nbpState INTEGER
}

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nbpIndex OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The index of this NBP entry. This value ranges from 1 to the number of NBP entries currently registered on this entity."
 ::= { nbpEntry 1 }

nbpObject OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The name of the service described by this entity."
 ::= { nbpEntry 2 }

nbpType OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The type of the service described by this entity."
 ::= { nbpEntry 3 }

nbpZone OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The zone the service described by this entity is registered in."
 ::= { nbpEntry 4 }

nbpState OBJECT-TYPE
SYNTAX INTEGER {
  valid(1),
  invalid(2)
}
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The state of this NBP entry.

Setting this object to the value invalid(2) has
the effect of invalidating the corresponding entry in the nbpTable. That is, it effectively disassociates the mapping identified with said entry. It is an implementation-specific matter as to whether the agent removes an invalidated entry from the table. Accordingly, management stations must be prepared to receive from agents tabular information corresponding to entries not currently in use. Proper interpretation of such entries requires examination of the relevant nbpState object.

::= { nbpEntry 5 }

-- The ATEcho Group

atechoRequests OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The number of AppleTalk echo requests received."
::= { atecho 1 }

atechoReplies OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The number of AppleTalk echo replies sent."
::= { atecho 2 }

END

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7. References


Security Considerations

Security issues are not discussed in this memo.

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