Definition of Managed Objects for the DYMO Manet Routing Protocol
draft-ietf-manet-dymo-mib-04

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 objects for configuring aspects of the DYMO routing process. The DYMO-MIB also reports state information, performance information, and notifications. In addition to configuration, this additional state, performance and notification information is useful to management operators troubleshooting DYMO routing problems.

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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 objects for configuring aspects of a Dynamic MANET On-demand (DYMO) routing \[I-D.ietf-manet-dymo] process. The DYMO-MIB also reports state information, performance metrics, and notifications. In addition to configuration, this additional state, performance and notification information is useful to management stations troubleshooting routing problems.

2. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to section 7 of RFC 3410 [RFC3410].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIv2, which is described in STD 58, RFC 2578 [RFC2578], STD 58, RFC 2579 [RFC2579] and STD 58, RFC 2580 [RFC2580].

3. Conventions

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 [RFC2119].

4. Overview

The Dynamic MANET On-demand (DYMO) routing protocol \[I-D.ietf-manet-dymo] is intended for use by mobile nodes in wireless, multihop networks. DYMO determines unicast routes among DYMO routers within the network in an on-demand fashion, offering improved convergence in dynamic topologies.

A DYMO router’s MIB contains DYMO process configuration parameters (e.g. interfaces), state information (e.g. sequence number), performance counters (e.g. number of control messages), and notifications.
4.1. DYMO Management Model

This section describes the management model for the DYMO routing protocol.

The MIB is comprised of four groups, i.e., Notifications, Configuration, State and Performance. The configuration of the managed devices is controlled by the objects in the Configuration Group. These are divided into Nodal and Interface objects. The bulk of the DYMO configuration is in the Nodal objects which control protocol behavior. The Interface objects merely identify/configure interfaces to enable DYMO routing over their interface. The Nodal objects are further divided into routing (or protocol) objects and Gateway objects. Gateway objects define other routing prefixes for which the node acts as a routing proxy on behalf of these non-local prefixes.

The Configuration Objects drive the behavior of the managed DYMO device and hence determines the information in the remaining groups, i.e., State, Performance and Notifications. The State objects primarily present the resulting forwarding table objects. The Performance group primarily is comprised of counters for monitoring the number of DYMO routing messages received locally, per node and per interface. The Notifications group contains objects which monitor changes to the interface configuration and the gateway prefixes configuration.

See the below diagram outlining the DYMO-MIB device management model.
4.2. Terms

The following definitions apply throughout this document:

- **Configuration Objects** - switches, tables, objects which are initialized to default settings or set through the management interface defined by this MIB.

- **Tunable Configuration Objects** - objects whose values affect timing or attempt bounds on the DYMO protocol.

- **State Objects** - automatically generated values which define the current operating state of the DYMO protocol process in the router.

- **Performance Objects** - automatically generated values which help an operator or automated tool to assess the performance of the DYMO protocol process on the router and the overall routing performance within the DYMO routing domain.

5. Structure of the MIB Module

This section presents the structure of the DYMO MIB module. The objects are arranged into the following groups:

- **dymoMIBNotifications** - defines the notifications associated with the DYMO-MIB. These are currently limited to notifications of interface state changes and gateway prefix changes.
o dymoMIBObjects - defines the objects forming the basis for the DYMO-MIB. These objects are divided up by function into the following groups:

- Configuration Group - This group contains the DYMO objects that configure specific options that determine the overall performance and operation of the routing protocol for the router device and its interfaces.

- State Group - Contains information describing the current state of the DYMO process such as the DYMO routing table.

- Performance Group - Contains objects which help to characterize the performance of the DYMO process, typically statistics counters. There are two types of DYMO statistics: global counters and per interface counters.

o dymoMIBConformance - defines minimal and full conformance of implementations to this DYMO-MIB.

5.1. Textual Conventions

The textual conventions used in the DYMO-MIB are as follows. The RowStatus and TruthValue textual conventions are imported from RFC 2579 [RFC2579]. The DymoInterfaceOperStatus is defined within the DYMO-MIB. This contains the current operational status of the DYMO interface.

5.2. The Configuration Group

The DYMO device is configured with a set of controls. The list of configuration controls for the DYMO device follow.

Protocol Configuration Parameters:

- DID

- MSG_HOPLIMIT

- ROUTE_TIMEOUT

- ROUTE_AGE_MIN_TIMEOUT

- ROUTE_SEQNUM_AGE_MAX_TIMEOUT
5.3. The State Group

The State Subtree reports current state information. State information from the DYMO-MIB is primarily contained in the 'Routing' Table.

5.3.1. Routing Table

The DYMO routing table contains information related to IP forwarding entries found by the node’s DYMO processes.

5.4. The Performance Group

The Performance subtree reports primarily counters that relate to DYMO protocol activity. The DYMO performance objects consists of per node and per interface objects:

- OwnSequenceNumber
- RREQ initiated
- RREQ sent
- RREQ received
5.5. The Notifications Group

The Notifications Subtree contains the list of notifications supported within the DYMO-MIB and their intended purpose or utility. This group is currently contains two notification objects, one related to status changes in DYMO interfaces and one related to changes in the gateway prefixes table.

6. Relationship to Other MIB Modules

The text of this section specifies the relationship of the MIB modules contained in this document to other standards, particularly to standards containing other MIB modules. Definitions imported from other MIB modules and other MIB modules that SHOULD be implemented in
conjunction with the MIB module contained within this document are identified in this section.

6.1. Relationship to the SNMPv2-MIB

The 'system' group in the SNMPv2-MIB [RFC3418] is defined as being mandatory for all systems, and the objects apply to the entity as a whole. The 'system' group provides identification of the management entity and certain other system-wide data. The DYMO-MIB does not duplicate those objects.

6.2. MIB modules required for IMPORTS

The DYMO-MIB module IMPORTS objects from SNMPv2-SMI [RFC2578], SNMPv2-TC [RFC2579], SNMPv2-CONF [RFC2580], INET-ADDRESS-MIB [RFC4001] and IF-MIB [RFC2863].

7. Definitions

MANET-DYMO-MIB DEFINITIONS ::= BEGIN

IMPORTS

    MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE, Counter32, Integer32, Unsigned32, mib-2
    FROM SNMPv2-SMI                          -- [RFC2578]

    TEXTUAL-CONVENTION, RowStatus, TruthValue
    FROM SNMPv2-TC                           -- [RFC2579]

    MODULE-COMPLIANCE, OBJECT-GROUP,
    NOTIFICATION-GROUP
    FROM SNMPv2-CONF                         -- [RFC2580]

    InetAddress, InetAddressType,
    InetAddressPrefixLength
    FROM INET-ADDRESS-MIB                    -- [RFC4001]

    InterfaceIndexOrZero
    FROM IF-MIB                              -- [RFC2863]

;

manetDymoMIB MODULE-IDENTITY
    LAST-UPDATED "201101191200Z" -- January 19, 2011
    ORGANIZATION "IETF MANET Working Group"
    CONTACT-INFO
        "WG E-Mail: manet@ietf.org"
DESCRIPTION


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-- Revision History

REVISION "201101191200Z" -- January 19, 2011

DESCRIPTION

"Fifth draft of this MIB module published as draft-ietf-manet-dymo-mib-04.txt.

Changes include:
- Incorporated the DYMO ID by adding Instance Table.
- Added dymoSetNotification for improved control of DYMO Notifications."
- Updated various object names to be consistent with current draft-ietf-manet-dymo-21.

REVISION    "200910251200Z"   -- October 25, 2009
DESCRIPTION
"Fourth draft of this MIB module published as draft-ietf-manet-dymo-mib-03.txt.  
- Minor changes to textual material, including additions to the IMPORTS text.
- Added DEFVAL clauses to all read-write configuration objects with defaults identified in the DYMO draft."

REVISION    "200902241200Z"   -- February 24, 2009
DESCRIPTION
"Third draft of this MIB module published as draft-ietf-manet-dymo-mib-02.txt.  
- Minor changes to dymoInterfacesTable and dymoResponsibleAddrTable.
- Added global dymoAdminStatus and interface specific dymoIfAdminStatus.  
- Imported InterfaceIndexOrZero type from IF-MIB."

REVISION    "200811031200Z"   -- November 03, 2008
DESCRIPTION
"Second draft of this MIB module published as draft-ietf-manet-dymo-mib-01.txt.  Minor changes to dymoInterfacesTable and dymoResponsibleAddrTable."

REVISION    "200805141200Z"   -- May 14, 2008
DESCRIPTION
"Initial draft of this MIB module published as draft-ietf-manet-dymo-mib-00.txt."

-- RFC-Editor assigns XXXX
::= { mib-2 999 }   -- to be assigned by IANA

--
-- TEXTUAL CONVENTIONS
--

Status ::= TEXTUAL-CONVENTION
STATUS    current
DESCRIPTION
"An indication of the operability of a DYMO function or feature.  For example, the status of an interface: 'enabled' indicates that it is willing to communicate with other DYMO routers, and 'disabled' indicates that it is not."
SYNTAX  INTEGER { enabled (1), disabled (2) }
-- Top-Level Object Identifier Assignments
--
dymoMIBNotifications OBJECT IDENTIFIER ::= { manetDymoMIB 0 }
dymoMIBObjects OBJECT IDENTIFIER ::= { manetDymoMIB 1 }
dymoMIBConformance OBJECT IDENTIFIER ::= { manetDymoMIB 2 }

--
-- dymoConfigurationGroup
--
-- This group contains the DYMO objects that configure specific
-- options that determine the overall performance and operation
-- of the routing protocol for the router device and its
-- interfaces.
--
dymoConfigurationGroup OBJECT IDENTIFIER ::= { dymoMIBObjects 1 }

--
-- DYMO Global Router Configuration Group
--

dymoRouterConfigGroup OBJECT IDENTIFIER ::= {dymoConfigurationGroup 1}

dymoInstanceTable OBJECT-TYPE
SYNTAX       SEQUENCE OF DymoInstanceEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The DYMO Instance Table describes the DYMO
 ...."
REFERENCE
 "Dynamic MANET On-demand (DYMO) Routing, Chakeres,
 I., and C. Perkins, July 2010. The DID."
 ::= { dymoRouterConfigGroup 1 }

dymoInstanceEntry OBJECT-TYPE
SYNTAX       DymoInstanceEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The DYMO instance entry describes one DYMO
 process as indexed by its DID."
INDEX { dymoInstanceIndex }
 ::= { dymoInstanceTable 1 }

DymoInstanceEntry ::=

SEQUENCE {
  dymoInstanceIndex
    Integer32,
  dymoInstanceDid
    Integer32,
  dymoInstanceAdminStatus
    Status,
  dymoInstanceRowStatus
    RowStatus
}

dymoInstanceIndex  OBJECT-TYPE
SYNTAX      Integer32 (0..255)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "The instance index for this DYMO process."
::= { dymoInstanceEntry 1 }

dymoInstanceDid OBJECT-TYPE
SYNTAX       Integer32 (0..255)
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
  "The DYMO ID of this instance of the
  DYMO process."
::= { dymoInstanceEntry 2 }

dymoInstanceAdminStatus OBJECT-TYPE
SYNTAX       Status
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION
  "The administrative status of this DYMO
  process in the router. Multiple processes are
  allowed. The value ‘enabled’ denotes that the
  DYMO Process is active on at least one interface;
  ‘disabled’ disables it on all interfaces.

  This object is persistent and when written
  the entity SHOULD save the change to non-volatile storage."
::= { dymoInstanceEntry 3 }

dymoInstanceRowStatus  OBJECT-TYPE
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"This object permits management of the table by facilitating actions such as row creation, construction, and destruction. The value of this object has no effect on whether other objects in this conceptual row can be modified."
::= { dymoInstanceEntry 4 }

dymoMaxHopLimit OBJECT-TYPE
SYNTAX Unsigned32 (0..255)
UNITS "hops"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The maximum number of hops. The suggested default is 10 hops. This is the DYMO MSG_HOPLIMIT parameter value."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 2 Suggested Parameter Values."
DEFVAL { 10 }
 ::= { dymoRouterConfigGroup 2 }

dymoRouteTimeout OBJECT-TYPE
SYNTAX Unsigned32 (1..65535)
UNITS "milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The route timeout value. The suggested default value is 5000 milliseconds. This is the DYMO ROUTE_TIMEOUT parameter value."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 2 Suggested Parameter Values."
DEFVAL { 5000 }
 ::= { dymoRouterConfigGroup 3 }

dymoRouteAgeMinTimeout OBJECT-TYPE
SYNTAX Unsigned32 (1..65535)
UNITS "milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The minimum route age timeout value. The
suggested default value is 1000 milliseconds.
This is the DYMO ROUTE_AGE_MIN_TIMEOUT parameter value."

REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 2 Suggested Parameter Values."
DEFVAL { 1000 }
 ::= { dymoRouterConfigGroup 4 }

dymoRouteSeqnumAgeMaxTimeout OBJECT-TYPE
SYNTAX Unsigned32 (1..65535)
UNITS "milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The maximum route age timeout value. The suggested default value is 60,000 milliseconds. This is the DYMO ROUTE_SEQNUM_AGE_MAX_TIMEOUT parameter value."

REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 2 Suggested Parameter Values."
DEFVAL { 60000 }
 ::= { dymoRouterConfigGroup 5 }

dymoRouteUsedTimeout OBJECT-TYPE
SYNTAX Unsigned32 (1..65535)
UNITS "milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The route used timeout value. The suggested default value is to set this to the dymoRouteTimeout object value (whose default is 5000 milliseconds). This is the DYMO ROUTE_USED_TIMEOUT parameter value."

REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 2 Suggested Parameter Values."
DEFVAL { 5000 }
 ::= { dymoRouterConfigGroup 6 }

dymoRouteDeleteTimeout OBJECT-TYPE
SYNTAX Unsigned32 (1..65535)
UNITS "milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The route delete timeout value. The suggested default value is 2 * dymoRouteTimeout value (which is equal to 10000 milliseconds if using the default value for the dymoRouteTimeout value). This is the DYMO ROUTE_DELETE_TIMEOUT parameter value."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 2 Suggested Parameter Values."
DEFVAL { 10000 }
 ::= { dymoRouterConfigGroup 7 }
dymoRouteRreqWaitTime OBJECT-TYPE
SYNTAX Unsigned32 (1..65535)
UNITS "milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The Route Request wait time. The suggested default value is 2000 milliseconds. This is the DYMO ROUTE_RREQ_WAIT_TIME parameter value."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 2 Suggested Parameter Values."
DEFVAL { 2000 }
 ::= { dymoRouterConfigGroup 8 }
dymoDiscoveryAttemptsMax OBJECT-TYPE
SYNTAX Unsigned32 (1..16)
UNITS "attempts"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The number of Route Request retry attempts. The suggested default value is 3. This is the DYMO DISCOVERY_ATTEMPTS_MAX parameter value."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 2 Suggested Parameter Values."
DEFVAL { 3 }
 ::= { dymoRouterConfigGroup 9 }
dymoUnicastMsgSentTimeout  OBJECT-TYPE
SYNTAX Unsigned32 (1..65535)
UNITS "milliseconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The message sent timeout value for unicast packets. The suggested default value is 1000 milliseconds. This is the DYMO UNICAST_MESSAGE_SENT_TIMEOUT parameter value."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 2 Suggested Parameter Values."
DEFVAL { 1000 }
::= { dymoRouterConfigGroup 10 }

--
-- DYMO Interfaces Configuration Table
--

dymoInterfaceTable  OBJECT-TYPE
SYNTAX SEQUENCE OF DymoInterfaceEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The DYMO Interface Table describes the DYMO interfaces that are participating in the DYMO routing protocol. The ifIndex is from the interfaces group defined in the Interfaces Group MIB."
REFERENCE
"RFC 2863 - The Interfaces Group MIB, McCloghrie, K., and F. Kastenholtz, June 2000."
::= { dymoConfigurationGroup 2 }
dymoInterfaceEntry OBJECT-TYPE
SYNTAX DymoInterfaceEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The DYMO interface entry describes one DYMO interface as indexed by its ifIndex."
INDEX { dymoIfIndex }
::= { dymoInterfaceTable 1 }
DymoInterfaceEntry ::=  
SEQUENCE {  
dymoIfIndex  
   InterfaceIndexOrZero,  
dymoIfAdminStatus  
   Status,  
dymoIfRowStatus  
   RowStatus  
 }

dymoIfIndex OBJECT-TYPE
SYNTAX InterfaceIndexOrZero
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The ifIndex for this DYMO interface."
::= { dymoInterfaceEntry 1 }

dymoIfAdminStatus OBJECT-TYPE
SYNTAX Status
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The DYMO interface’s administrative status.  
The value ‘enabled’ denotes that the interface 
is running the DYMO routing protocol.  
The value ‘disabled’ denotes that the interface is 
external to DYMO."
::= { dymoInterfaceEntry 2 }

dymoIfRowStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object permits management of the table 
by facilitating actions such as row creation, 
construction, and destruction. The value of 
this object has no effect on whether other 
objects in this conceptual row can be 
modified."
::= { dymoInterfaceEntry 3 }

--

-- DYMO Responsible Address Table
--
dymoResponsibleAddrTable OBJECT-TYPE
SYNTAX     SEQUENCE OF DymoResponsibleAddrEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"The DYMO Responsible Address Table is a list of IP address prefixes, and their associated prefix length for which the DYMO router is responsible."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 3 Important Settings."
::= { dymoConfigurationGroup 3 }

DymoResponsibleAddrEntry OBJECT-TYPE
SYNTAX     DymoResponsibleAddrEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"A single host address range. Information in this table is persistent and when this object is written, the entity SHOULD save the change to non-volatile storage."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 3 Important Settings."
INDEX { dymoResponsibleAddrIndex }
::= { dymoResponsibleAddrTable 1 }

DymoResponsibleAddrEntry ::= SEQUENCE {
    dymoResponsibleAddrIndex  Unsigned32,
    dymoResponsibleAddrType   InetAddrType,
    dymoResponsibleAddr       InetAddress,
    dymoResponsibleAddrPrefixLen  InetAddressPrefixLength,
    dymoResponsibleAddrRowStatus  RowStatus
}

DymoResponsibleAddrIndex OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS not-accessible
dymoResponsibleAddrType  OBJECT-TYPE
SYNTAX      InetAddressType
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"The type of the dymoResponsibleAddr, as defined in the InetAddress MIB [RFC 4001]."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 3 Important Settings."
::= { dymoResponsibleAddrEntry 2 }

dymoResponsibleAddr  OBJECT-TYPE
SYNTAX      InetAddress
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"The destination IP address of this route. The type of this address is determined by the value of the dymoResponsibleAddrType object."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 3 Important Settings."
::= { dymoResponsibleAddrEntry 3 }

dymoResponsibleAddrPrefixLen  OBJECT-TYPE
SYNTAX      InetAddressPrefixLength
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
"Indicates the number of leading one bits that form the mask to be logical-AND’d with the destination address before being compared to the value in the dymoResponsibleAddr field."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 3 Important Settings."
::= { dymoResponsibleAddrEntry 4 }

dymoResponsibleAddrRowStatus  OBJECT-TYPE
SYNTAX       RowStatus  
MAX-ACCESS   read-create 
STATUS       current 
DESCRIPTION
 "This object permits management of the table by facilitating actions such as row creation, construction, and destruction. The value of this object has no effect on whether other objects in this conceptual row can be modified." 
::= { dymoResponsibleAddrEntry 5 }

--
--  dymoStateGroup
--
--  Contains information describing the current state of the DYMO process such as the DYMO routing table.
--

dymoStateGroup   OBJECT IDENTIFIER ::= { dymoMIBObjects 2 }

dymoCurrentSeqNum OBJECT-TYPE
SYNTAX      Unsigned32 (1..65535)
MAX-ACCESS  read-only 
STATUS      current 
DESCRIPTION 
"The current DYMO sequence number. The DYMO sequence numbers allow nodes to judge the freshness of routing information and ensures loop freedom. If the sequence number has been assigned to be the largest possible number representable as a 16-bit unsigned integer (i.e., 65,535), then the sequence number is set to 256 when incremented. Setting the sequence number to 256 allows other nodes to detect that the number has rolled over and the node has not lost its sequence number (e.g., via reboot)."
::= { dymoStateGroup 1 }

--
--  DYMO Routing Table
--

dymoRoutingTable OBJECT-TYPE
SYNTAX       SEQUENCE OF DymoRoutingEntry
MAX-ACCESS   not-accessible 
STATUS      current 
DESCRIPTION

"The DYMO Routing Table describes the current routing information learned via DYMO control messages."

REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 2 Suggested Parameter Values."
 ::= { dymoStateGroup 2 }

dymoRoutingEntry OBJECT-TYPE
SYNTAX       DymoRoutingEntry
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION
"The DYMO routing entry contains a piece of routing information for a particular set of addresses."
INDEX { dymoRoutingIpAddrType,
           dymoRoutingIpAddr,
           dymoRoutingPrefixLen }
 ::= { dymoRoutingTable 1 }

DymoRoutingEntry ::==
SEQUENCE {
   dymoRoutingIpAddrType
   InetAddressType,
   dymoRoutingIpAddr
   InetAddress,
   dymoRoutingPrefixLen
   InetAddressPrefixLength,
   dymoRoutingSeqNum
   Unsigned32,
   dymoRoutingNextHopIpAddrType
   InetAddressType,
   dymoRoutingNextHopIpAddress
   InetAddress,
   dymoRoutingNextHopInterface
   InterfaceIndexOrZero,
   dymoRoutingForwardingFlag
   TruthValue,
   dymoRoutingBrokenFlag
   TruthValue,
   dymoRoutingDist
   Unsigned32
}

dymoRoutingIpAddrType  OBJECT-TYPE
SYNTAX      InetAddressType
dymoRoutingIpAddr  OBJECT-TYPE
SYNTAX      InetAddress
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The routing table Inet IPv4 or IPv6 address."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 3 Important Settings."
::= { dymoRoutingEntry 2 }

dymoRoutingPrefixLen  OBJECT-TYPE
SYNTAX      InetAddressPrefixLength
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The prefix length. This is a decimal value that indicates the number of contiguous, higher-order bits of the address that make up the network portion of the address."
REFERENCE
"Dynamic MANET On-demand (DYMO) Routing, Chakeres, I., and C. Perkins, July 2010. Table 3 Important Settings."
::= { dymoRoutingEntry 3 }

dymoRoutingSeqNum  OBJECT-TYPE
SYNTAX      Unsigned32 (1..65535)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The interface sequence number. This is the DYMO SeqNum associated with this routing information."
::= { dymoRoutingEntry 4 }

dymoRoutingNextHopIpAddrType OBJECT-TYPE
SYNTAX      InetAddressType
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The IP address type of the next hop."
::= { dymoRoutingEntry 5 }

dymoRoutingNextHopIpAddress OBJECT-TYPE
SYNTAX      InetAddress
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The IP address of the next hop."
::= { dymoRoutingEntry 6 }

dymoRoutingNextHopInterface OBJECT-TYPE
SYNTAX      InterfaceIndexOrZero
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The interface ifIndex for sending
packets toward the destination route
address."
::= { dymoRoutingEntry 7 }

dymoRoutingForwardingFlag OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The Forwarding Flag indicates whether
this route can be used for forwarding
data packets. A value 'true(1)'
indicates that this route is being used
for forwarding of data packets, while
a value 'false(2)' indicates that it is
not being used for forwarding."
::= { dymoRoutingEntry 8 }

dymoRoutingBrokenFlag OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The Broken Flag indicates whether
this Route is broken. This flag is set
if the next-hop becomes unreachable or
in response to processing a RERR. A value
'true(1)' indicates that this route is
broken, while a value 'false(2)'
indicates that it is not broken.
::= { dymoRoutingEntry 9 }

dymoRoutingDist OBJECT-TYPE
SYNTAX       Unsigned32 (0..65535)
UNITS        "hops"
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
"The distance to the destination address’s
DYMO router. This is a metric of the
distance a message or piece of information
has traversed. The minimum value of distance
is the number of IP hops traversed. The
maximum value is 65,535.

This parameter is an optional field in the
DYMO routing table. If the DYMO Route.Dist
is not supported by this device, then this
object should be set to ‘0’.
"
REFERENCES
"Dynamic MANET On-demand (DYMO) Routing,
Chakeres, I., and C. Perkins, April
2008. Section 3 Terminology."
::= { dymoRoutingEntry 10 }
dymoRreqForwarded  OBJECT-TYPE
  SYNTAX      Counter32
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "A counter of the number of RREQ messages that this DYMO device has forwarded, i.e., this device neither originated or terminated the RREQ message."
  ::= { dymoGlobalPerfGroup 2 }

dymoRreqReceived  OBJECT-TYPE
  SYNTAX      Counter32
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "A counter of the number of RREQ messages that this DYMO device has received as the target of the message."
  ::= { dymoGlobalPerfGroup 3 }

dymoRrepOriginated  OBJECT-TYPE
  SYNTAX      Counter32
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "A counter of the number of RREP messages that this DYMO device has initiated."
  ::= { dymoGlobalPerfGroup 4 }

dymoRrepForwarded  OBJECT-TYPE
  SYNTAX      Counter32
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "A counter of the number of RREP messages that this DYMO device has forwarded, i.e, this
device neither originated or
terminated the RREP message."
 ::= { dymoGlobalPerfGroup 5 }

dymoRrepReceived OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"A counter of the number of
RREP messages that this DYMO
device has received as the
target of the message."
 ::= { dymoGlobalPerfGroup 6 }

dymoRrerOriginated OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"A counter of the number of
RRER messages that this DYMO
device has initiated."  
 ::= { dymoGlobalPerfGroup 7 }

dymoRrerForwarded OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"A counter of the number of
RRER messages that this DYMO
device has forwarded, i.e., this
device neither originated or
terminated the RRER message."
 ::= { dymoGlobalPerfGroup 8 }

dymoRrerReceived OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"A counter of the number of
RRER messages that this DYMO
device has received as the
target of the message."
 ::= { dymoGlobalPerfGroup 9 }
dymoInterfacePerfGroup OBJECT IDENTIFIER ::= {dymoPerformanceGroup 2}

dymoInterfacePerfTable OBJECT-TYPE
SYNTAX      SEQUENCE OF DymoInterfacePerfEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"The DYMO Interface Performance Table describes the DYMO statistics per interface."
 ::= { dymoInterfacePerfTable 1 }

dymoInterfacePerfEntry OBJECT-TYPE
SYNTAX      DymoInterfacePerfEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  
"The DYMO Interface Performance entry describes the statistics for a particular Dymo interface."
INDEX { dymoIfPerfIfIndex }
 ::= { dymoInterfacePerfTable 1 }

DymoInterfacePerfEntry ::= 
SEQUENCE {
   dymoIfPerfIfIndex
        InterfaceIndexOrZero,
   dymoIfRreqOriginated
        Counter32,
   dymoIfRreqForwarded
        Counter32,
   dymoIfRreqReceived
        Counter32,
   dymoIfRrepOriginated
        Counter32,
   dymoIfRrepForwarded
        Counter32,
   dymoIfRrepReceived
        Counter32,
   dymoIfRrerOriginated
        Counter32,
   dymoIfRrerForwarded
        Counter32,
   dymoIfRrerReceived
        Counter32,
   dymoIfRrerRecei
Counter32

dymoIfPerfIfIndex OBJECT-TYPE
SYNTAX InterfaceIndexOrZero
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
 "The ifIndex for this DYMO interface
  that is collecting this set of
  performance management statistics."
::= { dymoInterfacePerfEntry 1 }

dymoIfRreqOriginated OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "A counter of the number of
  RREQ messages that this DYMO
  interface has initiated."
::= { dymoInterfacePerfEntry 2 }

dymoIfRreqForwarded OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "A counter of the number of
  RREQ messages that this DYMO
  interface has forwarded, i.e., this
  interface neither originated nor
  terminated the RREQ message."
::= { dymoInterfacePerfEntry 3 }

dymoIfRreqReceived OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
 "A counter of the number of
  RREQ messages that this DYMO
  interface has received as the
  target of the message."
::= { dymoInterfacePerfEntry 4 }

dymoIfRrepOriginated OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION   "A counter of the number of
RREP messages that this DYMO
interface has initiated."
::= { dymoInterfacePerfEntry 5 }

dymoIfRrepForwarded  OBJECT-TYPE
SYNTAX           Counter32
MAX-ACCESS       read-only
STATUS           current
DESCRIPTION      "A counter of the number of
RREP messages that this DYMO
interface has forwarded, i.e., this
interface neither originated nor
terminated the RREP message."
::= { dymoInterfacePerfEntry 6 }

dymoIfRrepReceived  OBJECT-TYPE
SYNTAX            Counter32
MAX-ACCESS        read-only
STATUS            current
DESCRIPTION       "A counter of the number of
RREP messages that this DYMO
interface has received as the
target of the message."
::= { dymoInterfacePerfEntry 7 }

dymoIfRrerOriginated  OBJECT-TYPE
SYNTAX            Counter32
MAX-ACCESS        read-only
STATUS            current
DESCRIPTION       "A counter of the number of
RRER messages that this DYMO
interface has initiated."
::= { dymoInterfacePerfEntry 8 }

dymoIfRrerForwarded  OBJECT-TYPE
SYNTAX            Counter32
MAX-ACCESS        read-only
STATUS            current
DESCRIPTION       "A counter of the number of
RRER messages that this DYMO
interface has forwarded, i.e., this interface neither originated nor terminated the RRER message.

::= { dymoInterfacePerfEntry 9 }

dymoIfRrerReceived OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "A counter of the number of RRER messages that this DYMO interface has received as the target of the message."

::= { dymoInterfacePerfEntry 10 }

-- Notifications

--

-- Notifications


dymoMIBNotifControl OBJECT IDENTIFIER ::= { dymoMIBNotifications 1 }
dymoMIBNotifObjects OBJECT IDENTIFIER ::= { dymoMIBNotifications 2 }

-- dymoMIBNotifControl

dymoSetNotification OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(4))
MAX-ACCESS read-write
STATUS current
DESCRIPTION "A 4-octet string serving as a bit map for the notification events defined by the DYMO notifications. This object is used to enable and disable specific DYMO notifications where a 1 in the bit field represents enabled. The right-most bit (least significant) represents notification 0.

This object is persistent and when written the entity SHOULD save the change to non-volatile storage.
"

::= { dymoMIBNotifControl 1 }
-- dymoMIBNotifObjects

dymoInstanceAdminStatusChange  NOTIFICATION-TYPE
  OBJECTS     { dymoInstanceAdminStatus,
                 dymoInstanceDid }
  STATUS      current
  DESCRIPTION
                "This notification is generated when the
                administrative status of a DYMO process changes."
  ::= { dymoMIBNotifObjects 1 }

dymoInterfaceAdminStatusChange  NOTIFICATION-TYPE
  OBJECTS     { dymoIfAdminStatus }
  STATUS      current
  DESCRIPTION
                "This notification is generated when the
                administrative status of a DYMO interface changes."
  ::= { dymoMIBNotifObjects 2 }

dymoResponsibleAddrEntryChange  NOTIFICATION-TYPE
  OBJECTS     { dymoResponsibleAddrRowStatus }
  STATUS      current
  DESCRIPTION
                "This notification is generated when the status
                of an entry in the DYMO Responsible Address
                Table changes. This includes the creation or
                deletion of a row."
  ::= { dymoMIBNotifObjects 3 }

--
-- Compliance Statements
--

dymoCompliances  OBJECT IDENTIFIER ::= { dymoMIBConformance 1 }
dymoMIBGroups    OBJECT IDENTIFIER ::= { dymoMIBConformance 2 }

dymoBasicCompliance  MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION "The basic implementation requirements for
               managed network entities that implement
               the DYMO routing protocol."
  MODULE -- this module
  MANDATORY-GROUPS { dymoConfigObjectsGroup }
  ::= { dymoCompliances 1 }

dymoFullCompliance  MODULE-COMPLIANCE
  STATUS current
DESCRIPTION "The full implementation requirements for managed
network entities that implement the DYMO routing
protocol."

MODULE -- this module
MANDATORY-GROUPS { dymoConfigObjectsGroup,
dymoStateObjectsGroup,
dymoPerfObjectsGroup,
dymoNotifObjectsGroup,
dymoNotificationGroup }
 ::= { dymoCompliances 2 }

--
-- Units of Conformance
--
dymoConfigObjectsGroup OBJECT-GROUP
 OBJECTS {
 dymoInstanceAdminStatus,
dymoInstanceDid,
dymoInstanceRowStatus,
dymoMaxHopLimit,
dymoRouteTimeout,
dymoRouteAgeMinTimeout,
dymoRouteSeqnumAgeMaxTimeout,
dymoRouteUsedTimeout,
dymoRouteDeleteTimeout,
dymoRouteRreqWaitTime,
dymoDiscoveryAttemptsMax,
dymoUnicastMsgSentTimeout,
dymoIfAdminStatus,
dymoIfRowStatus,
dymoResponsibleAddrType,
dymoResponsibleAddr,
dymoResponsibleAddrPrefixLen,
dymoResponsibleAddrRowStatus
 }
 STATUS current
DESCRIPTION
"Set of DYMO configuration objects implemented
in this module."
 ::= { dymoMIBGroups 1 }
dymoStateObjectsGroup OBJECT-GROUP
 OBJECTS {
 dymoCurrentSeqNum,
dymoRoutingSeqNum,
dymoRoutingNextHopIpAddrType,
dymoRoutingNextHopIpAddress,
dymoRoutingNextHopInterface,
dymoRoutingForwardingFlag,
dymoRoutingBrokenFlag,
dymoRoutingDist
)
STATUS current
DESCRIPTION "Set of DYMO state objects implemented
   in this module."
 ::= { dymoMIBGroups 2 }

dymoPerfObjectsGroup OBJECT-GROUP
OBJECTS {
   dymoRreqOriginated,
dymoRreqForwarded,
dymoRreqReceived,
dymoRrepOriginated,
dymoRrepForwarded,
dymoRrepReceived,
dymoRrerOriginated,
dymoRrerForwarded,
dymoRrerReceived,
dymoIfRreqOriginated,
dymoIfRreqForwarded,
dymoIfRreqReceived,
dymoIfRrepOriginated,
dymoIfRrepForwarded,
dymoIfRrepReceived,
dymoIfRrerOriginated,
dymoIfRrerForwarded,
dymoIfRrerReceived
}
STATUS current
DESCRIPTION "Set of DYMO statistic objects implemented
   in this module for performance management."
 ::= { dymoMIBGroups 3 }

dymoNotifObjectsGroup OBJECT-GROUP
OBJECTS {
   dymoSetNotification
}
STATUS current
DESCRIPTION "Set of DYMO notifications objects implemented
   in this module."
 ::= { dymoMIBGroups 4 }
dymoNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS {
        dymoInstanceAdminStatusChange,
        dymoInterfaceAdminStatusChange,
        dymoResponsibleAddrEntryChange
    }
STATUS current
DESCRIPTION
    "Set of DYMO notifications implemented in this
    module."
::= { dymoMIBGroups 5 }
END

8. Security Considerations

[TODO] Each specification that defines one or more MIB modules MUST
contain a section that discusses security considerations relevant to
those modules. This section MUST be patterned after the latest
approved template (available at
http://www.ops.ietf.org/mib-security.html). Remember that the
objective is not to blindly copy text from the template, but rather
to think and evaluate the risks/vulnerabilities and then state/
document the result of this evaluation.

[TODO] if you have any read-write and/or read-create objects, please
include the following boilerplate paragraph.

There are a number of management objects defined in this MIB module
with 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. These are the tables and objects and their
sensitivity/vulnerability:

- [TODO] writable MIB objects that could be especially disruptive if
  abused MUST be explicitly listed by name and the associated
  security risks MUST be spelled out; RFC 2669 has a very good
  example.

- [TODO] list the writable tables and objects and state why they are
  sensitive.

[TODO] else if there are no read-write objects in your MIB module,
use the following boilerplate paragraph.

There are no management objects defined in this MIB module that have
a MAX-ACCESS clause of read-write and/or read-create. So, if this
MIB module is implemented correctly, then there is no risk that an
intruder can alter or create any management objects of this MIB
module via direct SNMP SET operations.

[TODO] if you have any sensitive readable objects, please include the
following boilerplate paragraph.

Some of the readable objects in this MIB module (i.e., objects with a
MAX-ACCESS other than not-accessible) may be considered sensitive or
vulnerable in some network environments. It is thus important to
control even GET and/or NOTIFY access to these objects and possibly
to even encrypt the values of these objects when sending them over
the network via SNMP. These are the tables and objects and their
sensitivity/vulnerability:

- [TODO] you must explicitly list by name any readable objects that
  are sensitive or vulnerable and the associated security risks MUST
  be spelled out (for instance, if they might reveal customer
  information or violate personal privacy laws such as those of the
  European Union if exposed to unauthorized parties)

- [TODO] list the tables and objects and state why they are
  sensitive.

[TODO] discuss what security the protocol used to carry the
information should have. The following three boilerplate paragraphs
should not be changed without very good reason. Changes will almost
certainly require justification during IESG review.

SNMP versions prior to SNMPv3 did not include adequate security.
Even if the network itself is secure (for example by using IPSec),
even then, there is no control as to who on the secure network is
allowed to access and GET/SET (read/change/create/delete) the objects
in this MIB module.

It is RECOMMENDED that implementers consider the security features as
provided by the SNMPv3 framework (see [RFC3410], section 8),
including full support for the SNMPv3 cryptographic mechanisms (for
authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT
RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to
enable cryptographic security. It is then a customer/operator
responsibility to ensure that the SNMP entity giving access to an
instance of this MIB module is properly configured to give access to
the objects only to those principals (users) that have legitimate
rights to indeed GET or SET (change/create/delete) them.
9. IANA Considerations

[TODO] In order to comply with IESG policy as set forth in http://www.ietf.org/ID-Checklist.html, every Internet-Draft that is submitted to the IESG for publication MUST contain an IANA Considerations section. The requirements for this section vary depending what actions are required of the IANA. See RFC4181 section 3.5 for more information on writing an IANA clause for a MIB module document.

[TODO] select an option and provide the necessary details.

Option #1:

The MIB module in this document uses the following IANA-assigned OBJECT IDENTIFIER values recorded in the SMI Numbers registry:

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>OBJECT IDENTIFIER value</th>
</tr>
</thead>
<tbody>
<tr>
<td>sampleMIB</td>
<td>mib-2 XXX</td>
</tr>
</tbody>
</table>

Option #2:

Editor’s Note (to be removed prior to publication): the IANA is requested to assign a value for "XXX" under the 'mib-2' subtree and to record the assignment in the SMI Numbers registry. When the assignment has been made, the RFC Editor is asked to replace "XXX" (here and in the MIB module) with the assigned value and to remove this note.

Note well: prior to official assignment by the IANA, a draft document MUST use place-holders (such as "XXX" above) rather than actual numbers. See RFC4181 Section 4.5 for an example of how this is done in a draft MIB module.

Option #3:

This memo includes no request to IANA.

10. Contributors

This MIB document uses the template authored by D. Harrington which is based on contributions from the MIB Doctors, especially Juergen Schoenwaelder, Dave Perkins, C.M.Heard and Randy Presuhn.
11. Acknowledgements

12. References

12.1. Normative References


12.2. Informative References

Appendix A. Change Log

This section identifies the changes that have been made from draft-ietf-manet-dymo-mib-00.

These changes were made from draft-ietf-manet-dymo-mib-00 to draft-ietf-manet-dymo-mib-01.

1. Only minor changes of a typographic nature, e.g., read-only to read-write on MAX_ACCESS clauses of a few configuration objects.

These changes were made from draft-ietf-manet-dymo-mib-01 to draft-ietf-manet-dymo-mib-02.

1. Added the ForwardingFlag and BrokenFlag objects to the DYMO Routing Table.

2. Added the TruthValue Textual Convention to handle the new Routing Table objects.

3. Added the DYMO device management model to the introductory sections of this draft.

4. General clean up of the introductory sections of this draft.

These changes were made from draft-ietf-manet-dymo-mib-02 to draft-ietf-manet-dymo-mib-03.

1. Minor changes to the textual material and added to the IMPORTS text in the introductory material.

2. Added DEFVAL clauses to all read-write configuration objects having default values identified in the DYMO specification.

These changes were made from draft-ietf-manet-dymo-mib-03 to draft-ietf-manet-dymo-mib-04.

1. Incorporated the DID into the Configuration Group by changing the dymoAdminStatus object to an Instance Table. This allows for the presence of multiple DYMO processes concurrent on the same router.

2. Added the dymoNotifObjectsGroup and its dymoSetNotifications object to allow for individual control of the DYMO Notifications. Updated the Conformance sections accordingly.

3. Renamed several of the Configuration Objects to be consistent with the naming within the current draft-ietf-manet-dymo-21.
Appendix B. Open Issues

This section contains the set of open issues related to the development and design of the DYMO-MIB. This section will not be present in the final version of the MIB and will be removed once all the open issues have been resolved.

1. Work on the Security Section. This MIB does have settable objects, but not sensitive objects (true?).

2. Work on the relationship to other MIBs, IF-MIB, NHDP-MIB.

3. Cleanup all the [TODOs] from the MIB template.

Appendix C.

***************************************************************
* Note to the RFC Editor (to be removed prior to publication) *
* 1) The reference to RFCXXXX within the DESCRIPTION clauses *
* of the MIB module point to this draft and are to be *
* assigned by the RFC Editor. *
* 2) The reference to RFCXXX2 throughout this document point *
* to the current draft-ietf-manet-dymo-xx.txt. This *
* need to be replaced with the XXX RFC number. *
***************************************************************

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