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Definitions of Textual Conventions (TCs) for Bidirectional Forwarding Detection (BFD) Management
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Abstract

This draft defines a Management Information Base (MIB) module which contains Textual Conventions to represent commonly used Bidirectional Forwarding Detection (BFD) management information. The intent is that these TEXTUAL CONVENTIONS (TCs) will be imported and used in BFD related MIB modules that would otherwise define their own representations.

Requirements Language

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 BCP 14, RFC 2119 [RFC2119].

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on December 20, 2013.

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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. Introduction

This document defines a MIB module which contains Textual Conventions for Bidirectional Forwarding Detection (BFD) protocols. These Textual Conventions should be imported by MIB modules which manage BFD protocols.

For an introduction to the concepts of BFD, see [RFC5880], [RFC5881] and [RFC5883].

3. BFD Textual Conventions MIB Definitions

```
BFD-TC-STD-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, mib-2, Unsigned32
        FROM SNMPv2-SMI                                 -- [RFC2578]

    TEXTUAL-CONVENTION
        FROM SNMPv2-TC;                                 -- [RFC2579]

bfdTCStdMib MODULE-IDENTITY
    LAST-UPDATED "201306191200Z" -- 19 June 2013 12:00:00 EST
    ORGANIZATION "IETF Bidirectional Forwarding Detection
                  Working Group"
    CONTACT-INFO
        "Thomas D. Nadeau
         Juniper Networks
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    DESCRIPTION
        "This MIB module defines TEXTUAL-CONVENTIONs for concepts
         used in Bidirectional Forwarding Detection (BFD)
         protocols."
    REVISION "201306191200Z" -- 19 June 2013 12:00:00 EST
    DESCRIPTION
        "Initial version. Published as RFC xxxx."
-- RFC Ed.: RFC-editor pls fill in xxxx
::= { mib-2 XXX }
-- RFC Ed.: assigned by IANA, see section 5 for details

BfdSessIndexTC ::= TEXTUAL-CONVENTION
DISPLAY-HINT   "d"
STATUS         current
DESCRIPTION
    "An index used to uniquely identify BFD sessions."
SYNTAX Unsigned32 (1..4294967295)
```

```
    BfdIntervalTC ::= TEXTUAL-CONVENTION
    DISPLAY-HINT  "d"
    STATUS        current
    DESCRIPTION
        "The BFD interval in microseconds."
    SYNTAX Unsigned32 (0..4294967295)

    BfdMultiplierTC ::= TEXTUAL-CONVENTION
    DISPLAY-HINT    "d"
    STATUS          current
    DESCRIPTION
        "The BFD failure detection multiplier."
    SYNTAX Unsigned32 (1..255)

    BfdDiagTC ::= TEXTUAL-CONVENTION
    STATUS       current
    DESCRIPTION
        "A common BFD diagnostic code."
    SYNTAX INTEGER {
        noDiagnostic(0),
        controlDetectionTimeExpired(1),
        echoFunctionFailed(2),
        neighborSignaledSessionDown(3),
        forwardingPlaneReset(4),
        pathDown(5),
        concatenatedPathDown(6),
        administrativelyDown(7),
        reverseConcatenatedPathDown(8)
    }

    BfdSessTypeTC ::= TEXTUAL-CONVENTION
    STATUS        current
    DESCRIPTION
        "BFD session type"
    REFERENCE
        "Katz, D. and D. Ward, Bidirectional Forwarding
              Detection (BFD), RFC 5880, June 2010.

         Katz, D. and D. Ward, Bidirectional Forwarding
              Detection (BFD) for IPv4 and IPv6 (Single Hop),
              RFC 5881, June 2010.

         Katz, D. and D. Ward, Bidirectional Forwarding
              Detection (BFD) for Multihop Paths, RFC 5883,
              June 2010."
    SYNTAX INTEGER {
        singleHop(1),
        multiHopTotallyArbitraryPaths(2),
```

```
        multiHopOutOfBandSignaling(3),
        multiHopUnidirectionalLinks(4),
        multiPointHead(5),
        multiPointTail(6)
    }

    BfdSessOperModeTC ::= TEXTUAL-CONVENTION
    STATUS            current
    DESCRIPTION
        "BFD session operating mode"
    REFERENCE
        "Katz, D. and D. Ward, "Bidirectional Forwarding
              Detection (BFD)", RFC 5880, June 2010."
    SYNTAX INTEGER {
        asyncModeWEchoFunction(1),
        asynchModeWOEchoFunction(2),
        demandModeWEchoFunction(3),
        demandModeWOEchoFunction(4)
    }

    BfdCtrlDestPortNumberTC ::= TEXTUAL-CONVENTION
    DISPLAY-HINT            "d"
    STATUS                  current
    DESCRIPTION
        "UDP destination port number of BFD control packets.
         3784 represents single hop BFD session.
         4784 represents multi hop BFD session.
         However, syntax is left open to wider range of values
         purposely for two reasons:
         1. implementation uses non-compliant port number for
            valid proprietary reason.
         2. potential future extension drafts."
    REFERENCE
        "Use of port 3784 from Katz, D. and D. Ward,
              Bidirectional Forwarding
              Detection (BFD) for IPv4 and IPv6 (Single Hop)",
              RFC 5881, June 2010.

         Use of port 4784 from Katz, D. and D. Ward, Bidirectional
              Forwarding Detection (BFD) for IPv4 and IPv6
              (Single Hop), RFC 5881, June 2010."
    SYNTAX Unsigned32 (0..65535)

    BfdCtrlSourcePortNumberTC ::= TEXTUAL-CONVENTION
    DISPLAY-HINT              "d"
    STATUS                    current
    DESCRIPTION
        "UDP source port number of BFD control packets.
```

```
         However, syntax is left open to wider range of values
         purposely for two reasons:
         1. implementation uses non-compliant port number for
            valid proprietary reason.
         2. potential future extension drafts."
    REFERENCE
        "Port 49152..65535 (RFC5881)"
    SYNTAX Unsigned32 (0..65535)

    BfdSessStateTC ::= TEXTUAL-CONVENTION
    STATUS         current
    DESCRIPTION
        "BFD session state. State failing(5) is only applicable if
         corresponding session is running in BFD version 0."
    REFERENCE
        "RFC 5880 - Bidirectional Forwarding Detection (BFD), Katz,
         D., Ward, D., June 2010."
    SYNTAX INTEGER {
        adminDown(1),
        down(2),
        init(3),
        up(4),
        failing(5)
    }

    BfdSessAuthenticationTypeTC ::= TEXTUAL-CONVENTION
    STATUS                      current
    DESCRIPTION
        "BFD authentication type"
    REFERENCE
        "Sections 4.2 - 4.4 from Katz, D. and D. Ward,
         Bidirectional Forwarding Detection (BFD),
         RFC 5880, June 2010."
    SYNTAX INTEGER {
        noAuthentication(-1),
        reserved(0),
        simplePassword(1),
        keyedMD5(2),
        meticulousKeyedMD5(3),
        keyedSHA1(4),
        meticulousKeyedSHA1(5)
    }

    BfdSessionAuthenticationKeyTC ::= TEXTUAL-CONVENTION
    DISPLAY-HINT                   "1x "
    STATUS                         current
    DESCRIPTION
        "BFD authentication key type.
```

```
        A BfdSessionAuthenticationKeyTC is always interpreted within
        the context of an BfdSessAuthenticationTypeTC value.  Every
        usage of the BfdSessionAuthenticationTypeTC textual
        convention is required to specify the
        BfdSessionAuthenticationKeyTC object that provides the
        context.  It is suggested that the
        BfdSessionAuthentcationTypeTC object be logically registered
        before the object(s) that use the
        BfdSessionAuthenticationKeyTC textual convention, if they
        appear in the same logical row.

        The value of a BfdSessionAuthenticationKeyTC must always be
        consistent with the value of the associated
        BfdSessionAuthencationTypeTC object.  Attempts to set a
        BfdSessionAuthenticationKeyTC object to a value inconsistent
        with the associated BfdSessionAuthenticationTypeTC must fail
        with an inconsistentValue error.

        The following size constraints for a
        BfdSessionAuthenticationKeyTC object are defined for the
        associated BfdSessionAuthenticationTypeTC values show below:

        noAuthentication(-1): SIZE(0)
        reserved(0): SIZE(0)
        simplePassword(1): SIZE(1..16)
        keyedMD5(2): SIZE(16)
        meticulousKeyedMD5(3): SIZE(16)
        keyedSHA1(4): SIZE(20)
        meticulousKeyedSHA1(5): SIZE(20)

        When this textual convention is used as the syntax of an
        index object, there may be issues with the limit of 128
        sub-identifiers specified in SMIv2, STD 58.  In this case,
        the object definition MUST include a 'SIZE' clause to limit
        the number of potential instance sub-identifiers; otherwise
        the applicable constraints MUST be stated in the appropriate
        conceptual row DESCRIPTION clauses, or in the surrounding
        documentation if there is no single DESCRIPTION clause that
        is appropriate."
    REFERENCE
        "RFC5880, Sections 4.2 - 4.4"
    SYNTAX OCTET STRING(SIZE(0..252))

    END
```

4. Security Considerations

This module does not define any management objects. Instead, it defines a set of textual conventions which may be used by other BFD MIB modules to define management objects.

Meaningful security considerations can only be written in the MIB modules that define management objects. Therefore, this document has no impact on the security of the Internet.

5. IANA Considerations

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

Descriptor	OBJECT IDENTIFIER value
bfdTCStdMib	{ mib-2 XXX }

[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.]

6. References

6.1. 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.

[RFC5880] Katz, D. and D. Ward, "Bidirectional Forwarding Detection (BFD)", RFC 5880, June 2010.

[RFC5881] Katz, D. and D. Ward, "Bidirectional Forwarding Detection (BFD) for IPv4 and IPv6 (Single Hop)", RFC 5881, June 2010.

[RFC5883] Katz, D. and D. Ward, "Bidirectional Forwarding Detection (BFD) for Multihop Paths", RFC 5883, June 2010.

6.2. 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.

[RFC4001] Daniele, M., Haberman, B., Routhier, S., and J. Schoenwaelder, "Textual Conventions for Internet Network Addresses", RFC 4001, February 2005.

[RFC2863] McCloghrie, K. and F. Kastenholz, "The Interfaces Group MIB", RFC 2863, June 2000.

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

Appendix A. Acknowledgments

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