Definitions of Managed Objects for MAP-E

draft-fu-softwire-map-mib-03

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Abstract

This memo defines a portion of the Management Information Base (MIB) for using with network management protocols in the Internet community. In particular, it defines managed objects for MAP encapsulation mode.

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1. Introduction

MAP [I-D. draft-ietf-softwire-map] is a stateless mechanism for running IPv4 over IPv6-only infrastructure. In particular, it includes two mode, translation mode or encapsulation mode. For the encapsulation mode, it provides an automatic tunnelling mechanism for providing IPv4 connectivity service to end users over a service provider's IPv6 network.

This document defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. This MIB module may be used for monitoring the devices in the MAP scenario, especially, for the encapsulation mode.

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 [RFC3410].

Managed objects are accessed via a virtual information store, termed the 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 [RFC2578], [RFC2579] and [RFC2580].

3. Terminology

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 [RFC2119].

4. Structure of the MIB Module

The MAP-E MIB provides a way to configure and manage the devices in MAP encapsulation mode through SNMP.

MAP-E MIB is configurable on a per-interface basis. It depends on several parts of the IF-MIB [RFC2863].
4.1. The mapMIBObjects

4.1.1. The mapRule Subtree

The mapRule subtree describes managed objects used for managing the multiple mapping rules in the MAP encapsulation mode.

4.1.2. The mapTunnel Subtree

The mapTunnel subtree provides statistical information of the tunnelling for MAP BRs or MAP tunnel endpoints.

4.2. The mapMIBConformance Subtree

The mapMIBConformance subtree provides conformance information of MIB objects.

5. Definitions

MAP-E-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, mib-2, transmission,
    Gauge32, Integer32, Counter64
    FROM SNMPv2-SMI  --[RFC2578]

    RowStatus, StorageType, DisplayString
    FROM SNMPv2-TC  --[RFC2579]

    ifIndex, InterfaceIndexOrZero
    FROM IF-MIB  --[RFC2863]

    InetAddress, InetAddressIPv6,
    InetPortNumber, InetAddressPrefixLength
    FROM INET-ADDRESS-MIB  --[RFC4001]

    OBJECT-GROUP, MODULE-COMPLIANCE,
    NOTIFICATION-GROUP
    FROM SNMIPv2-CONF;  --[RFC2580]

mapMIB MODULE-IDENTITY
LAST-UPDATED "201302070000Z"  -- February 6, 2013
ORGANIZATION "IETF Softwire Working Group"
CONTACT-INFO
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Huawei Technologies Co., Ltd
Huawei Building, 156 Beiqing Rd., Hai-Dian District

DESCRIPTION
"The MIB module is defined for management of objects in the MAP-E BRs or CEs."

REVISION    "201302070000Z"

::=  {  transmission xxx  }  --xxx to be replaced with correct value

mapMIBObjects OBJECT IDENTIFIER ::= {mapMIB 1}

mapRule   OBJECT IDENTIFIER
 ::=  { mapMIBObjects 1 }

mapTunnel   OBJECT IDENTIFIER
 ::=  { mapMIBObjects 2 }
mapRuleTable OBJECT-TYPE
SYNTAX    SEQUENCE OF mapRuleEntry
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"The (conceptual) table containing rule Information of specific mapping rule. It can also be used for row creation."
::=  { mapRule 1 }

mapRuleEntry OBJECT-TYPE
SYNTAX    MapRuleEntry
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"Each entry in this table contains the information on a particular mapping rule."
INDEX   { mapRuleID }
::=  { mapRuleTable 1 }

mapRuleEntry  ::=  
SEQUENCE {
  mapRuleID                   Integer32,
  mapRuleIPv6Prefix           InetAddressIPv6,
  mapRuleIPv6PrefixLen        InetAddressPrefixLength,
  mapRuleIPv4Prefix           InetAddress,
  mapRuleIPv4PrefixLen        InetAddressPrefixLength,
  mapRuleStartPort            InetPortNumber,
  mapRuleEndPort              InetPortNumber,
  mapRuleEALen                Integer32,
  mapRuleStatus               RowStatus,
  mapRuleStorageType          StorageType
}

mapRuleID OBJECT-TYPE
SYNTAX    Integer32 (1..2147483647)
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"An identifier used to distinguish the multiple mapping rule which is unique with each CE in the same BR."
::=  { mapRuleEntry 1 }

mapRuleIPv6Prefix OBJECT-TYPE
SYNTAX    InetAddressIPv6
MAX-ACCESS read-create
STATUS    current
DESCRIPTION
"The IPv6 prefix defined in mapping rule which will be
assigned to CE."
 ::= { mapRuleEntry 2 }

mapRuleIPv6PrefixLen OBJECT-TYPE
SYNTAX     InetAddressPrefixLength
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"The length of the IPv6 prefix defined in the mapping rule.
As a parameter for mapping rule, it will be also assigned
to CE."
 ::= { mapRuleEntry 3 }

mapRuleIPv4Prefix OBJECT-TYPE
SYNTAX     InetAddress
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"The IPv4 prefix defined in mapping rule which will be
assigned to CE."
 ::= { mapRuleEntry 4 }

mapRuleIPv4PrefixLen OBJECT-TYPE
SYNTAX     InetAddressPrefixLength
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"The length of the IPv4 prefix defined in the mapping
rule. As a parameter for mapping rule, it will be also
assigned to CE."
 ::= { mapRuleEntry 5 }

mapRuleStartPort OBJECT-TYPE
SYNTAX     InetPortNumber
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"The start port number of the port range derived
from the mapping rule which will be assigned to CE."
 ::= { mapRuleEntry 6 }

mapRuleEndPort OBJECT-TYPE
SYNTAX     InetPortNumber
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"The end port number of the port range derived
from the mapping rule which will be assigned to CE."
::= { mapRuleEntry 7 }

mapRuleEALen OBJECT-TYPE
SYNTAX     Integer32
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"The length of the Embedded-Address (EA) defined in
mapping rule which will be assigned to CE."
::= { mapRuleEntry 8 }

mapRuleStatus OBJECT-TYPE
SYNTAX     RowStatus
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"The status of this row, by which new entries may be
created, or old entries deleted from this table."
::= { mapRuleEntry 9 }

mapRuleStorageType OBJECT-TYPE
SYNTAX     StorageType
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"The storage type of this row. If the row is
permanent(4), no objects in the row need be
writable."
::= { mapRuleEntry 10 }

mapTunnelTable OBJECT-TYPE
SYNTAX     SEQUENCE OF MapTunnelEntry
MAX-ACCESS read-create
STATUS     current
DESCRIPTION
"The (conceptual) table containing information on
configured tunnels. This table can be used to statistic
the CEs connected to a certain BR. It can also be used for
row creation."
::= { mapTunnel 1 }

mapTunnelEntry OBJECT-TYPE
SYNTAX     mapTunnelEntry
MAX-ACCESS read-create
Each entry in this table contains the information on a particular MAP tunnel.

INDEX { mapTunnelCEAddress, mapTunnelMapRuleID}
::= { mapTunnelTable 1 }

mapTunnelEntry ::= SEQUENCE {
  mapTunnelCEAddress InetAddressIPv6,
  mapTunnelStaticReceived Counter64,
  mapTunnelStaticSent Counter64,
  mapTunnelStatus RowStatus,
  mapTunnelStorageType StorageType
}

mapTunnelCEAddress OBJECT-TYPE
SYNTAX InetAddressIPv6
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The address of the CE. It is one endpoint of the MAP Tunnel"
::= { mapTunnelEntry 1 }

mapTunnelStaticReceived OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object indicate the count number of the Received packets in a particular tunnel."
::= { mapTunnelEntry 2 }

mapTunnelStaticSent OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"This object indicate the count number of the Sent packet in a particular tunnel."
::= { mapTunnelEntry 3 }

mapTunnelStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The status of this row, by which new entries may be
created, or old entries deleted from this table.
::= { mapTunnelEntry 4 }

mapTunnelStorageType OBJECT-TYPE
SYNTAX StorageType
MAX-ACCESS read-create
STATUS current
DESCRIPTION
"The storage type of this row. If the row is
permanent(4), no objects in the row need be
writable."
::= { mapTunnelEntry 5 }

-- Conformance Information

mapMIBConformance OBJECT IDENTIFIER ::= {mapMIB 2}

mapMIBCompliances OBJECT IDENTIFIER ::= { mapMIBConformance 1 }

mapMIBGroups OBJECT IDENTIFIER ::= { mapMIBConformance 2 }

-- compliance statements

mapMIBBasicCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
" Describes the minimal requirements for conformance
to the MAP-E MIB."
MODULE -- this module
MANDATORY-GROUPS { mapMIBRuleGroup }
::= { mapMIBCompliances 1 }

mapMIBFullCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
" Describes the requirements for conformance
to support full functions of the MAP-E MIB."
MODULE -- this module
MANDATORY-GROUPS { mapMIBRuleGroup,
mapMIBTunnelGroup }
::= { mapMIBCompliances 2 }

-- Units of Conformance

mapMIBRuleGroup OBJECT-GROUP
  OBJECTS { mapRuleBRAddress, mapMapRuleID, mapRuleIPv6Prefix, mapRuleIPv6PrefixLen, mapRuleIPv4Prefix, mapRuleIPv4PrefixLen, mapRuleStartPort, mapRuleEndPort mapRuleEALen, mapRuleStorageType }
  STATUS current
  DESCRIPTION
    " The collection of this objects are used to give the information of mapping rules in MAP-E."
  ::= { mapMIBGroups 1 }

mapMIBTunnelGroup OBJECT-GROUP
  OBJECTS { mapTunnelCEAddress, mapTunnelStaticReceived, mapTunnelStaticSent, mapTunnelStatus, mapTunnelStorageType, mapRuleStorageType }
  STATUS current
  DESCRIPTION
    " The collection of this objects are used to give the information for tunnels in MAP-E."
  ::= { mapMIBGroups 2 }

END

6. IANA Considerations

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>MAP-E-MIB</td>
<td>{ transmission XXX }</td>
</tr>
</tbody>
</table>

7. Security Considerations

The MAP-E MIB module can be used for configuration of certain objects, and anything that can be configured can be incorrectly configured, with potentially disastrous results. Because this MIB
module reuses the IP tunnel MIB, the security considerations for these MIBs are also applicable to the MAP-E MIB.

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 principles (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

8. References

8.1. Normative References


8.2. Informative References


9. Change Log [RFC Editor please remove]

draft-fu-softwire-map-mib-00, original version, 2012-03-01
draft-fu-softwire-map-mib-01, 01 version, 2012-07-16
draft-fu-softwire-map-mib-03, deleted tunnel object according to the discussion in IETF85, 2013-02-04
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