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

Abstract

This document defines two Management Information Base (MIB) modules that contain 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.

Status of This Memo

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1. Introduction

This document defines two MIB modules that contain Textual Conventions for Bidirectional Forwarding Detection (BFD) protocols. These Textual Conventions should be imported by MIB modules that manage BFD protocols.

Note that names of Textual Conventions defined in this document are prefixed with either "Bfd" or "IANA" to make it obvious to readers that some are specific to BFD modules, whereas others are IANA maintained.

For an introduction to the concepts of BFD, see [RFC5880], [RFC5881], [RFC5883], [RFC6428], and [RFC7130].

1.1. 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].

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. BFD Textual Conventions MIB Definitions

This MIB module makes references to the following documents: [RFC2578], [RFC2579], [RFC5880], [RFC5881], [RFC5883], [RFC6428], and [RFC7130].

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

IMPORTS
   MODULE-IDENTITY, mib-2, Unsigned32
   FROM SNMPv2-SMI                               -- RFC 2578
   TEXTUAL-CONVENTION
   FROM SNMPv2-TC;                               -- RFC 2579

bfdTCStdMib MODULE-IDENTITY
   LAST-UPDATED
      "201408120000Z" -- 12 August 2014 00:00:00 GMT
   ORGANIZATION "IETF Bidirectional Forwarding Detection Working Group"
   CONTACT-INFO
      "Thomas D. Nadeau
       Brocade
       Email: tnadeau@lucidvision.com

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

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

      Comments about this document should be emailed directly to the BFD working group mailing list at rtg-bfd@ietf.org"

DESCRIPTION
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   Redistribution and use in source and binary forms, with or without modification, is permitted pursuant to, and subject
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)

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.  
6784 represents BFD on Link Aggregation Group (LAG) 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 documents."
The value of 0 is a special, reserved value used to indicate special conditions and should not be considered a valid port number.

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 6784 from Bhatia, M., Chen, M., Boutros, S., Binderberger, M., and J. Haas, Bidirectional Forwarding Detection (BFD) on Link Aggregation Group (LAG) Interfaces, RFC 7130, February 2014."

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.

The value of 0 is a special, reserved value used to indicate special conditions and should not be considered a valid port number."

REFERENCE

"Port 49152..65535 from RFC5881"

SYNTAX Unsigned32 (0..65535)

END

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

IMPORTS
    MODULE-IDENTITY, mib-2
    FROM SNMPv2-SMI -- RFC 2578
    TEXTUAL-CONVENTION
    FROM SNMPv2-TC; -- RFC 2579

Nadeau, et al. Standards Track
IANAbfdTCStdMib MODULE-IDENTITY
LAST-UPDATED "201408120000Z" -- 12 August 2014 00:00:00 GMT
ORGANIZATION "IANA"
CONTACT-INFO "Internet Assigned Numbers Authority
Postal: 12025 Waterfront Drive, Suite 300
Los Angeles, CA  90094-2536
Tel:    +1 310 301 5800
EMail:  iana@iana.org"

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REVISION "201408120000Z" -- 12 August 2014 00:00:00 GMT
DESCRIPTION "Initial version.  Published as RFC 7330."

::= { mib-2 224 }

IANAbfdDiagTC ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "A common BFD diagnostic code."
REFERENCE
"Katz, D. and D. Ward, Bidirectional Forwarding
Detection (BFD), RFC 5880, June 2010.

Allan, D., Swallow, G., and Drake, J., Proactive Connectivity
Verification, Continuity Check, and Remote Defect
Indication for the MPLS Transport Profile, RFC 6428,
November 2011."

SYNTAX INTEGER {
    noDiagnostic(0),
    controlDetectionTimeExpired(1),
    echoFunctionFailed(2),
}

neighborSignaledSessionDown(3),
forwardingPlaneReset(4),
pathDown(5),
concatenatedPathDown(6),
administrativelyDown(7),
reverseConcatenatedPathDown(8),
misConnectivityDefect(9)
}

IANAbfdSessTypeTC ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION "BFD session type"
REFERENCE


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)
}

IANAbfdSessOperModeTC ::= 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)
}

IANAbfdSessStateTC ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"BFD session state. State failing(5) is only applicable if corresponding session is running in BFD version 0."

REFERENCE

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

SYNTAX INTEGER {
    adminDown(1),
    down(2),
    init(3),
    up(4),
    failing(5)
}

IANAbfdSessAuthenticationTypeTC ::= 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)
}

IANAbfdSessAuthenticationKeyTC ::= TEXTUAL-CONVENTION
DISPLAY-HINT                  "1x "
STATUS                        current
DESCRIPTION
    "BFD authentication key type. An IANAbfdSessAuthenticationKeyTC is always interpreted
    within the context of an IANAbfdSessAuthenticationTypeTC value. Every usage of the
    IANAbfdSessAuthenticationTypeTC textual convention is required to specify the
    IANAbfdSessAuthenticationKeyTC object that provides the context. It is suggested that the
    IANAbfdSessAuthenticationKeyTC object be logically registered before the object(s) that use the
    IANAbfdSessAuthenticationKeyTC textual convention, if they appear in the same logical row."
The value of an IANA bfdSessAuthenticationKeyTC must always be consistent with the value of the associated IANA bfdSessAuthenticationTypeTC object. Attempts to set an IANA bfdSessAuthenticationKeyTC object to a value inconsistent with the associated IANA bfdSessAuthenticationTypeTC must fail with an inconsistentValue error.

The following size constraints for an IANA bfdSessAuthenticationKeyTC object are defined for the associated IANA bfdSessAuthenticationTypeTC 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
"Sections 4.2 - 4.4 from Katz, D. and D. Ward, Bidirectional Forwarding Detection (BFD), RFC 5880, June 2010."

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. This document has therefore no impact on the security of the Internet.
5. IANA Considerations

This document provides the base definition of the IANA-BFD-TC-STD-MIB module. This MIB module is under the direct control of IANA. See Section 3 for the initial contents. See the most updated version of this MIB at <http://www.iana.org/assignments/ianabfdtcstd-mib>. Assignments of IANA-BFD-TC-STD-MIB are via IETF Review [RFC5226].

This MIB makes reference to the following documents: [RFC2578], [RFC2579], [RFC5880], [RFC5881] and [RFC5883], [RFC6428], and [RFC7130].

IANA assigned an OID to the BFD-TC-STD-MIB module specified in this document as { mib-2 223 }.

IANA assigned an OID to the IANA-BFD-TC-STD-MIB module specified in this document as { mib-2 224 }.

6. Acknowledgments

The authors would like to thank Adrian Farrel and Jeffrey Haas for performing thorough reviews and providing a number of suggestions. The authors would also like to thank David Ward and Christer Holmberg for their comments and suggestions.

7. References

7.1. Normative References


7.2. Informative References


Authors’ Addresses

Thomas D. Nadeau
Brocade
EMail: tnadeau@lucidvision.com

Zafar Ali
Cisco Systems
EMail: zali@cisco.com

Nobo Akiya
Cisco Systems
EMail: nobo@cisco.com