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Definitions of Managed Objects for the Fourth Version of Border Gateway
Protocol (BGP-4), BGP Community Extension
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Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols. In particular it defines objects for managing the Border Gateway Protocol's Community extension.

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BGP-4 Community MIB

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1. Introduction

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols. In particular it defines objects for managing the Border Gateway Protocol's Community extension. [[RFC1997](#)].

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 BGP-4 MIB, Version 2, provides for an extension mechanism by which BGP extensions can have MIBs created under the BGP-4 MIB subtree. This MIB documents the objects for managing the BGP-4 Community extension as documented in [[RFC1997](#)].

5. Structure of the MIB Module

[5.1.](#) Tables

- o bgp4V2CommunityTable - This table provides access to a human-readable version of the community associated with BGP reachability and also access to the encoded version of the communities attached to the reachability.

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[6.](#) Relationship to Other MIB Modules

[6.1.](#) MIB modules required for IMPORTS

The following MIB module IMPORTS objects from SNMPv2-SMI [[RFC2578](#)], SNMPv2-TC [[RFC2579](#)], SNMPv2-CONF [[RFC2580](#)] and the BGP-4 MIB, Version 2.

[7.](#) Definitions

BGP4V2-COMMUNITY-MIB DEFINITIONS ::= BEGIN

IMPORTS

```
mib-2, MODULE-IDENTITY, OBJECT-TYPE
    FROM SNMPv2-SMI
MODULE-COMPLIANCE, OBJECT-GROUP
    FROM SNMPv2-CONF
SnmAdminString
    FROM SNMP-FRAMEWORK-MIB
Bgp4V2AddressFamilyIdentifierTC,
Bgp4V2SubsequentAddressFamilyIdentifierTC
    FROM BGP4V2-TC-MIB
bgp4V2PeerInstance, bgp4V2NlriAfi, bgp4V2NlriSafi,
bgp4V2NlriPrefix, bgp4V2NlriPrefixLen,
bgp4V2PeerLocalAddrType, bgp4V2PeerLocalAddr,
bgp4V2PeerRemoteAddrType, bgp4V2PeerRemoteAddr,
bgp4V2NlriIndex
    FROM BGP4V2-MIB;
```

```

bgp4V2Community MODULE-IDENTITY
    LAST-UPDATED "200811020000Z"
    ORGANIZATION "IETF IDR Working Group"
    CONTACT-INFO "E-mail:  idr@ietf.org"
    DESCRIPTION
        "This MIB module defines additional management objects
        for the Border Gateway Protocol, Version 4.
        Specifically, it adds objects for the management of the
        BGP Community PATH_ATTRIBUTE as documented in RFC 1997."
    REVISION "200811020000Z"
    DESCRIPTION
        "Initial revision."
    ::= { mib-2 XXX }

-- Top level components of this MIB module

-- Objects

```

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```

bgp4V2CommunityObjects
    OBJECT IDENTIFIER ::= { bgp4V2Community 1 }

-- Conformance
bgp4V2CommunityConformance
    OBJECT IDENTIFIER ::= { bgp4V2Community 2 }

--
-- BGP Communities per-NLRI entry.
--

bgp4V2CommunityTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF Bgp4V2CommunityEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The BGP-4 Path Attribute Community Table contains the
        per network path (NLRI) data on the community membership
        advertised with a route."
    ::= { bgp4V2CommunityObjects 1 }

bgp4V2CommunityEntry OBJECT-TYPE

```

```

SYNTAX      Bgp4V2CommunityEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Information about a community association provided with a
    path to a network. Note that although this table shares
    the indices of bgp4V2NlriTable that not all reachability
    may have communities."
INDEX {
    bgp4V2PeerInstance,
    bgp4V2NlriAfi,
    bgp4V2NlriSafi,
    bgp4V2NlriPrefix,
    bgp4V2NlriPrefixLen,
    bgp4V2PeerLocalAddrType,
    bgp4V2PeerLocalAddr,
    bgp4V2PeerRemoteAddrType,
    bgp4V2PeerRemoteAddr,
    bgp4V2NlriIndex
}
 ::= { bgp4V2CommunityTable 1 }

Bgp4V2CommunityEntry ::= SEQUENCE {
    bgp4V2CommunityString
        SnmpAdminString,
    bgp4V2Communities

```

```

    OCTET STRING
}

bgp4V2CommunityString OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This is a string depicting the set of communities
        associated with a given NLRI. The format of this string is
        implementation-dependent and should be designed for
        operator readability.

        Note that SnmpAdminString is only capable of representing a
        maximum of 255 characters. This may lead to the string

```

being truncated in the presence of a large AS Path. It is RECOMMENDED that when this object's contents will be truncated that the final 3 octets be reserved for the ellipses string, '...'. bgp4V2Communities may give access to the full set of communities."

::= { bgp4V2CommunityEntry 1 }

bgp4V2Communities OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(0..4072))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object contains the list of BGP Communities associated with the reachability. Each community consists of four octets and is interpreted according to the syntax documented in [RFC 1997](#). Briefly, the first two octets of each community is a 2-octet Autonomous System number in network byte order and the lower two octets is a 2-octet number with semantics specific to that AS.

Note also that certain well-known values will have additional semantics.

In the circumstance where this object must be truncated by the implementation, the implementation SHOULD truncate the object on a 4-octet divisible boundary in order to provide all communities in-tact."

::= { bgp4V2CommunityEntry 2 }

--

-- Conformance Information

--

bgp4V2CommunityMIBCompliances OBJECT IDENTIFIER ::= { bgp4V2CommunityConformance 1 }

bgp4V2CommunityMIBGroups OBJECT IDENTIFIER ::= { bgp4V2CommunityConformance 2 }

bgp4V2CommunityMIBCompliance MODULE-COMPLIANCE
STATUS current

```

DESCRIPTION
    "The compliance statement for entities which
    implement the BGP4 mib."
MODULE -- this module
MANDATORY-GROUPS {
    bgp4V2CommunityRequiredGroup
}
::= { bgp4V2CommunityMIBCompliances 1 }

bgp4V2CommunityRequiredGroup OBJECT-GROUP
OBJECTS {
    bgp4V2CommunityString,
    bgp4V2Communities
}
STATUS current
DESCRIPTION
    "Objects associated with BGP communities that are
    required to be implemented in this MIB."
::= { bgp4V2CommunityMIBGroups 1 }
END

```

8. Security Considerations

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:

- o bgp4V2CommunityString, bgp4V2Communities - BGP Communities may be used to implement routing policy for ISPs and that routing policy may reflect business relationships. Inadvertent disclosure of this information inadvertently expose sensitive information about those business relationships.

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

This memo includes no request to IANA.

[10.](#) References

[10.1.](#) Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.
- [RFC2579] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Textual Conventions for SMIv2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Conformance Statements for SMIv2", STD 58, [RFC 2580](#), April 1999.
- [RFC1997] Chandrasekeran, R., Traina, P., and T. Li, "BGP Communities Attribute", [RFC 1997](#), August 1996.

[10.2.](#) Informative References

- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", [RFC 3410](#), December 2002.

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