Network Working Group
Internet-Draft
Category: Informational
Expires: November 22, 2004

E. Stephan
France Telecom R&D
J. Palet
Consulintel
May 24, 2004

Remote Network Monitoring (RMON) Protocol Identifiers for IPv6 and Multi Protocol Label Switching (MPLS) draft-ietf-rmonmib-pi-ipv6-04.txt

Status of this Memo

Copyright Notice

Abstract

This memo defines additional (to those in RFC2896) protocol identifier examples for IP version 6 and MPLS protocols. These can be

used to produce valid protocolDirTable INDEX encodings, as defined by the Remote Network Monitoring MIB (Management Information Base) Version 2 (RFC2021) and the RMON Protocol Identifier Reference (RFC2895).

This document contains additional (to those in RFC2896) protocol identifier macros for well-known protocols. A conformant implementation of the RMON-2 MIB (RFC2021) can be accomplished

without the use of these protocol identifiers, and accordingly, this document does not specify any IETF standard. It is published to encourage better interoperability between RMON-2 agent implementations, by providing RMON related IPv6 and MPLS protocol information.

Table of Contents

1. 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].

2. Overview

This memo defines basic protocol identifiers for IP version 6 and MPLS protocols.

The "Remote Network Monitoring MIB Protocol Identifier Macros" [RFC2896], defines various protocol identifiers. The syntax of the protocol identifier descriptor is defined in the RMON Protocol Identifier Reference [RFC2895]. The reader should be familiar with these documents.

The intent of this document is not to adapt each protocol identifier defined in the RFC 2895 and in the RFC 2896 to IP version 6, but to define protocol identifiers for IP version 6 protocols and for MPLS protocol.

3. Relationship to the Remote Network Monitoring MIB

RMON MIB implementations use protocol identifiers to describe unambiguous capabilities in protocolDirTable entries.

4. MPLS layer protocol identifiers

This section defines protocol identifiers for MPLS with unambiguous names to distinguish MPLS Unicast from MPLS Multicast.

```
   -- MPLS unicast


   mplsu PROTOCOL-IDENTIFIER
      PARAMETERS { }
      ATTRIBUTES { }
      DESCRIPTION
                "MPLS Label Stack Encoding."


      CHILDREN
                "Children of MPLS are not systematically identifiable. "
      REFERENCE
                "RFC 3032, MPLS Label Stack Encoding [RFC3032]."
      ::= {
                ether2  0x8847, -- RFC 3032 section 5
                snap    0x8847,
                802-1Q  0x8847,
                ppp     0x0281, -- RFC 3032 section 4.3
      }


   -- MPLS multicast


   mplsm PROTOCOL-IDENTIFIER
      PARAMETERS { }
      ATTRIBUTES { }
      DESCRIPTION
                "MPLS Label Stack Encoding."
      CHILDREN
                "Children of MPLS are not systematically identifiable."
      REFERENCE
                "RFC 3032, MPLS Label Stack Encoding [RFC3032]."
      ::= {
                ether2  0x8848, -- RFC 3032 section 5
                snap    0x8848,
                802-1Q  0x8848,
                ppp     0x0283, -- RFC 3032 section 4.3
      }
```

5. IPv6 Protocols

```
   ip6 PROTOCOL-IDENTIFIER
        PARAMETERS {}
        ATTRIBUTES {}
        DESCRIPTION
                "The protocol identifiers for the Internet Protocol, Version 6
```

```
                [RFC2460]."
        CHILDREN
                "Children of 'ip6' are selected by the value in the Protocol
                field (one octet), as defined in the PROTOCOL NUMBERS table
                within the Assigned Numbers Document.


                The value of the Protocol field is encoded in an octet string
as
                [ 0.0.0.a ], where 'a' is the protocol field.
                Children of 'ip6' are encoded as [ 0.0.0.a ], and named as 'ip6
                a' where 'a' is the protocol field value.  For example, a
                protocolDirID-fragment value of:
                  0.0.0.1.0.0.0.41.0.0.0.58


                defines an encapsulation of IPv6-ICMP (ether2.ip6.icmp6)"
        ADDRESS-FORMAT
                "16 octets of the IPv6 address, in network byte order.  Each ip
                packet contains two addresses, the source address and the
                destination address."
        DECODING
                "Note: ether2.ip.ipip6.udp is a different protocolDirID than
                ether2.ip6.udp, as identified in the protocolDirTable.  As
such,
                two different local protocol index values will be assigned by
                the agent. E.g. (full INDEX values shown):
                ether2.ip.ipip6.udp =
                                16.0.0.0.1.0.0.8.0.0.0.0.41.0.0.0.17.4.0.0.0.0
                ether2.ip6.udp =
                                12.0.0.0.1.0.0.0.41.0.0.0.17.3.0.0.0 "
        REFERENCE


                "RFC 2460 [RFC2460] defines the Internet Protocol version 6;
The
                following URL defines the authoritative repository for the
                PROTOCOL NUMBERS Table:


                  http://www.iana.org/assignments/protocol-numbers"
        ::= {
                ether2     0x86DD,
                802-1Q     0x86DD,
                mplsu       41,
                mplsm       41
        }
```

```
   ipip6 PROTOCOL-IDENTIFIER
        PARAMETERS { }
        ATTRIBUTES {


           }
        DESCRIPTION
                "IPv6 in IPv4 Tunneling"
```

```
        CHILDREN
                "Children of 'ipip6' are selected and encoded in the same
manner
                as children of ip6."
        ADDRESS-FORMAT
                "The 'ipip6' address format is the same as the IPv6 address
                format."
        DECODING
                "Note: ether2.ip.ipip6.udp is a different protocolDirID than
                ether2.ip6.udp, as identified in the protocolDirTable.  As
such,
                two different local protocol index values will be assigned by
                the agent. E.g. (full INDEX values shown):
                                ether2.ip.ipip6.udp =

16.0.0.0.1.0.0.8.0.0.0.0.41.0.0.0.17.4.0.0.0.0
                                ether2.ip6.udp =
                                        12.0.0.0.1.0.0.0.41.0.0.0.17.3.0.0.0 "
        REFERENCE
                "RFC 2473 [RFC2473] defines Generic Packet Tunneling in IPv6
                Specification."
        ::= {
                ip 41
        }


   icmp6 PROTOCOL-IDENTIFIER
      PARAMETERS { }
      ATTRIBUTES { }
      DESCRIPTION
                "Internet Message Control Protocol for IP Version 6"
      REFERENCE
                "RFC 2463 [RFC2463] Internet Control Message Protocol (ICMPv6)
                for the Internet Protocol Version 6 (IPv6) Specification "
      ::= {
                ip6 58,
                ipip6 58
      }
```

6. Security Considerations

This document contains textual descriptions of well-known networking protocols, not the definition of any networking behavior. As such,

no security considerations are raised by its publication.

7. Acknowledgments

The authors would like to acknowledge the European Commission support in the co-funding of the 6QM project, where this work is being

developed.

8. IANA Considerations

There are no IANA considerations for this document.

9. References

9.1 Normative References

[RFC2460] Deering, S. and R. Hinden, "Internet Protocol, Version 6 (IPv6) Specification", RFC 2460, December 1998.

[RFC2463] Conta, A. and S. Deering, "Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification", RFC 2463, December 1998.

[RFC2473] Conta, A. and S. Deering, "Generic Packet Tunneling in IPv6 Specification", RFC 2473, December 1998.

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

[RFC2579] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., McCloghrie, K., Rose, M. and S. Waldbusser, "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.

[RFC2895] Bierman, A., Bucci, C. and R. Iddon, "Remote Network Monitoring MIB Protocol Identifier Reference", RFC 2895, August 2000.

[RFC3032] Rosen, E., Tappan, D., Fedorkow, G., Rekhter, Y., Farinacci, D., Li, T. and A. Conta, "MPLS Label Stack Encoding", RFC 3032, January 2001.

9.2 Informative References

[RFC2021] Waldbusser, S., "Remote Network Monitoring Management Information Base Version 2 using SMIv2", RFC 2021, January 1997.

[RFC2026] Bradner, S., "The Internet Standards Process -- Revision

3", BCP 9, RFC 2026, October 1996.

[RFC2896] Bierman, A., Bucci, C. and R. Iddon, "Remote Network Monitoring MIB Protocol Identifier Macros", RFC 2896, August 2000.

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

Authors' Addresses

Stephan Emile
France Telecom R & D
2 avenue Pierre Marzin
Lannion, F-22307

Fax: +33 2 96 05 18 52
EMail: emile.stephan@francetelecom.com

Jordi Palet
Consulintel, IPv6 R&D
San Jose Artesano, 1
Alcobendas, Madrid, Spain E-28108

Fax: +34 91 151 81 98
EMail: jordi.palet@consulintel.es

Intellectual Property Statement

Full Copyright Statement

Acknowledgment

Funding for the RFC Editor function is currently provided by the Internet Society.