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J. Schoenwaelder
International University Bremen
T. Jeffree
Consultant

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Simple Network Management Protocol (SNMP) over IEEE 802 Networks

Status of This Memo

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Abstract

This document specifies how Simple Network Management Protocol (SNMP) messages can be transmitted directly over IEEE 802 networks.

This document obsoletes RFC 1089.

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1. Introduction

This document specifies how Simple Network Management Protocol (SNMP) messages can be transmitted directly over IEEE 802 networks. For a detailed overview of the documents that describe the Internet-Standard management framework, please refer to section 7 of RFC 3410 [RFC3410]. This document supplements the standard SNMP transport mappings defined in RFC 3417 [RFC3417].

This document obsoletes RFC 1089.

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].

1.1. Key Words

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].

2. Definitions

```
SNMP-IEEE802-TM-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-IDENTITY, snmpModules, snmpDomains
        FROM SNMPv2-SMI;

    snmpIeee802TmMib MODULE-IDENTITY
        LAST-UPDATED "200611210000Z"
        ORGANIZATION "IETF Operations and Management Area"
        CONTACT-INFO
            "Juergen Schoenwaelder (Editor)
             International University Bremen
             P.O. Box 750 561
             28725 Bremen, Germany

             Phone: +49 421 200-3587
             EMail: j.schoenwaelder@iu-bremen.de

             Send comments to <ietfmibs@ops.ietf.org>."
        DESCRIPTION
            "This MIB module defines the SNMP over IEEE 802
             transport mapping.

             Copyright (C) The IETF Trust (2006).  This version
             of this MIB module is part of RFC 4789; see the RFC
             itself for full legal notices."
        REVISION "200611210000Z"
        DESCRIPTION
            "The initial version, published as RFC 4789."
        ::= { snmpModules 21 }

    snmpIeee802Domain OBJECT-IDENTITY
        STATUS  current
        DESCRIPTION
            "The SNMP over IEEE 802 networks transport domain.  The
             corresponding transport address is of type MacAddress
             as defined in the SNMPv2-TC module (RFC 2579)."
        REFERENCE "RFC 2579"
        ::= { snmpDomains 6 }
END
```

3. SNMP over IEEE 802 Networks

This is an optional transport mapping. The need to carry SNMP directly over an 802 LAN transport in order to allow for the management of simple devices was identified in applications like the Two-Port Media Access Control (MAC) Relay, which is being developed in IEEE 802.1 as project P802.1aj [802.1aj].

SNMP over IEEE 802 networks has some inherent restrictions. Using the SNMP over IEEE 802 transport mapping restricts messages to a single logical IEEE 802 LAN, bridged LAN or VLAN. Furthermore, only a single SNMP engine can be addressed on a given IEEE 802 network interface. In particular, command generators and notification receivers, as well as command responders and notification originators, must share a single transport endpoint.

3.1. Serialization

SNMP messages are serialized, as described in Section 8 of RFC 3417 [RFC3417]. The resulting serialized message is shipped in the data portion of an IEEE LAN MAC frame.

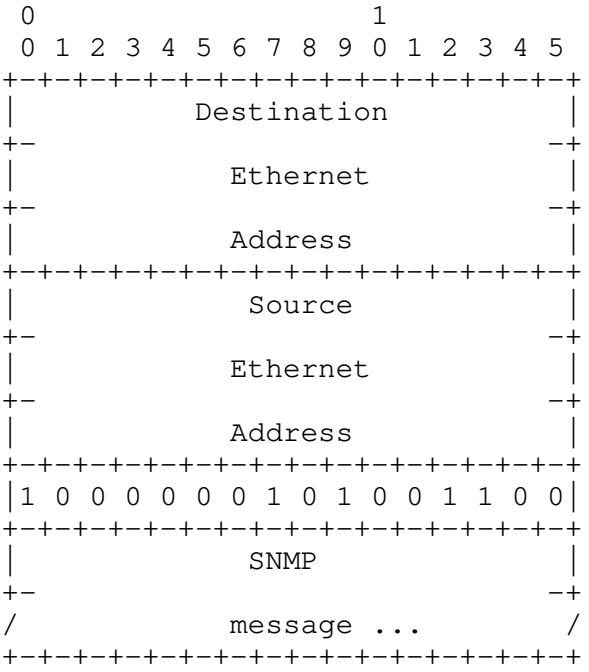
3.2. Well-known Values

Serialized SNMP messages are sent in IEEE 802.3 frames with an Ethernet type field of 33100 (hexadecimal 814C).

When serialized SNMP messages are sent in IEEE 802.3 frames (and in other IEEE 802 MAC frame types that can natively represent Ethernet type values), an Ethernet type field value of 33100 (hexadecimal 814C) MUST be used as the link layer protocol identifier. In IEEE 802 LANs that use LLC as the means of link layer protocol identification, such as IEEE 802.11 Wireless LANs, the SNAP encapsulation method described in subclause 10.5 "Encapsulation of Ethernet frames over LLC" in [IEEE802] MUST be used.

When an SNMP entity uses this transport mapping, it MUST be capable of accepting SNMP messages up to and including 484 octets in size. It is RECOMMENDED that implementations be capable of accepting messages of up to 1472 octets in size. Implementation of larger values is encouraged whenever possible.

3.3. IEEE 802.3 Frame Format



(Each tic mark represents one bit.)

4. Relationship to Other MIB Modules

Several core SNMP MIB modules use TDomain/TAddress pairs to identify SNMP transport endpoints. The SNMP-TARGET-MIB [RFC3413] uses TDomain/TAddress pairs to identify targets that can be used as notification receivers. TDomain/TAddress pairs are used by the NOTIFICATION-LOG-MIB [RFC3014] to record the source from which a notification was received. The ENTITY-MIB [RFC4133] uses TDomain/TAddress pairs to provide the transport endpoint of logical entities.

The MIB module contained in this document introduces the object identifier constant snmpIeee802Domain. This constant can be assigned to an object of type TDomain to identify an SNMP over IEEE 802 endpoint, in which case the corresponding TAddress will have a value that conforms to the MacAddress textual convention. By providing these definitions, it is possible to use the generic MIB modules to refer to SNMP over IEEE 802 endpoints.

5. IANA Considerations

IANA made a MIB OID assignment under the snmpModules branch for the SNMP-IEEE802-TM-MIB module.

IANA assigned an OID value below snmpDomains for the transport domain. This first required the setup of a registry for OIDs under snmpDomains. At the point of this writing, the following assignments already exist:

Prefix: iso.org.dod.internet.snmpv2.snmpDomains (1.3.6.1.6.1)

Decimal	Name	Description	References
1	snmpUDPDomain	SNMP over UDP	[RFC3417]
2	snmpCLNSDomain	SNMP over CLNS	[RFC3417]
3	snmpCONSDomain	SNMP over CONS	[RFC3417]
4	snmpDDPDomain	SNMP over DDP	[RFC3417]
5	snmpIPXDomain	SNMP over IPX	[RFC3417]

The following assigment has been made:

Decimal	Name	Description	References
6	snmpIeee802Domain	SNMP over IEEE 802	RFC 4789

For new assignments, a specification is required as per [RFC2434].

6. Security Considerations

This module does not define any management objects. Instead, it defines an OBJECT-IDENTIFIER which may be used by other MIB modules to identify an SNMP transport mapping. Meaningful security considerations can only be written in the MIB modules that define management objects. The MIB module in this document has therefore no impact on the security of the Internet.

SNMPv1 and SNMPv2c messages are not considered secure. It is recommended that the implementors consider the use of SNMPv3 messages and the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model STD 62, RFC 3414 [RFC3414] and the View-based Access Control Model STD 62, RFC 3415 [RFC3415] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to a MIB is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change) them.

7. Acknowledgments

The original SNMP over Ethernet definition was written by Marty Schoffstall, Chuck Davin, Mark Fedor, and Jeff Case, and published as RFC 1089 [RFC1089].

Bert Wijnen and Dan Romascanu provided guidance on many aspects of this revised specification. David Harrington provided useful comments that improved the presentation.

8. References

8.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC2578] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Structure of Management Information Version 2 (SMIv2)", STD 58, RFC 2578, April 1999.

[RFC2579] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "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.

[RFC3417] Presuhn, R., Ed., "Transport Mappings for the Simple Network Management Protocol (SNMP)", STD 62, RFC 3417, December 2002.

[IEEE802] "IEEE Standard for Local Area Networks: Overview and Architecture", IEEE Std. 802-2001.

[RFC2434] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 2434, October 1998.

8.2. 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.

[RFC3413] Levi, D., Meyer, P., and B. Stewart, "Simple Network Management Protocol (SNMP) Applications", STD 62, RFC 3413, December 2002.

[RFC3414] Blumenthal, U. and B. Wijnen, "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", STD 62, RFC 3414, December 2002.

[RFC3415] Wijnen, B., Presuhn, R., and K. McCloghrie, "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", STD 62, RFC 3415, December 2002.

[RFC3014] Kavasseri, R., "Notification Log MIB", RFC 3014, November 2000.

[RFC4133] Bierman, A. and K. McCloghrie, "Entity MIB (Version 3)", RFC 4133, August 2005.

[RFC1089] Schoffstall, M., Davin, C., Fedor, M., and J. Case, "SNMP over Ethernet", RFC 1089, February 1989.

[802.1aj] P802.1aj/D1.4 Draft Standard for Local and Metropolitan Area Networks - Virtual Bridged Local Area Networks - Amendment 08: Two-Port Media Access Control (MAC) Relay, IEEE 802.1 Working Group, June 2006, Work in Progress.

Authors' Addresses

Juergen Schoenwaelder
International University Bremen
Campus Ring 1
28725 Bremen
Germany

Phone: +49 421 200-3587
EMail: j.schoenwaelder@iu-bremen.de

Tony Jeffree
Consultant
11a Poplar Grove
Sale, Cheshire, M33 3AX
United Kingdom

Phone: +44-161-973-4278
EMail: tony@jeffree.co.uk

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