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T. Nadeau
Juniper Networks
Z. Ali
N. Akiya
Cisco Systems
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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

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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

This MIB module makes references to the following documents. [RFC2579], [RFC2580], [RFC2863], [RFC4001], and [RFC3413].

```

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
        Email: tnadeau@lucidvision.com

        Zafar Ali
        Cisco Systems, Inc.
        Email: zali@cisco.com

        Nobo Akiya
        Cisco Systems, Inc.
        Email: nobo@cisco.com"
    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 BfdSessionAuthencationTypeTC 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

Authors would like to thank David Ward and Jeffrey Haas for their comments and suggestions.

Authors' Addresses

Thomas D. Nadeau
Juniper Networks

EMail: tnadeau@juniper.net

Zafar Ali
Cisco Systems

EMail: zali@cisco.com

Nobo Akiya
Cisco Systems

EMail: nobo@cisco.com