Definitions of Managed Objects for Routing Bridges (RBridges)

Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols. In particular, it defines objects for managing a Routing Bridge (RBridge), also known as a TRILL Switch, based on the IETF TRILL (Transparent Interconnection of Lots of Links) protocol.

Status of This Memo

This is an Internet Standards Track document.

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1. Introduction

This document describes a model for managing Routing Bridges (RBridges), also known as TRILL Switches, as defined in [RFC6325]. RBridges provide optimal pair-wise forwarding without configuration using IS-IS routing and encapsulation of traffic. RBridges are compatible with previous IEEE 802.1 customer bridges as well as IPv4 and IPv6 routers and end nodes. They are as invisible to current IP routers as bridges are and, like routers, they terminate the bridge spanning tree protocol. In creating an RBridge management model, the device is viewed primarily as a customer bridge. For a discussion of the problem addressed by TRILL (Transparent Interconnection of Lots of Links), see [RFC5556].
RBridge MIB module is intended as an overall framework for managing R Bridges, also known as TRILL Switches. Where possible, the MIB references existing MIB definitions in order to maximize reuse. This results in a considerable emphasis on the relationship with other MIB modules.

Starting with the physical interfaces, there are requirements for certain elements of the IF-MIB to be implemented. These elements are required in order to connect the per-port parameters to higher-level functions of the physical device.

Transparent bridging, VLANs, traffic classes, and multicast filtering are supported by the TRILL protocol, and the corresponding management is expected to conform to the BRIDGE-MIB module [RFC4188] and to the P-BRIDGE-MIB and Q-BRIDGE-MIB modules [RFC4363].

The IS-IS routing protocol is used in order to determine the optimum pair-wise forwarding path. This protocol is managed using the IS-IS MIB module defined in [RFC4444]. Since the TRILL protocol specifies the use of a single level and a fixed area address of zero, some IS-IS MIB objects are not applicable. Some IS-IS MIB objects are used in the TRILL protocol.
4. Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

5. Structure of the MIB Module

Objects in this MIB module are arranged into subtrees. Each subtree is organized as a set of related objects. The various subtrees are shown below. These are supplemented with required elements of the IF-MIB, ISIS-MIB, BRIDGE-MIB, P-BRIDGE-MIB, Q-BRIDGE-MIB, and IEEE Bridge MIB modules.

5.1. Textual Conventions

Textual conventions are defined to represent object types relevant to TRILL.

5.2. The rbridgeBase Subtree

This subtree contains system- and port-specific objects applicable to all RBridges.

5.3. The rbridgeFdb Subtree

This subtree contains objects applicable to the forwarding database used by the RBridge in making packet-forwarding decisions. Because it contains additional information used by the TRILL protocol not applicable to 802.1D/Q bridges, it is a superset of the corresponding subtrees defined in the BRIDGE-MIB and Q-BRIDGE-MIB.

5.4. The rbridgeVlan Subtree

This subtree describes objects applicable to VLANs configured on the RBridge.

5.5. The rbridgeEsadi Subtree

This subtree describes objects relevant to RBridges that support the optional End-Station Address Distribution Information (ESADI) protocol.

5.6. The rbridgeCounters Subtree

This subtree contains statistics maintained by RBridges that can aid in monitoring and troubleshooting networks connected by them.
5.7. The rbridgeSnooping Subtree

This subtree describes objects applicable to RBridges capable of snooping IPv4 and/or IPv6 multicast control frames and pruning IP multicast traffic based on detection of IP multicast routers and listeners.

5.8. The rbridgeDtree Subtree

This subtree contains objects relevant to distribution trees computed by RBridges for the forwarding of multi-destination frames.

5.9. The rbridgeTrill Subtree

This subtree contains objects applicable to the TRILL IS-IS protocol, beyond what is available in the ISIS-MIB.

5.10. The Notifications Subtree

The defined notifications are focused on the TRILL protocol functionality. Notifications are defined for changes in the Designated RBridge status and the topology.

6. Relationship to Other MIB Modules

The IF-MIB, BRIDGE-MIB, P-BRIDGE-MIB, Q-BRIDGE-MIB, IEEE8021-BRIDGE-MIB, IEEE8021-Q-BRIDGE-MIB, and ISIS-MIB modules all contain objects relevant to the RBridge MIB. Management objects contained in these modules are not duplicated here, to reduce overlap to the extent possible.

The Bridge MIB modules were originally written in the IETF and implemented by many vendors. Per [RFC4663], this has recently been transferred to the IEEE 802.1 working group. As vendors may have implemented either the IETF or IEEE Bridge MIB modules, this RBridge MIB module is designed to work with either one.

6.1. Relationship to IF-MIB

The port identification elements MUST be implemented in order to allow them to be cross-referenced. The Interfaces MIB [RFC2863] requires that any MIB module that is an adjunct of the Interfaces MIB clarify specific areas within the Interfaces MIB module. These areas were intentionally left vague in the Interfaces MIB module to avoid over-constraining the MIB, thereby precluding management of certain media types. Section 4 of [RFC2863] enumerates several areas that a
media-specific MIB module must clarify. The implementor is referred to [RFC2863] in order to understand the general intent of these areas.

6.2. Relationship to BRIDGE-MIB

The following subtrees in the BRIDGE-MIB [RFC4188] contain information relevant to RBridges when the corresponding functionality is implemented.

- dot1dBase
- dot1dTp
- dot1dStatic

6.3. Relationship to P-BRIDGE-MIB

The following subtrees in the P-BRIDGE-MIB [RFC4363] contain information relevant to RBridges when the corresponding functionality is implemented.

- dot1dExtBase
- dot1dPriority
- dot1dGarp
- dot1dGmrp
- dot1dTpHCPortTable
- dot1dTpPortOverflowTable

6.4. Relationship to Q-BRIDGE-MIB

The following groups in the Q-BRIDGE-MIB [RFC4363] contain information relevant to RBridges when the corresponding functionality is implemented. This functionality is also contained in the IEEE8021-Q-BRIDGE-MIB.

- dot1qBase
- dot1qTp
- dot1qStatic
o  dot1qVlan
o  dot1vProtocol

6.5. Relationship to IEEE8021-BRIDGE-MIB

The following subtrees in the IEEE8021-BRIDGE-MIB contain information relevant to RBridges when the corresponding functionality is implemented.

o  ieee8021BridgeBase
o  ieee8021BridgeTp
o  ieee8021BridgePriority
o  ieee8021BridgeMrp
o  ieee8021BridgeMmrp
o  ieee8021BridgeInternalLan
o  ieee8021BridgeDot1d

6.6. Relationship to IEEE8021-Q-BRIDGE-MIB

The following subtrees in the IEEE8021-Q-BRIDGE-MIB contain information relevant to RBridges when the corresponding functionality is implemented.

o  ieee8021QBridgeBase
o  ieee8021QBridgeTp
o  ieee8021QBridgeStatic
o  ieee8021QBridgeVlan
o  ieee8021QBridgeProtocol
6.7. Relationship to ISIS-MIB

"Management Information Base for Intermediate System to Intermediate System (IS-IS)" [RFC4444] defines a MIB module for the IS-IS routing protocol when it is used to construct routing tables for IP networks. While most of these objects are applicable to the TRILL layer 2 implementation, note the IS-IS constraints for the current version of TRILL [RFC6325]:

- The TRILL IS-IS instance uses a single Level 1 IS-IS area.
- The TRILL Level 1 IS-IS area uses the fixed area address zero.
- The TRILL IS-IS instance is not used for IP address advertisement.
- The TRILL IS-IS instance is used for only a single protocol: TRILL.

Accordingly, tables that report IP address reachability and tables that allow configuration or reporting of multiple IS-IS areas, multiple IS-IS levels, or multiple protocols will be empty in the ISIS-MIB module for the current version of TRILL.

Note also that when more than one instance of the IS-IS protocol is running on a device, as in the case of a device performing both RBridge and IS-IS IP router functions, multiple instances of the ISIS-MIB module can be distinguished by the use of SNMPv3 contexts or SNMPv1 communities.

6.8. MIB Modules Required for IMPORTS

The following MIB module imports objects from the SNMPv2-SMI [RFC2578], SNMPv2-TC [RFC2579], SNMPv2-CONF [RFC2580], IF-MIB [RFC2863], INET-ADDRESS-MIB [RFC4001], BRIDGE-MIB [RFC4188], and Q-BRIDGE-MIB [RFC4363]. (The IEEE Bridge MIB modules import similar TCs.)
7. Definition of the RBridge MIB Module

RBRIDGE-MIB DEFINITIONS ::= BEGIN

-- ---------------------------------------------------------- --
-- MIB for RBRIDGE devices, also known as TRILL Switches
-- ---------------------------------------------------------- --
IMPORTS

   MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,
   Counter32, Counter64, Unsigned32, mib-2
   FROM SNMPv2-SMI            -- RFC2578
   TEXTUAL-CONVENTION, TruthValue, MacAddress, RowStatus
   FROM SNMPv2-TC             -- RFC2579
   MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
   FROM SNMPv2-CONF           -- RFC2580
   VlanId, PortList
   FROM Q-BRIDGE-MIB          -- RFC4363
   InetAddress, InetAddressType
   FROM INET-ADDRESS-MIB      -- RFC4001
   BridgeId
   FROM BRIDGE-MIB            -- RFC4188
   InterfaceIndex
   FROM IF-MIB                -- RFC2863
;

rbridgeMIB MODULE-IDENTITY
LAST-UPDATED "201301070000Z"
ORGANIZATION "IETF TRILL Working Group"
CONTACT-INFO
   "http://datatracker.ietf.org/wg/trill/charter/
    Email: trill@ietf.org

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DESCRIPTION
   "The RBridge MIB module for managing switches that support
the TRILL protocol."

REVISION     "201301070000Z"
DESCRIPTION

"Initial version, published as RFC 6850.

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::= { mib-2 214 }

-- Subtrees in the RBridge MIB

-- Type Definitions

RbridgeAddress ::= TEXTUAL-CONVENTION
   DISPLAY-HINT "1x:"
   STATUS current
   DESCRIPTION
      "The Media Access Control (MAC) address used by an RBridge port. This may match the RBridge IS-IS SystemID."
   SYNTAX OCTET STRING (SIZE (6))
RbridgeNickname ::= TEXTUAL-CONVENTION
DISPLAY-HINT "d"
STATUS current
DESCRIPTION
"The 16-bit identifier used in TRILL as an abbreviation for the RBridge’s 48-bit IS-IS System ID. The value 0 means a nickname is not specified, the values 0xFFFFC0 through 0xFFFFFE are reserved for future allocation, and the value 0xFFFFF is permanently reserved."
REFERENCE
"RFC 6325, Section 3.7"
SYNTAX Unsigned32 (0..65471)

--
-- the rbridgeBase subtree
--
-- Implementation of the rbridgeBase subtree is mandatory for all -- RBridges.
--

rbridgeBaseTrillVersion OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The maximum TRILL version number that this RBridge supports."
REFERENCE
"RFC 6325, Section 3.2"
::= { rbridgeBase 1 }

rbridgeBaseNumPorts OBJECT-TYPE
SYNTAX      Unsigned32
UNITS       "ports"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The number of ports controlled by this RBridge."
REFERENCE
"RFC 6325, Section 2.6.1"
::= { rbridgeBase 2 }

rbridgeBaseForwardDelay OBJECT-TYPE
SYNTAX      Unsigned32 (4..30)
UNITS       "seconds"
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
"Modified aging time for address entries after an appointed
forwarder change.

The value of this object MUST be retained across
re-initializations of the management system."
REFERENCE
"RFC 6325, Section 4.8.3"
 ::= { rbridgeBase 3 }

rbridgeBaseUniMultipathEnable OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The enabled status of unicast TRILL multipathing.
It is enabled when true.

The value of this object MUST be retained across
re-initializations of the management system."
REFERENCE
"RFC 6325, Appendix C"
 ::= { rbridgeBase 4 }

rbridgeBaseMultiMultipathEnable OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"The enabled status of multi-destination TRILL multipathing.
It is enabled when true.

The value of this object MUST be retained across
re-initializations of the management system."
REFERENCE
"RFC 6325, Appendix C"
 ::= { rbridgeBase 5 }

rbridgeBaseAcceptEncapNonadj OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Accept TRILL-encapsulated frames from a neighbor with which
this RBridge does not have an IS-IS adjacency, when the value
of this object is ‘true’."
The value of this object MUST be retained across re-initializations of the management system.

REFERENCE
"RFC 6325, Section 4.6.2"
::= { rbridgeBase 6 }

rbridgeBaseNicknameNumber OBJECT-TYPE
SYNTAX      Unsigned32 (1..256)
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
"The number of nicknames this RBridge should acquire. These can be acquired dynamically or configured statically. This value represents the maximum number of entries in rbridgeBaseNicknameTable. The value of this object MUST be retained across re-initializations of the management system."
REFERENCE
"RFC 6325, Section 3.7.3"
::= { rbridgeBase 7 }

-- ---------------------------------------------------------- --
-- The RBridge Base Nickname Table
-- ---------------------------------------------------------- --

rbridgeBaseNicknameTable OBJECT-TYPE
SYNTAX      SEQUENCE OF RbridgeBaseNicknameEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"A table that contains information about nicknames configured by an operator or learned dynamically by this RBridge."
REFERENCE
"RFC 6325, Section 3.7"
::= { rbridgeBase 8 }

rbridgeBaseNicknameEntry OBJECT-TYPE
SYNTAX      RbridgeBaseNicknameEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"A list of information for each nickname of the RBridge."
REFERENCE
"RFC 6325, Section 3.7"
INDEX  { rbridgeBaseNicknameName }
::= { rbridgeBaseNicknameTable 1 }
RbridgeBaseNicknameEntry ::=  
   SEQUENCE {
      rbridgeBaseNicknameName       RbridgeNickname,
      rbridgeBaseNicknamePriority      Unsigned32,
      rbridgeBaseNicknameDtrPriority     Unsigned32,
      rbridgeBaseNicknameType       INTEGER,
      rbridgeBaseNicknameRowStatus    RowStatus
   }

rbridgeBaseNicknameName OBJECT-TYPE
   SYNTAX       RbridgeNickname
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION  "Nicknames are 16-bit quantities that act as abbreviations for RBridge’s 48-bit IS-IS System ID to achieve a more compact encoding."
   REFERENCE    "RFC 6325, Section 3.7"
   ::= { rbridgeBaseNicknameEntry 1 }

rbridgeBaseNicknamePriority OBJECT-TYPE
   SYNTAX      Unsigned32 (0..255)
   MAX-ACCESS read-create
   STATUS      current
   DESCRIPTION  "This RBridge’s priority to hold this nickname. When the nickname is configured, the default value of this object is 192. When the nickname is configured, the most significant bit (0x80) must be set and the bottom 7 bits have the default value of 0x40, so 0x80 + 0x40 == 0xC0, which is 192 decimal. Additionally, the bottom 7 bits could be configured to a value other than 0x40. The value of this object MUST be retained across re-initializations of the management system."
   REFERENCE    "RFC 6325, Section 3.7"
   DEFVAL      { 192 }
   ::= { rbridgeBaseNicknameEntry 2 }
rbridgeBaseNicknameDtrPriority OBJECT-TYPE
SYNTAX       Unsigned32 (1..65535)
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
"The distribution tree root priority for this nickname.
The default value of this object is 32768.
The value of this object MUST be retained across
re-initializations of the management system."
REFERENCE
"RFC 6325, Section 4.5"
DEFVAL       { 32768 }
::= { rbridgeBaseNicknameEntry 3 }

rbridgeBaseNicknameType OBJECT-TYPE
SYNTAX       INTEGER {
                      static(1),
                      dynamic(2)
                  }
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
"This object indicates the status of the entry. The
default value is static(1).
static(1) - this entry has been configured and
will remain after the next reset of the RBridge.
dynamic(2) - this entry has been acquired by the
RBridge nickname acquisition protocol."
REFERENCE
"RFC 6325, Section 3.7"
DEFVAL       { static }
::= { rbridgeBaseNicknameEntry 4 }

rbridgeBaseNicknameRowStatus OBJECT-TYPE
SYNTAX       RowStatus
MAX-ACCESS   read-create
STATUS       current
DESCRIPTION
"This object indicates the status of the entry."
::= { rbridgeBaseNicknameEntry 5 }
-- The RBridge Port Table
-- ---------------------------------------------------------- --

rbridgeBasePortTable OBJECT-TYPE
SYNTAX      SEQUENCE OF RbridgeBasePortEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "A table that contains generic information about every
port that is associated with this RBridge."
REFERENCE    "RFC 6325, Section 5.3"
::= { rbridgeBase 9 }

rbridgeBasePortEntry OBJECT-TYPE
SYNTAX      RbridgeBasePortEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION  "A list of information for each port of the bridge."
REFERENCE    "RFC 6325, Section 5.3"
INDEX      { rbridgeBasePort }
::= { rbridgeBasePortTable 1 }

RbridgeBasePortEntry ::= SEQUENCE {
    rbridgeBasePort       Unsigned32,
    rbridgeBasePortIfIndex InterfaceIndex,
    rbridgeBasePortDisable TruthValue,
    rbridgeBasePortTrunkPort TruthValue,
    rbridgeBasePortAccessPort TruthValue,
    rbridgeBasePortP2pHellos TruthValue,
    rbridgeBasePortState   INTEGER,
    rbridgeBasePortInhibitionTime Unsigned32,
    rbridgeBasePortDisableLearning TruthValue,
    rbridgeBasePortDesiredDesigVlan VlanId,
}
rbridgeBasePortDesigVlan
  VlanId,
rbridgeBasePortStpRoot
  BridgeId,
rbridgeBasePortStpRootChanges
  Counter32,
rbridgeBasePortStpWiringCloset
  BridgeId
}

rbridgeBasePort OBJECT-TYPE
SYNTAX     Unsigned32 (1..65535)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
  "The port number of the port for which this entry
  contains RBridge management information."
REFERENCE
  "RFC 6325, Section 5.3"
 ::= { rbridgeBasePortEntry 1 }

rbridgeBasePortIfIndex OBJECT-TYPE
SYNTAX     InterfaceIndex
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
  "The value of the instance of the ifIndex object,
  defined in the IF-MIB, for the interface corresponding
  to this port. The RBridge port sits on top of
  this interface."
 ::= { rbridgeBasePortEntry 2 }

rbridgeBasePortDisable OBJECT-TYPE
SYNTAX     TruthValue
MAX-ACCESS read-write
STATUS      current
DESCRIPTION
  "Disable port bit. When this bit is set (true), all frames
  received or to be transmitted are discarded, with the
  possible exception of some layer 2 control frames that may
  be generated and transmitted or received and processed
  locally. Default value is 'false'.

  The value of this object MUST be retained across
  re-initializations of the management system."
REFERENCE
   "RFC 6325, Section 4.9.1"
DEFVAL   { false }
::= { rbridgeBasePortEntry 3 }

rbridgeBasePortTrunkPort OBJECT-TYPE
SYNTAX   TruthValue
MAX-ACCESS read-write
STATUS   current
DESCRIPTION
   "End-station service disable (trunk port) bit. When this bit is set (true), all native frames received on the port and all native frames that would have been sent on the port are discarded. Default value is 'false'.

   The value of this object MUST be retained across re-initializations of the management system."
REFERENCE
   "RFC 6325, Section 4.9.1"
DEFVAL   { false }
::= { rbridgeBasePortEntry 4 }

rbridgeBasePortAccessPort OBJECT-TYPE
SYNTAX   TruthValue
MAX-ACCESS read-write
STATUS   current
DESCRIPTION
   "TRILL traffic disable (access port) bit. If this bit is set, the goal is to avoid sending any TRILL frames, except TRILL-Hello frames, on the port, since it is intended only for native end-station traffic. This ensures that the link is not on the shortest path for any destination. Default value is 'false'.

   The value of this object MUST be retained across re-initializations of the management system."
REFERENCE
   "RFC 6325, Section 4.9.1"
DEFVAL   { false }
::= { rbridgeBasePortEntry 5 }

rbridgeBasePortP2pHellos OBJECT-TYPE
SYNTAX   TruthValue
MAX-ACCESS read-write
STATUS   current
DESCRIPTION
   "Use point-to-point (P2P) Hellos bit. If this bit is set, Hellos sent on this port are IS-IS P2P Hellos, not the
default TRILL-Hellos. In addition, the IS-IS P2P three-way handshake is used on P2P RBridge links. Default value is 'false'.

The value of this object MUST be retained across re-initializations of the management system.

REFERENCE
"RFC 6325, Section 4.9.1"
DEFVAL { false }
::= { rbridgeBasePortEntry 6 }

rbridgeBasePortState OBJECT-TYPE
SYNTAX INTEGER {
  uninhibited(1),
  portInhibited(2),
  vlanInhibited(3),
  disabled(4),
  broken(5)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The port’s current state. If the entire port is inhibited, its state is portInhibited(2). If specific VLANs are inhibited, the state is vlanInhibited(3), and rbridgeVlanPortTable will tell which VLANs are inhibited. For ports that are disabled (see rbridgeBasePortDisable), this object will have a value of disabled(4). If the RBridge has detected a port that is malfunctioning, it will place that port into the broken(5) state."

REFERENCE
"RFC 6325, Section 4.2.4.3"
::= { rbridgeBasePortEntry 7 }

rbridgeBasePortInhibitionTime OBJECT-TYPE
SYNTAX Unsigned32
UNITS "seconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"Time in seconds that this RBridge will inhibit forwarding on this port after it observes a spanning tree root bridge change on a link or receives conflicting VLAN forwarder information. The default value is 30.

The value of this object MUST be retained across re-initializations of the management system."
REFERENCE
   "RFC 6325, Section 4.2.4.3"
DEFVAL  \{ 30 \}
::= \{ rbridgeBasePortEntry 8 \}

rbridgeBasePortDisableLearning OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
   "Disable learning of MAC addresses seen on this port. To disable
   learning, the value of this object must be set to 'true'. The default
   is 'false'.

   The value of this object MUST be retained across re-initializations
   of the management system."
REFERENCE
   "RFC 6325, Section 4.8"
DEFVAL  \{ false \}
::= \{ rbridgeBasePortEntry 9 \}

rbridgeBasePortDesiredDesigVlan OBJECT-TYPE
SYNTAX      VlanId
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
   "The VLAN that a Designated RBridge (DRB) will specify in its
   TRILL-Hellos as the VLAN to be used by all RBridges on the link
   for TRILL frames. This VLAN must be enabled on this port.

   The value of this object MUST be retained across re-initializations
   of the management system."
REFERENCE
   "RFC 6325, Section 4.4.3"
::= \{ rbridgeBasePortEntry 10 \}

rbridgeBasePortDesigVlan OBJECT-TYPE
SYNTAX      VlanId
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "The VLAN being used on this link for TRILL frames."
REFERENCE
   "RFC 6325, Section 4.4.3"
::= \{ rbridgeBasePortEntry 11 \}
rbridgeBasePortStpRoot OBJECT-TYPE
SYNTAX       BridgeId
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  "The bridge identifier of the root of the spanning tree, as learned from a Bridge PDU (BPDU) received on this port. For the Multiple Spanning Tree Protocol (MSTP), this is the root bridge of the Common and Internal Spanning Tree (CIST). If no BPDU has been heard, the value returned is a string of zeros."
REFERENCE    "RFC 6325, Section 4.2.4.3"
 ::= { rbridgeBasePortEntry 12 }

rbridgeBasePortStpRootChanges OBJECT-TYPE
SYNTAX       Counter32
UNITS        "changes"
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  "The number of times a change in the root bridge is seen from spanning tree BPDUs received on this port, indicating a change in bridged LAN topology. Each such change may cause the port to be inhibited for a period of time. This counter should be synchronized with ifCounterDiscontinuityTime. Discontinuities in the value of this counter can occur at re-initialization of the management system."
REFERENCE    "RFC 6325, Section 4.9.3.2"
 ::= { rbridgeBasePortEntry 13 }

rbridgeBasePortStpWiringCloset OBJECT-TYPE
SYNTAX       BridgeId
MAX-ACCESS   read-write
STATUS       current
DESCRIPTION  "The Bridge ID to be used as the spanning tree root in BPDUs sent for the Wiring Closet topology solution described in [RFC6325]. Note that the same value of this object must be set on all RBridge ports participating in this solution. The default value is all 0s. A non-zero value configured into this object indicates that this solution is in use.

The value of this object MUST be retained across re-initializations of the management system."
REFERENCE
   "RFC 6325, Appendix A.3.3"
 ::= { rbridgeBasePortEntry 14 }

-- -------------------------------------------------------------
-- RBridge Forwarding Database
-- -------------------------------------------------------------

rbridgeConfidenceNative OBJECT-TYPE
 SYNTAX       Unsigned32 (0..255)
 MAX-ACCESS   read-write
 STATUS       current
 DESCRIPTION   "The confidence level associated with MAC addresses
learned from native frames. This is applicable to
all RBridge ports.

The value of this object MUST be retained across
re-initializations of the management system."
REFERENCE
   "RFC 6325, Section 4.8.1"
 ::= { rbridgeFdb 1 }

rbridgeConfidenceDecap OBJECT-TYPE
 SYNTAX       Unsigned32 (0..255)
 MAX-ACCESS   read-write
 STATUS       current
 DESCRIPTION   "The confidence level associated with inner MAC addresses
learned after decapsulation of a TRILL data frame.
This is applicable to all RBridge ports.

The value of this object MUST be retained across
re-initializations of the management system."
REFERENCE
   "RFC 6325, Section 4.8.1"
 ::= { rbridgeFdb 2 }

rbridgeConfidenceStatic OBJECT-TYPE
 SYNTAX       Unsigned32 (0..255)
 MAX-ACCESS   read-write
 STATUS       current
 DESCRIPTION   "The confidence level associated with MAC addresses that
are statically configured. The default value is 255.

The value of this object MUST be retained across
re-initializations of the management system."
MULTIPLE FORWARDING DATABASES FOR RBRIDGES

This allows for an instance per FdbId, as defined in the Bridge MIB.

Each VLAN may have an independent FDB, or multiple VLANs may share one.

---

rbridgeUniFdbTable OBJECT-TYPE
SYNTAX     SEQUENCE OF RbridgeUniFdbEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"A table that contains information about unicast entries for which the device has forwarding and/or filtering information. This information is used by the transparent bridging function in determining how to propagate a received frame."
REFERENCE
"RFC 6325, Section 4.8"
::= { rbridgeFdb 4 }

rbridgeUniFdbEntry OBJECT-TYPE
SYNTAX     RbridgeUniFdbEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"Information about a specific unicast MAC address for which the RBridge has some forwarding and/or filtering information."
INDEX   { rbridgeFdbId, rbridgeUniFdbAddr }
::= { rbridgeUniFdbTable 1 }

RbridgeUniFdbEntry ::= SEQUENCE {
  rbridgeFdbId
    Unsigned32,
  rbridgeUniFdbAddr
    MacAddress,
rbridgeUniFdbPort
    Unsigned32,
rbridgeUniFdbNickname
    RbridgeNickname,
rbridgeUniFdbConfidence
    Unsigned32,
rbridgeUniFdbStatus
    INTEGER
}

rbridgeFdbId OBJECT-TYPE
SYNTAX       Unsigned32 (0..4294967295)
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION  "The identity of this Filtering Database."
 ::= { rbridgeUniFdbEntry 1 }

rbridgeUniFdbAddr OBJECT-TYPE
SYNTAX       MacAddress
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION  "A unicast MAC address for which the device has
forwarding information."
 ::= { rbridgeUniFdbEntry 2 }

rbridgeUniFdbPort OBJECT-TYPE
SYNTAX       Unsigned32 (0..65535)
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  "Either the value ‘0’, or the RBridge port number of the
port on which a frame having a source address equal to the
value of the corresponding instance of rbridgeUniFdbAddr
has been seen. A value of ‘0’ indicates that the port
number has not been learned but that the device does have
some information about this MAC address.

Implementors are encouraged to assign the port value to
this object whenever it is available, even for addresses
for which the corresponding value of rbridgeUniFdbStatus is
not learned(3)."
 ::= { rbridgeUniFdbEntry 3 }

rbridgeUniFdbNickname OBJECT-TYPE
SYNTAX       RbridgeNickname
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
"The RBridge nickname that is placed in the egress nickname field of a TRILL frame sent to this rbridgeFdbAddress in this rbridgeFdbId."
REFERENCE
"RFC 6325, Section 4.8.1"
::= { rbridgeUniFdbEntry 4 }

rbridgeUniFdbConfidence OBJECT-TYPE
SYNTAX      Unsigned32 (0..255)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The confidence level associated with this entry."
REFERENCE
"RFC 6325, Section 4.8.1"
::= { rbridgeUniFdbEntry 5 }

rbridgeUniFdbStatus OBJECT-TYPE
SYNTAX      INTEGER {
    other(1),
    invalid(2),
    learned(3),
    self(4),
    mgmt(5),
    esadi(6)
}
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The status of this entry. The meanings of the values are:
other(1) - none of the following.
invalid(2) - this entry is no longer valid (e.g., it was learned but has since aged out) but has not yet been flushed from the table.
learned(3) - the information in this entry was learned and is being used.
single(4) - the value of the corresponding instance of rbridgeFdbAddress represents one of the device’s addresses. The corresponding instance of rbridgeFdbPort indicates which of the device’s ports has this address."
mgmt(5) - the value of the corresponding instance of
  rbridgeFdbAddress was configured by management.
esadi(6) - the value of the corresponding instance of
  rbridgeFdbAddress was learned from ESADI."
::= { rbridgeUniFdbEntry 6 }

-- RBridge Forwarding Information Base (FIB)

rbridgeUniFibTable OBJECT-TYPE
  SYNTAX      SEQUENCE OF RbridgeUniFibEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "A table that contains information about nicknames known by
    the RBridge. If Equal-Cost Multipath (ECMP) is implemented,
    there are as many entries for a nickname as there are ECMP
    paths available for it."
::= { rbridgeFdb 5 }

rbridgeUniFibEntry OBJECT-TYPE
  SYNTAX      RbridgeUniFibEntry
  MAX-ACCESS  not-accessible
  STATUS      current
  DESCRIPTION
    "A list of information about nicknames known by the RBridge.
    If ECMP is implemented, there are as many entries as there
    are ECMP paths available for a given nickname."
  INDEX   { rbridgeUniFibNickname, rbridgeUniFibPort,
                rbridgeUniFibNextHop }
::= { rbridgeUniFibTable 1 }

RbridgeUniFibEntry ::==
  SEQUENCE {
    rbridgeUniFibNickname
      RbridgeNickname,
    rbridgeUniFibPort
      Unsigned32,
    rbridgeUniFibNextHop
      RbridgeNickname,
    rbridgeUniFibHopCount
      Unsigned32
  }

rbridgeUniFibNickname OBJECT-TYPE
  SYNTAX      RbridgeNickname
  MAX-ACCESS  not-accessible

STATUS  current
DESCRIPTION
  "An RBridge nickname for which this RBridge has
  forwarding information."
::= { rbridgeUniFibEntry 1 }

rbridgeUniFibPort OBJECT-TYPE
SYNTAX  Unsigned32 (0..65535)
MAX-ACCESS  not-accessible
STATUS  current
DESCRIPTION
  "The RBridge port number of the port attached to the
  next-hop RBridge for the path towards the RBridge whose
  nickname is specified in this entry."
::= { rbridgeUniFibEntry 2 }

rbridgeUniFibNextHop OBJECT-TYPE
SYNTAX  RbridgeNickname
MAX-ACCESS  not-accessible
STATUS  current
DESCRIPTION
  "The nickname of the next-hop RBridge for the path
  towards the RBridge whose nickname is specified in this
  entry."
::= { rbridgeUniFibEntry 3 }

rbridgeUniFibHopCount OBJECT-TYPE
SYNTAX  Unsigned32
MAX-ACCESS  read-only
STATUS  current
DESCRIPTION
  "The hop count from this ingress RBridge to the egress
  RBridge whose nickname is specified in
  rbridgeUniFibNickname."
::= { rbridgeUniFibEntry 4 }

rbridgeMultiFibTable OBJECT-TYPE
SYNTAX  SEQUENCE OF RbridgeMultiFibEntry
MAX-ACCESS  not-accessible
STATUS  current
DESCRIPTION
  "A table that contains information about egress nicknames
  used for multi-destination frame forwarding by this
  RBridge."
::= { rbridgeFdb 6 }
rbridgeMultiFibEntry OBJECT-TYPE
SYNTAX    RbridgeMultiFibEntry
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
   "A list of information about egress nicknames used for
   multi-destination frame forwarding by this RBridge."
INDEX   { rbridgeMultiFibNickname }
::= { rbridgeMultiFibTable 1 }

RbridgeMultiFibEntry ::= 
   SEQUENCE { 
      rbridgeMultiFibNickname     RbridgeNickname,
      rbridgeMultiFibPorts        PortList
   }

rbridgeMultiFibNickname OBJECT-TYPE
SYNTAX    RbridgeNickname
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION
   "The nickname of the multicast distribution tree."
::= { rbridgeMultiFibEntry 1 }

rbridgeMultiFibPorts OBJECT-TYPE
SYNTAX    PortList
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
   "The list of ports to which a frame destined to this
   multicast distribution tree is flooded. This may be pruned
   further based on other forwarding information."
::= { rbridgeMultiFibEntry 2 }
-- The RBridge VLAN Table
-- ---------------------------------------------------------- --

rbridgeVlanTable OBJECT-TYPE
SYNTAX       SEQUENCE OF RbridgeVlanEntry
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION  "A table that contains information about VLANs on the
             RBridge."
::= { rbridgeVlan 1 }

rbridgeVlanEntry OBJECT-TYPE
SYNTAX       RbridgeVlanEntry
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION  "A list of information about VLANs on the RBridge."
INDEX        { rbridgeVlanIndex }
::= { rbridgeVlanTable 1 }

RbridgeVlanEntry ::= SEQUENCE {
    rbridgeVlanIndex
        Unsigned32,
    rbridgeVlanForwarderLosts
        Counter32,
    rbridgeVlanDisableLearning
        TruthValue,
    rbridgeVlanSnooping
        INTEGER
}

rbridgeVlanIndex OBJECT-TYPE
SYNTAX       Unsigned32 (1..4094|4096..4294967295)
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION  "The VLAN-ID referring to this VLAN."
::= { rbridgeVlanEntry 1 }

rbridgeVlanForwarderLosts OBJECT-TYPE
SYNTAX       Counter32
UNITS        "times"
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
"The number of times this RBridge has lost appointed
forwarder status for this VLAN on any of its ports.

Discontinuities in the value of this counter can occur
at re-initialization of the management system."

REFERENCE
"RFC 6325, Section 4.8.3"
::= { rbridgeVlanEntry 2 }

rbridgeVlanDisableLearning OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
"Disable learning of MAC addresses seen in this VLAN.
One application of this may be to restrict learning to
ESADI. To disable learning, the value of this object
should be set to 'true'. The default is 'false'.

The value of this object MUST be retained across
re-initializations of the management system."

REFERENCE
"RFC 6325, Section 4.8"
DEFVAL      { false }
::= { rbridgeVlanEntry 3 }

rbridgeVlanSnooping OBJECT-TYPE
SYNTAX      INTEGER {
    notSupported(1),
    ipv4(2),
    ipv6(3),
    ipv4v6(4)
}
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"IP Multicast Snooping on this VLAN. For RBridges
performing both IPv4 and IPv6 IP Multicast Snooping, the
value returned is ipv4v6(4)."

REFERENCE
"RFC 6325, Section 4.7"
::= { rbridgeVlanEntry 4 }

Rijhsinghani & Zebrose       Standards Track                   [Page 30]
The RBridge VLAN Port Table

<table>
<thead>
<tr>
<th>rbridgeVlanPortTable OBJECT-TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYNTAX</td>
</tr>
<tr>
<td>MAX-ACCESS</td>
</tr>
<tr>
<td>STATUS</td>
</tr>
<tr>
<td>DESCRIPTION</td>
</tr>
</tbody>
</table>
| "A table that contains information about VLANs on an RBridge port."
| ::= { rbridgeVlan 2 } |

<table>
<thead>
<tr>
<th>rbridgeVlanPortEntry OBJECT-TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYNTAX</td>
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<td>MAX-ACCESS</td>
</tr>
<tr>
<td>STATUS</td>
</tr>
<tr>
<td>DESCRIPTION</td>
</tr>
</tbody>
</table>
| "A list of information about VLANs on the RBridge port."
| INDEX | { rbridgeBasePort, rbridgeVlanIndex } |
| ::= | { rbridgeVlanPortTable 1 } |

RbridgeVlanPortEntry ::= |
| SEQUENCE | { |
| rbridgeVlanPortInhibited |
| TruthValue, |
| rbridgeVlanPortForwarder |
| TruthValue, |
| rbridgeVlanPortAnnouncing |
| TruthValue, |
| rbridgeVlanPortDetectedVlanMapping |
| TruthValue |
| } |

rbridgeVlanPortInhibited OBJECT-TYPE |
| SYNTAX | TruthValue |
| MAX-ACCESS | read-only |
| STATUS | current |
| DESCRIPTION |
| "This VLAN has been inhibited by the RBridge due to conflicting forwarder information received from another RBridge, when the value of this object is ‘true’."
| REFERENCE |
| "RFC 6325, Section 4.2.4.3" |
| ::= | { rbridgeVlanPortEntry 1 } |

rbridgeVlanPortForwarder OBJECT-TYPE |
| SYNTAX | TruthValue |

Rijhsinghani & Zebrose Standards Track
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "This RBridge is an appointed forwarder for this VLAN
on this port, when the value of this object is 'true'.'"
REFERENCE    "RFC 6325, Section 4.2.4.3"
 ::= { rbridgeVlanPortEntry 2 }

rbridgeVlanPortAnnouncing OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION  "TRILL-Hellos tagged with this VLAN can be sent by this
RBridge on this port, when the value of this object
is 'true'.

The value of this object MUST be retained across
re-initializations of the management system."
REFERENCE    "RFC 6325, Section 4.4.3"
DEFVAL      { true }
 ::= { rbridgeVlanPortEntry 3 }

rbridgeVlanPortDetectedVlanMapping OBJECT-TYPE
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION  "VLAN mapping has been detected on the link attached
to this port, when the value of this object is 'true'."
REFERENCE    "RFC 6325, Section 4.4.5"
 ::= { rbridgeVlanPortEntry 4 }

-- ---------------------------------------------------------- --
-- The RBridge Port Counter Table
--
-- These counters supplement counters in the Bridge MIB.
--
-- For example, total frames received by a bridge port and total
-- frames transmitted by a bridge port are reported in the
-- Port In Frames and Port Out Frames counters of the Bridge MIB.
-- These total bridge frame counters include native as well as
-- encapsulated frames.
--
-- As another example, frames discarded due to excessive frame
-- size are reported in the port counter MTU Exceeded Discards
-- in the Bridge MIB.
-- ---------------------------------------------------------- --

rbridgePortCounterTable OBJECT-TYPE
SYNTAX      SEQUENCE OF RbridgePortCounterEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"A table that contains per-port counters for this RBridge."
::= { rbridgeCounter 1 }

rbridgePortCounterEntry OBJECT-TYPE
SYNTAX      RbridgePortCounterEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"Counters for a port on this RBridge."
INDEX   { rbridgeBasePort }
 ::= { rbridgePortCounterTable 1 }

RbridgePortCounterEntry ::= SEQUENCE {
  rbridgePortRpfCheckFails            Counter32,
  rbridgePortHopCountExceeds         Counter32,
  rbridgePortOptionDrops             Counter32,
  rbridgePortTrillInFrames           Counter64,
  rbridgePortTrillOutFrames          Counter64
}

rbridgePortRpfCheckFails OBJECT-TYPE
SYNTAX      Counter32
UNITS       "frames"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The number of times a multi-destination frame was
dropped on this port because the Reverse Path Forwarding
(RPF) check failed.

Discontinuities in the value of this counter can occur
at re-initialization of the management system, and at
other times as indicated by the value of the
ifCounterDiscontinuityTime object of the associated
interface."
REFERENCE
"RFC 6325, Section 4.5.2"
::= { rbridgePortCounterEntry 1 }

rbridgePortHopCountExceeds OBJECT-TYPE
SYNTAX      Counter32
UNITS       "frames"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The number of times a frame was dropped on this port
because its hop count was zero.

Discontinuities in the value of this counter can occur
at re-initialization of the management system, and at
other times as indicated by the value of the
ifCounterDiscontinuityTime object of the associated
interface."
REFERENCE
"RFC 6325, Section 3.6"
::= { rbridgePortCounterEntry 2 }

rbridgePortOptionDrops OBJECT-TYPE
SYNTAX      Counter32
UNITS       "frames"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The number of times a frame was dropped on this port
because it contained unsupported options.

Discontinuities in the value of this counter can occur
at re-initialization of the management system, and at
other times as indicated by the value of the
ifCounterDiscontinuityTime object of the associated
interface."
REFERENCE
"RFC 6325, Section 3.5"
::= { rbridgePortCounterEntry 3 }

rbridgePortTrillInFrames OBJECT-TYPE
SYNTAX      Counter64
UNITS       "frames"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The number of TRILL-encapsulated frames that have been
received by this port from its attached link, including
management frames.

Discontinuities in the value of this counter can occur
at re-initialization of the management system, and at
other times as indicated by the value of the
ifCounterDiscontinuityTime object of the associated
interface."

REFERENCE
"RFC 6325, Section 2.3"
::= { rbridgePortCounterEntry 4 }

rbridgePortTrillOutFrames OBJECT-TYPE
SYNTAX Counter64
UNITS "frames"
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of TRILL-encapsulated frames that have been
transmitted by this port to its attached link, including
management frames.

Discontinuities in the value of this counter can occur
at re-initialization of the management system, and at
other times as indicated by the value of the
ifCounterDiscontinuityTime object of the associated
interface."

REFERENCE
"RFC 6325, Section 2.3"
::= { rbridgePortCounterEntry 5 }

-- ---------------------------------------------------------- --
-- The RBridge VLAN ESADI Table
-- ---------------------------------------------------------- --

rbridgeEsadiTable OBJECT-TYPE
SYNTAX  SEQUENCE OF RbridgeEsadiEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A table that contains information about ESADI instances on
VLANs, if available."

REFERENCE
"RFC 6325, Section 4.2.5"
::= { rbridgeEsadi 1 }
rbridgeEsadiEntry OBJECT-TYPE
SYNTAX RbridgeEsadiEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "Information about an ESADI instance on a VLAN."
INDEX { rbridgeVlanIndex }
 ::= { rbridgeEsadiTable 1 }

RbridgeEsadiEntry ::= SEQUENCE {
   rbridgeEsadiEnable TruthValue,
   rbridgeEsadiConfidence Unsigned32,
   rbridgeEsadiDrbPriority Unsigned32,
   rbridgeEsadiDrb RbridgeAddress,
   rbridgeEsadiDrbHoldingTime Unsigned32,
   rbridgeEsadiRowStatus RowStatus
}

rbridgeEsadiEnable OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-create
STATUS current
DESCRIPTION "If the RBridge is participating in an ESADI instance for
this VLAN, the value of this object is ‘true’. To disable
participation, set it to ‘false’.

The value of this object MUST be retained across
re-initializations of the management system."
REFERENCE "RFC 6325, Section 4.2.5"
DEFVAL { true }
 ::= { rbridgeEsadiEntry 1 }

rbridgeEsadiConfidence OBJECT-TYPE
SYNTAX Unsigned32 (0..255)
MAX-ACCESS read-create
STATUS current
DESCRIPTION "Confidence level of address entries sent by this
ESADI instance. The default is 16."
The value of this object MUST be retained across re-initializations of the management system.

REFERENCE
"RFC 6325, Section 4.2.5"

DEFVAL { 16 }
::= { rbridgeEsadiEntry 2 }

rbridgeEsadiDrbPriority OBJECT-TYPE
SYNTAX Unsigned32 (0..127)
MAX-ACCESS read-create
STATUS current
DESCRIPTION "The priority of this RBridge for being selected as the DRB for this ESADI instance.

The value of this object MUST be retained across re-initializations of the management system."

REFERENCE
"RFC 6325, Section 4.2.5"
::= { rbridgeEsadiEntry 3 }

rbridgeEsadiDrb OBJECT-TYPE
SYNTAX RbridgeAddress
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The DRB on this ESADI instance’s virtual link."

REFERENCE
"RFC 6325, Section 4.2.5"
::= { rbridgeEsadiEntry 4 }

rbridgeEsadiDrbHoldingTime OBJECT-TYPE
SYNTAX Unsigned32 (0..127)
MAX-ACCESS read-create
STATUS current
DESCRIPTION "The holding time for this ESADI instance.

The value of this object MUST be retained across re-initializations of the management system."

REFERENCE
"RFC 6325, Section 4.2.5"
::= { rbridgeEsadiEntry 5 }

rbridgeEsadiRowStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION
   "This object indicates the status of the entry."
::= { rbridgeEsadiEntry 6 }

-- ---------------------------------------------------------- --
-- The RBridge IP Multicast Snooping Port Table
-- ---------------------------------------------------------- --

rbridgeSnoopingPortTable OBJECT-TYPE
SYNTAX      SEQUENCE OF RbridgeSnoopingPortEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
   "For RBridges implementing IP Multicast Snooping,
information about ports on which the presence of IPv4
or IPv6 multicast routers has been detected."
REFERENCE
   "RFC 6325, Section 4.7"
::= { rbridgeSnooping 1 }

rbridgeSnoopingPortEntry OBJECT-TYPE
SYNTAX      RbridgeSnoopingPortEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
   "Information about ports on which the presence of IPv4
or IPv6 multicast routers has been detected for a
VLAN."
INDEX   { rbridgeBasePort, rbridgeVlanIndex }
::= { rbridgeSnoopingPortTable 1 }

RbridgeSnoopingPortEntry ::=
   SEQUENCE {
      rbridgeSnoopingPortAddrType
         INTEGER
   }

rbridgeSnoopingPortAddrType OBJECT-TYPE
SYNTAX      INTEGER {
                   ipv4(1),
                   ipv6(2),
                   ipv4v6(3)
               }
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "The IP address type of an IP multicast router detected
on this port and VLAN. If only IPv4 router(s) are detected, the value returned is ‘ipv4’. If only IPv6 routers are detected, the value returned is ‘ipv6’. If both IPv4 and IPv6 routers are detected on this port and VLAN, the value returned is ‘ipv4v6’.

REFERENCE
"RFC 6325, Section 4.7"
::= { rbridgeSnoopingPortEntry 1 }

-- ---------------------------------------------------------- --
-- The RBridge IP Multicast Snooping Address Table
-- ---------------------------------------------------------- --

rbridgeSnoopingAddrTable OBJECT-TYPE
SYNTAX SEQUENCE OF RbridgeSnoopingAddrEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "For RBridges implementing IP Multicast Snooping, information about IP multicast addresses being snooped."
REFERENCE "RFC 6325, Section 4.8"
::= { rbridgeSnoopingAddrTable 1 }

RbridgeSnoopingAddrEntry OBJECT-TYPE
SYNTAX RbridgeSnoopingAddrEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "Information about IP multicast addresses being snooped."
INDEX { rbridgeVlanIndex, rbridgeSnoopingAddrType, rbridgeSnoopingAddr }
::= { rbridgeSnoopingAddrTable 1 }

RbridgeSnoopingAddrEntry ::= SEQUENCE {
  rbridgeSnoopingAddrType
  InetAddressType,
  rbridgeSnoopingAddr
  InetAddress,
  rbridgeSnoopingAddrPorts
  PortList
}

RbridgeSnoopingAddrType OBJECT-TYPE
SYNTAX InetAddressType
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The IP multicast address type for which a listener has been
detected by this RBridge. This MIB requires support for only
IPv4 and IPv6 address types."
REFERENCE "RFC 6325, Section 4.7"
 ::= { rbridgeSnoopingAddrEntry 1 }

rbridgeSnoopingAddr OBJECT-TYPE
SYNTAX InetAddress
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The IP multicast address for which a listener has been
detected by this RBridge. The address type of this object
is specified in rbridgeSnoopingAddrType. This MIB requires
support for only global IPv4 and IPv6 addresses, so the
length of the object can be either 4 or 16 bytes. Hence,
the index will not exceed the OID size limit."
REFERENCE "RFC 6325, Section 4.7"
 ::= { rbridgeSnoopingAddrEntry 2 }

rbridgeSnoopingAddrPorts OBJECT-TYPE
SYNTAX PortList
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The set of ports on which a listener has been detected
for this IP multicast address."
REFERENCE "RFC 6325, Section 4.7"
 ::= { rbridgeSnoopingAddrEntry 3 }

-- ---------------------------------------------------------- --
-- Distribution Trees
-- ---------------------------------------------------------- --

rbridgeDtreePriority OBJECT-TYPE
SYNTAX Unsigned32 (1..65535)
MAX-ACCESS read-write
STATUS current
DESCRIPTION "The distribution tree root priority for this RBridge."
The default value of this object is 32768.

The value of this object MUST be retained across re-initializations of the management system.

REFERENCE
"RFC 6325, Section 4.5"

::= { rbridgeDtree 1 }

rbridgeDtreeActiveTrees OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
"The total number of trees being computed by all RBridges in the campus."
REFERENCE
"RFC 6325, Section 4.5"
::= { rbridgeDtree 2 }

rbridgeDtreeMaxTrees OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
"The maximum number of trees this RBridge can compute."
REFERENCE
"RFC 6325, Section 4.5"
::= { rbridgeDtree 3 }

rbridgeDtreeDesiredUseTrees OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS      current
DESCRIPTION
"The maximum number of trees this RBridge would like to use for transmission of ingress multi-destination frames."
REFERENCE
"RFC 6325, Section 4.5"
::= { rbridgeDtree 4 }

rbridgeDtreeTable OBJECT-TYPE
SYNTAX     SEQUENCE OF RbridgeDtreeEntry
MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
"Information about distribution trees being computed by this RBridge."
rbridgeDtreeEntry OBJECT-TYPE
SYNTAX    RbridgeDtreeEntry
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION    "List of information about distribution trees being computed
by this RBridge."
INDEX    { rbridgeDtreeNumber }
 ::= { rbridgeDtreeTable 1 }

RbridgeDtreeEntry ::= 
  SEQUENCE {
    rbridgeDtreeNumber
      Unsigned32,
    rbridgeDtreeNickname
      RbridgeNickname,
    rbridgeDtreeIngress
      TruthValue
  }

rbridgeDtreeNumber OBJECT-TYPE
SYNTAX    Unsigned32 (0..65535)
MAX-ACCESS not-accessible
STATUS    current
DESCRIPTION    "The tree number of a distribution tree being computed by
this RBridge."
REFERENCE    "RFC 6325, Section 4.5"
 ::= { rbridgeDtreeEntry 1 }

rbridgeDtreeNickname OBJECT-TYPE
SYNTAX    RbridgeNickname
MAX-ACCESS read-only
STATUS    current
DESCRIPTION    "The nickname of the distribution tree."
REFERENCE    "RFC 6325, Section 4.5"
 ::= { rbridgeDtreeEntry 2 }

rbridgeDtreeIngress OBJECT-TYPE
SYNTAX    TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION "Indicates whether this RBridge might choose this
distribution tree to ingress a multi-destination frame."
REFERENCE "RFC 6325, Section 4.5"
::= { rbridgeDtreeEntry 3 }

-- ---------------------------------------------------------- --
-- TRILL Neighbor List
-- ---------------------------------------------------------- --

rbridgeTrillMinMtuDesired OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION "The desired minimum acceptable inter-RBridge link MTU for
the campus, that is, originatingLSPBufferSize.
The value of this object MUST be retained across
re-initializations of the management system."
REFERENCE "RFC 6325, Section 4.3"
::= { rbridgeTrill 1 }

rbridgeTrillSz OBJECT-TYPE
SYNTAX      Unsigned32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION "The minimum acceptable inter-RBridge link size for the
campus for the proper operation of TRILL IS-IS."
REFERENCE "RFC 6325, Section 4.3"
::= { rbridgeTrill 2 }

rbridgeTrillMaxMtuProbes OBJECT-TYPE
SYNTAX      Unsigned32 (1..255)
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION "The number of failed MTU-probes before the RBridge
concludes that a particular MTU is not supported by
a neighbor."
The value of this object MUST be retained across re-initializations of the management system.

REFERENCE
"RFC 6325, Section 4.3"
::= { rbridgeTrill 3 }

rbridgeTrillNbrTable OBJECT-TYPE
SYNTAX     SEQUENCE OF RbridgeTrillNbrEntry
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION "Information about this RBridge’s TRILL neighbors."
REFERENCE
"RFC 6325, Section 4.4.2.1"
::= { rbridgeTrillNbrTable 1 }

RbridgeTrillNbrEntry ::= SEQUENCE {
  rbridgeTrillNbrMacAddr  MacAddress,
  rbridgeTrillNbrMtu     Unsigned32,
  rbridgeTrillNbrFailedMtuTest TruthValue
}

rbridgeTrillNbrMacAddr OBJECT-TYPE
SYNTAX     MacAddress
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION "The MAC address of a neighbor of this RBridge."
REFERENCE
"RFC 6325, Section 4.4.2.1"
::= { rbridgeTrillNbrEntry 1 }

rbridgeTrillNbrMtu OBJECT-TYPE
SYNTAX     Unsigned32
MAX-ACCESS read-only
STATUS  current
DESCRIPTION
"MTU size for this neighbor for IS-IS communication
purposes."
REFERENCE
"RFC 6325, Section 4.3.2"
::= { rbridgeTrillNbrEntry 2 }

rbridgeTrillNbrFailedMtutTest OBJECT-TYPE
SYNTAX        TruthValue
MAX-ACCESS    read-only
STATUS        current
DESCRIPTION
"If true, indicates that the neighbor’s tested MTU is less
than the minimum acceptable inter-bridge link MTU for the
campus (1470)."
REFERENCE
"RFC 6325, Section 4.3.1"
::= { rbridgeTrillNbrEntry 3 }

-- ---------------------------------------------------------- --
-- Notifications for use by RBridges
-- ---------------------------------------------------------- --

rbridgeBaseNewDrb NOTIFICATION-TYPE
-- OBJECTS     { }
STATUS        current
DESCRIPTION
"The rbridgeBaseNewDrb notification indicates that the
sending agent has become the new Designated RBridge; the
notification is sent by an RBridge soon after its election
as the new DRB root, e.g., upon expiration of the Topology
Change Timer, immediately subsequent to its election."
::= { rbridgeNotifications 1 }

rbridgeBaseTopologyChange NOTIFICATION-TYPE
-- OBJECTS     { }
STATUS        current
DESCRIPTION
"The rbridgeBaseTopologyChange notification is sent by an
RBridge when any of its configured ports transition to/from
the VLAN-x designated forwarder. The notification is not
sent if an rbridgeBaseNewDrb notification is sent for the
same transition."
::= { rbridgeNotifications 2 }

Rijhsinghani & Zebrose       Standards Track                   [Page 45]
-- Compliance and Group sections

rbridgeCompliances OBJECT IDENTIFIER ::= { rbridgeConformance 1 }
rbridgeGroup OBJECT IDENTIFIER ::= { rbridgeConformance 2 }

-- ------------------------------------------------------------------
-- Units of Conformance
-- ------------------------------------------------------------------

rbridgeBaseGroup OBJECT-GROUP
OBJECTS {
  rbridgeBaseTrillVersion,
  rbridgeBaseNumPorts,
  rbridgeBaseForwardDelay,
  rbridgeBaseUniMultipathEnable,
  rbridgeBaseMultiMultipathEnable,
  rbridgeBaseAcceptEncapNonadj,
  rbridgeBaseNicknameNumber
}
STATUS current
DESCRIPTION
  "A collection of objects providing basic control and status information
   for the RBridge."
::= { rbridgeGroup 1 }

rbridgeBaseNicknameGroup OBJECT-GROUP
OBJECTS {
  rbridgeBaseNicknamePriority,
  rbridgeBaseNicknameDtrPriority,
  rbridgeBaseNicknameType,
  rbridgeBaseNicknameRowStatus
}
STATUS current
DESCRIPTION
  "A collection of objects providing basic control and status information
   for RBridge nicknames."
::= { rbridgeGroup 2 }

rbridgeBasePortGroup OBJECT-GROUP
OBJECTS {
  rbridgeBasePortIfIndex,
  rbridgeBasePortDisable,
  rbridgeBasePortTrunkPort,
  rbridgeBasePortAccessPort,
  rbridgeBasePortP2pHellos,
  rbridgeBasePortState,
rbridgeBasePortDesiredDesigVlan,
rbridgeBasePortDesigVlan,
rbridgeBasePortInhibitionTime,
rbridgeBasePortDisableLearning,
rbridgeBasePortStpRoot,
rbridgeBasePortStpRootChanges,
rbridgeBasePortStpWiringCloset
}
STATUS current
DESCRIPTION
"A collection of objects providing basic control
and status information for RBridge ports."
::= { rbridgeGroup 3 }

rbridgeFdbGroup OBJECT-GROUP
OBJECTS {
rbridgeConfidenceNative,
rbridgeConfidenceDecap,
rbridgeConfidenceStatic,
rbridgeUniFdbPort,
rbridgeUniFdbNickname,
rbridgeUniFdbConfidence,
rbridgeUniFdbStatus
}
STATUS current
DESCRIPTION
"A collection of objects providing information
about the Unicast Address Database."
::= { rbridgeGroup 4 }

rbridgeFibGroup OBJECT-GROUP
OBJECTS {
rbridgeUniFibHopCount,
rbridgeMultiFibPorts
}
STATUS current
DESCRIPTION
"A collection of objects providing information
about the Unicast and Multicast FIBs."
::= { rbridgeGroup 5 }

rbridgeVlanGroup OBJECT-GROUP
OBJECTS {
rbridgeVlanForwarderLosts,
rbridgeVlanDisableLearning,
rbridgeVlanSnooping,
rbridgeVlanPortInhibited,
rbridgeVlanPortForwarder,
rbridgeVlanPortAnnouncing,
rbridgeVlanPortDetectedVlanMapping

}  
STATUS current  
DESCRIPTION  
"A collection of objects providing information about VLANs on the RBridge."
 ::= { rbridgeGroup 6 }

rbridgePortCounterGroup OBJECT-GROUP
OBJECTS {
  rbridgePortRpfCheckFails,
  rbridgePortHopCountExceeds,
  rbridgePortOptionDrops,
  rbridgePortTrillInFrames,
  rbridgePortTrillOutFrames
}
STATUS current  
DESCRIPTION  
"A collection of objects providing per-port counters for the RBridge."
 ::= { rbridgeGroup 7 }

rbridgeEsadiGroup OBJECT-GROUP
OBJECTS {
  rbridgeEsadiEnable,
  rbridgeEsadiConfidence,
  rbridgeEsadiDrbPriority,
  rbridgeEsadiDrb,
  rbridgeEsadiDrbHoldingTime,
  rbridgeEsadiRowStatus
}
STATUS current  
DESCRIPTION  
"A collection of objects providing information about ESADI instances on the RBridge."
 ::= { rbridgeGroup 8 }

rbridgeSnoopingGroup OBJECT-GROUP
OBJECTS {
  rbridgeSnoopingPortAddrType,
  rbridgeSnoopingAddrPorts
}
STATUS current  
DESCRIPTION  
"A collection of objects providing information about IP Multicast Snooping. This MIB requires support for only global IPv4 and IPv6 address types in
rbridgeSnoopingPortAddrType and rbridgeSnoopingAddrType, so the length of rbridgeSnoopingAddr can be either 4 or 16 bytes.

::= { rbridgeGroup 9 }

rbridgeDtreeGroup OBJECT-GROUP
  OBJECTS {
    rbridgeDtreePriority,
    rbridgeDtreeActiveTrees,
    rbridgeDtreeMaxTrees,
    rbridgeDtreeDesiredUseTrees,
    rbridgeDtreeNickname,
    rbridgeDtreeIngress
  }
  STATUS current
  DESCRIPTION "A collection of objects providing information about distribution trees."

::= { rbridgeGroup 10 }

rbridgeTrillGroup OBJECT-GROUP
  OBJECTS {
    rbridgeTrillMinMtuDesired,
    rbridgeTrillSz,
    rbridgeTrillMaxMtuProbes,
    rbridgeTrillNbrMtu,
    rbridgeTrillNbrFailedMtuTest
  }
  STATUS current
  DESCRIPTION "A collection of objects providing information about TRILL neighbors."

::= { rbridgeGroup 11 }

rbridgeNotificationGroup NOTIFICATION-GROUP
  NOTIFICATIONS {
    rbridgeBaseNewDrb,
    rbridgeBaseTopologyChange
  }
  STATUS current
  DESCRIPTION "A collection of objects describing notifications (traps)."

::= { rbridgeGroup 12 }
rbridgeCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION "The compliance statement for support of RBridge services."

MODULE
MANDATORY-GROUPS {
rbridgeBaseGroup,
rbridgeBaseNicknameGroup,
rbridgeBasePortGroup,
rbridgeFdbGroup,
rbridgeFibGroup,
rbridgeVlanGroup,
rbridgeDtreeGroup,
rbridgeTrillGroup,
rbridgeNotificationGroup
}

GROUP rbridgePortCounterGroup
DESCRIPTION "Implementation of this group is optional."

GROUP rbridgeEsadiGroup
DESCRIPTION "Implementation of this group is optional."

GROUP rbridgeSnoopingGroup
DESCRIPTION "Implementation of this group is optional."

::= { rbridgeCompliances 1 }

rbridgeReadOnlyCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION "When this MIB is implemented in read-only mode, then the implementation can claim read-only compliance. In that case, RBridge objects can be monitored but cannot be configured with this implementation."
MODULE
MANDATORY-GROUPS { rbridgeBaseGroup, rbridgeBaseNicknameGroup, rbridgeBasePortGroup, rbridgeFdbGroup, rbridgeFibGroup, rbridgeVlanGroup, rbridgeDtreeGroup, rbridgeTrillGroup, rbridgeNotificationGroup }

OBJECT  rbridgeBaseForwardDelay
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

OBJECT  rbridgeBaseUniMultipathEnable
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

OBJECT  rbridgeBaseMultiMultipathEnable
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

OBJECT  rbridgeBaseAcceptEncapNonadj
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

OBJECT  rbridgeBaseNicknameNumber
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

OBJECT  rbridgeBaseNicknamePriority
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."

OBJECT  rbridgeBaseNicknameDtrPriority
MIN-ACCESS  read-only
DESCRIPTION  "Write access is not required."
OBJECT  rbridgeBaseNicknameRowStatus
SYNTAX  INTEGER { active(1) }
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required, and 'active' is the only status that needs to be supported."

OBJECT  rbridgeBasePortDisable
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT  rbridgeBasePortTrunkPort
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT  rbridgeBasePortAccessPort
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT  rbridgeBasePortP2pHellos
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT  rbridgeBasePortInhibitionTime
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT  rbridgeBasePortDisableLearning
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT  rbridgeBasePortDesiredDesigVlan
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT  rbridgeBasePortStpWiringCloset
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."
OBJECT  rbridgeConfidenceNative
MIN-ACCESS  read-only
DESCRIPTION
 "Write access is not required."

OBJECT  rbridgeConfidenceDecap
MIN-ACCESS  read-only
DESCRIPTION
 "Write access is not required."

OBJECT  rbridgeConfidenceStatic
MIN-ACCESS  read-only
DESCRIPTION
 "Write access is not required."

OBJECT  rbridgeVlanDisableLearning
MIN-ACCESS  read-only
DESCRIPTION
 "Write access is not required."

OBJECT  rbridgeVlanPortAnnouncing
MIN-ACCESS  read-only
DESCRIPTION
 "Write access is not required."

OBJECT  rbridgeEsadiEnable
MIN-ACCESS  read-only
DESCRIPTION
 "Write access is not required."

OBJECT  rbridgeEsadiConfidence
MIN-ACCESS  read-only
DESCRIPTION
 "Write access is not required."

OBJECT  rbridgeEsadiDrbPriority
MIN-ACCESS  read-only
DESCRIPTION
 "Write access is not required."

OBJECT  rbridgeEsadiDrbHoldingTime
MIN-ACCESS  read-only
DESCRIPTION
 "Write access is not required."

OBJECT  rbridgeEsadiRowStatus
SYNTAX  INTEGER { active(1) }
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required, and 'active' is the only status that needs to be supported."

OBJECT  rbridgeDtreePriority
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT  rbridgeTrillMinMtuDesired
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

OBJECT  rbridgeTrillMaxMtuProbes
MIN-ACCESS  read-only
DESCRIPTION
  "Write access is not required."

GROUP   rbridgePortCounterGroup
DESCRIPTION
  "Implementation of this group is optional."

GROUP   rbridgeEsadiGroup
DESCRIPTION
  "Implementation of this group is optional."

GROUP   rbridgeSnoopingGroup
DESCRIPTION
  "Implementation of this group is optional."

::= { rbridgeCompliances 2 }

END
8. Security Considerations

This MIB relates to a system that will provide network connectivity and packet-forwarding services. As such, improper manipulation of the objects represented by this MIB may result in denial of service to a large number of end-users.

There are a number of management objects defined in this MIB module with a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations. These are the tables and objects and their sensitivity/vulnerability:

The following tables and objects in the RBRIDGE-MIB can be manipulated to interfere with the operation of RBridges:

- rbridgeBaseUniMultipathEnable affects the ability of the RBridge to route unicast traffic over multiple paths, and
- rbridgeBaseMultiMultipathEnable affects the ability of the RBridge to route multi-destination traffic over multiple paths.

- rbridgeBasePortTable contains a number of objects that may affect network connectivity. Actions that may be triggered by manipulating objects in this table include disabling of an RBridge port, discarding of native packets, disabling learning, and others.

- rbridgeEsadiTable contains objects that affect the operation of the ESADI protocol used for learning, and manipulation of the objects contained therein can be used to confuse the learning ability of RBridges.

- rbridgeDtreePriority can affect computation of distribution trees within an RBridge campus, thereby affecting the forwarding of multi-destination traffic.

- rbridgeTrillMinMtuDesired can affect the size of packets being used to exchange information between RBridges.

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over
the network via SNMP. For example, access to network topology and
RBridge attributes can reveal information that should not be
available to all users of the network.

SNMP versions prior to SNMPv3 did not include adequate security.
Even if the network itself is secure (for example by using IPsec),
there is no control as to who on the secure network is allowed to
access and GET/SET (read/change/create/delete) the objects in this
MIB module.

Implementations SHOULD provide the security features described by the
SNMPv3 framework (see [RFC3410]), and implementations claiming
compliance to the SNMPv3 standard MUST include full support for
authentication and privacy via the User-based Security Model (USM)
[RFC3414] with the AES cipher algorithm [RFC3826]. Implementations
MAY also provide support for the Transport Security Model (TSM)
[RFC5591] in combination with a secure transport such as SSH
[RFC5592] or TLS/DTLS [RFC6353].

Further, deployment of SNMP versions prior to SNMPv3 is NOT
RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to
enable cryptographic security. It is then a customer/operator
responsibility to ensure that the SNMP entity giving access to an
instance of this MIB module is properly configured to give access to
the objects only to those principals (users) that have legitimate
rights to indeed GET or SET (change/create/delete) them.

For other RBridge security considerations, see [RFC6325].

9. IANA Considerations

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

    Descriptor          OBJECT IDENTIFIER value
    --------            -----------------------
    rbridgeMIB          { mib-2 214 }

10. Contributors

The authors would like to acknowledge the contributions of Donald
Eastlake, Radia Perlman, Anoop Ghanwani, Dan Romascanu, Mahesh Akula,
Sue Hares, and Joan Cucchiara.
11. References

11.1. Normative References


11.2. Informative References


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