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Definitions of Managed Objects for Mapping SYSLOG Messages to Simple Network Management Protocol (SNMP) Notifications

Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it defines a mapping of SYSLOG messages to Simple Network Management Protocol (SNMP) notifications.

Status of This Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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1. Introduction

SNMP ([RFC3410], [RFC3411]) and SYSLOG [RFC5424] are two widely used protocols to communicate event notifications. Although co-existence of several management protocols in one operational environment is possible, certain environments require that all event notifications be collected by a single system daemon, such as a SYSLOG collector or an SNMP notification receiver, via a single management protocol. In such environments, it is necessary to translate event notifications between management protocols.

This document defines an SNMP MIB module to represent SYSLOG messages and to send SYSLOG messages as SNMP notifications to SNMP notification receivers.

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. Conventions

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 [RFC2119].

4. Overview

SYSLOG messages are translated to SNMP by a SYSLOG-to-SNMP translator. Such a translator acts as a SYSLOG collector [RFC5424] and implements a MIB module according to the SNMP architecture [RFC3411]. The translator might be tightly coupled to an SNMP agent or it might interface with an SNMP agent via a subagent protocol.

After initialization, the SYSLOG-to-SNMP translator will listen for SYSLOG messages. On receiving a message, the message will be parsed to extract information as described in the MIB module. A conceptual table is populated with information extracted from the SYSLOG message, and finally a notification may be generated.

The MIB module is organized into a group of scalars and two tables. The syslogMsgControl group contains two scalars controlling the maximum size of SYSLOG messages recorded in the tables and also controlling whether SNMP notifications are generated for SYSLOG messages.

```
--syslogMsgObjects(1)
  |
  +--syslogMsgControl(1)
     |
     +-- Unsigned32 syslogMsgTableMaxSize(1)
     +-- TruthValue syslogMsgEnableNotifications(2)
```

The syslogMsgTable contains one entry for each recorded SYSLOG message. The basic fields of SYSLOG messages as well as message properties are represented in different columns of the conceptual table.

```
--syslogMsgObjects(1)
  |
  +--syslogMsgTable(2)
     |
     +--syslogMsgEntry(1) [syslogMsgIndex]
        |
        +-- Unsigned32      syslogMsgIndex(1)
        +-- SyslogFacility  syslogMsgFacility(2)
        +-- SyslogSeverity  syslogMsgSeverity(3)
        +-- Unsigned32      syslogMsgVersion(4)
```

```
          +-- SyslogTimeStamp syslogMsgTimeStamp(5)
          +-- DisplayString   syslogMsgHostName(6)
          +-- DisplayString   syslogMsgAppName(7)
          +-- DisplayString   syslogMsgProcID(8)
          +-- DisplayString   syslogMsgMsgID(9)
          +-- Unsigned32      syslogMsgSDParams(10)
          +-- OctetString     syslogMsgMsg(11)
```

The syslogMsgSDTable contains one entry for each structured data element parameter contained in a SYSLOG message. Since structured data elements are optional, the relationship between the syslogMsgTable and the syslogMsgSDTable ranges from one-to-zero to one-to-many.

```
--syslogMsgObjects(1)
  |
  +--syslogMsgSDTable(3)
     |
     +--syslogMsgSDEntry(1)       [syslogMsgIndex,
        |                          syslogMsgSDParamIndex,
        |                          syslogMsgSDID,
        |                          syslogMsgSDParamName]
        |
        +-- Unsigned32             syslogMsgSDParamIndex(1)
        +-- DisplayString          syslogMsgSDID(2)
        +-- DisplayString          syslogMsgSDParamName(3)
        +-- SyslogParamValueString syslogMsgSDParamValue(4)
```

5. Relationship to Other MIB Modules

The NOTIFICATION-LOG-MIB [RFC3014] provides a generic mechanism for logging SNMP notifications in order to deal with lost SNMP notifications, e.g., due to transient communication problems. Applications can poll the notification log to verify that they have not missed important SNMP notifications.

The MIB module defined in this memo provides a mechanism for logging SYSLOG notifications. This additional SYSLOG notification log is provided because (a) SYSLOG messages might not lead to SNMP notification (this is configurable) and (b) SNMP notifications might not carry all information associated with a SYSLOG notification.

The MIB module IMPORTS objects from SNMPv2-SMI [RFC2578], SNMPv2-TC [RFC2579], SNMPv2-CONF [RFC2580], SNMP-FRAMEWORK-MIB [RFC3411], and SYSLOG-TC-MIB [RFC5427].

The textual convention SyslogParamValueString uses the UTF-8 transformation format of the ISO/IEC IS 10646-1 character set defined in [RFC3629].

6. Relationship to the SNMP Notification to SYSLOG Mapping

A companion document [RFC5675] defines a mapping of SNMP notifications to SYSLOG messages. This section discusses the possibilities of using both specifications in combination.

A SYSLOG collector implementing the SYSLOG-MSG-MIB module and the mapping of SNMP notifications to SYSLOG messages may be configured to translate received SYSLOG messages containing SNMP notifications back into the original SNMP notification. In this case, the relevant tables of the SYSLOG-MSG-MIB will not be populated for SYSLOG messages carrying SNMP notifications. This configuration allows operators to build a forwarding chain where SNMP notifications are "tunneled" through SYSLOG messages. Due to size restrictions of the SYSLOG transports and the more verbose textual encoding used by SYSLOG, there is a possibility that SNMP notification content will get truncated when tunneled through SYSLOG, and thus the resulting SNMP notification may be incomplete.

An SNMP management application supporting the SYSLOG-MSG-MIB and the mapping of SNMP notifications to SYSLOG messages may process information from the SYSLOG-MSG-MIB in order to emit a SYSLOG message representing the SYSLOG message recorded in the SYSLOG-MSG-MIB module. This configuration allows operators to build a forwarding chain where SYSLOG messages are "tunneled" through SNMP messages. A notification receiver can determine whether a syslogMsgNotification contained all structured data element parameters of a SYSLOG message. In case parameters are missing, a forwarding application MUST retrieve the missing parameters from the SYSLOG-MSG-MIB. Regular polling of the SYSLOG-MSG-MIB can be used to take care of any lost SNMP notifications.

7. Definitions

```
 SYSLOG-MSG-MIB DEFINITIONS ::= BEGIN

 IMPORTS
     MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE, Unsigned32, mib-2
         FROM SNMPv2-SMI
     TEXTUAL-CONVENTION, DisplayString, TruthValue
         FROM SNMPv2-TC
     OBJECT-GROUP, NOTIFICATION-GROUP, MODULE-COMPLIANCE
         FROM SNMPv2-CONF
     SyslogFacility, SyslogSeverity
```

```
        FROM SYSLOG-TC-MIB;

 syslogMsgMib MODULE-IDENTITY
     LAST-UPDATED "200908130800Z"
     ORGANIZATION "IETF OPSAWG Working Group"
     CONTACT-INFO
         "Juergen Schoenwaelder
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          Sarjapur Marathahalli ORR,
          Bangalore, Karnataka 560103
          India"

     DESCRIPTION
         "This MIB module represents SYSLOG messages as SNMP objects.

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          (http://trustee.ietf.org/license-info).

          This version of this MIB module is part of RFC 5676; see
          the RFC itself for full legal notices."

     REVISION "200908130800Z"
     DESCRIPTION
         "Initial version issued as part of RFC 5676."
     ::= { mib-2 192 }
```

```
 -- textual convention definitions

 SyslogTimeStamp ::= TEXTUAL-CONVENTION
     DISPLAY-HINT "2d-1d-1d,1d:1d:1d.3d,1a1d:1d"
     STATUS       current
     DESCRIPTION
        "A date-time specification.  This type is similar to the
         DateAndTime type defined in the SNMPv2-TC, except the
         subsecond granulation is microseconds instead of
         deciseconds and a zero-length string can be used
         to indicate a missing value.

         field  octets  contents                  range
         -----  ------  --------                  -----
           1      1-2   year*                     0..65536
           2       3    month                     1..12
           3       4    day                       1..31
           4       5    hour                      0..23
           5       6    minutes                   0..59
           6       7    seconds                   0..60
                        (use 60 for leap-second)
           7     8-10   microseconds*             0..999999
           8      11    direction from UTC        '+' / '-'
           9      12    hours from UTC*           0..13
          10      13    minutes from UTC          0..59

         * Notes:
         - the value of year is in network-byte order
         - the value of microseconds is in network-byte order
         - daylight saving time in New Zealand is +13

         For example, Tuesday May 26, 1992 at 1:30:15 PM EDT would be
         displayed as:

                         1992-5-26,13:30:15.0,-4:0

         Note that if only local time is known, then timezone
         information (fields 11-13) is not present."
     SYNTAX      OCTET STRING (SIZE (0 | 10 | 13))

 SyslogParamValueString ::= TEXTUAL-CONVENTION
     DISPLAY-HINT "65535t"
     STATUS       current
     DESCRIPTION
        "The value of a SYSLOG SD-PARAM is represented using the
         ISO/IEC IS 10646-1 character set, encoded as an octet string
         using the UTF-8 transformation format described in RFC 3629.
```

```
            Since additional code points are added by amendments to the
            10646 standard from time to time, implementations must be
            prepared to encounter any code point from 0x00000000 to
            0x7fffffff.  Byte sequences that do not correspond to the
            valid UTF-8 encoding of a code point or that are outside this
            range are prohibited.  Similarly, overlong UTF-8 sequences
            are prohibited.

            UTF-8 may require multiple bytes to represent a single
            character / code point; thus, the length of this object in
            octets may be different from the number of characters
            encoded.  Similarly, size constraints refer to the number of
            encoded octets, not the number of characters represented by
            an encoding."
        REFERENCE
           "RFC 3629: UTF-8, a transformation format of ISO 10646"
        SYNTAX     OCTET STRING

    -- object definitions

    syslogMsgNotifications OBJECT IDENTIFIER ::= { syslogMsgMib 0 }
    syslogMsgObjects       OBJECT IDENTIFIER ::= { syslogMsgMib 1 }
    syslogMsgConformance   OBJECT IDENTIFIER ::= { syslogMsgMib 2 }

    syslogMsgControl       OBJECT IDENTIFIER ::= { syslogMsgObjects 1 }

    syslogMsgTableMaxSize OBJECT-TYPE
        SYNTAX      Unsigned32
        MAX-ACCESS  read-write
        STATUS      current
        DESCRIPTION
           "The maximum number of SYSLOG messages that may be held in
            syslogMsgTable.  A particular setting does not guarantee that
            there is sufficient memory available for the maximum number
            of table entries indicated by this object.  A value of 0 means
            no fixed limit.

            If an application reduces the limit while there are SYSLOG
            messages in the syslogMsgTable, the SYSLOG messages that are
            in the syslogMsgTable for the longest time MUST be discarded
            to bring the table down to the new limit.

            The value of this object should be kept in nonvolatile
            memory."
        DEFVAL      { 0 }
        ::= { syslogMsgControl 1 }

    syslogMsgEnableNotifications OBJECT-TYPE
```

```
    SYNTAX      TruthValue
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
       "Indicates whether syslogMsgNotification notifications are
        generated.

        The value of this object should be kept in nonvolatile
        memory."
    DEFVAL      { false }
    ::= { syslogMsgControl 2 }

syslogMsgTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF SyslogMsgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
       "A table containing recent SYSLOG messages.  The size of the
        table is controlled by the syslogMsgTableMaxSize object."
    ::= { syslogMsgObjects 2 }

syslogMsgEntry OBJECT-TYPE
    SYNTAX      SyslogMsgEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
       "An entry of the syslogMsgTable."
    INDEX { syslogMsgIndex }
    ::= { syslogMsgTable 1 }

SyslogMsgEntry ::= SEQUENCE {
    syslogMsgIndex      Unsigned32,
    syslogMsgFacility   SyslogFacility,
    syslogMsgSeverity   SyslogSeverity,
    syslogMsgVersion    Unsigned32,
    syslogMsgTimeStamp  SyslogTimeStamp,
    syslogMsgHostName   DisplayString,
    syslogMsgAppName    DisplayString,
    syslogMsgProcID     DisplayString,
    syslogMsgMsgID      DisplayString,
    syslogMsgSDParams   Unsigned32,
    syslogMsgMsg        OCTET STRING
}

syslogMsgIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
```

```
     DESCRIPTION
        "A monotonically increasing number used to identify entries in
         the syslogMsgTable.  When syslogMsgIndex reaches the maximum
         value (4294967295), the value wraps back to 1.

         Applications periodically polling the syslogMsgTable for new
         entries should take into account that a complete rollover of
         syslogMsgIndex will happen if more than 4294967294 messages
         are received during a poll interval."
     ::= { syslogMsgEntry 1 }

 syslogMsgFacility OBJECT-TYPE
     SYNTAX      SyslogFacility
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
        "The facility of the SYSLOG message."
     REFERENCE
        "RFC 5424: The Syslog Protocol (Section 6.2.1)
         RFC 5427: Textual Conventions for Syslog Management"
     ::= { syslogMsgEntry 2 }

 syslogMsgSeverity OBJECT-TYPE
     SYNTAX      SyslogSeverity
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
        "The severity of the SYSLOG message"
     REFERENCE
        "RFC 5424: The Syslog Protocol (Section 6.2.1)
         RFC 5427: Textual Conventions for Syslog Management"
     ::= { syslogMsgEntry 3 }

 syslogMsgVersion OBJECT-TYPE
     SYNTAX      Unsigned32 (0..999)
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
        "The version of the SYSLOG message.  A value of 0 indicates
         that the version is unknown."
     REFERENCE
        "RFC 5424: The Syslog Protocol (Section 6.2.2)"
     ::= { syslogMsgEntry 4 }

 syslogMsgTimeStamp OBJECT-TYPE
     SYNTAX      SyslogTimeStamp
     MAX-ACCESS  read-only
     STATUS      current
```

```
     DESCRIPTION
        "The timestamp of the SYSLOG message.  A zero-length
         string is returned if the timestamp is unknown."
     REFERENCE
        "RFC 5424: The Syslog Protocol (Section 6.2.3)"
     ::= { syslogMsgEntry 5 }

 syslogMsgHostName OBJECT-TYPE
     SYNTAX      DisplayString (SIZE (0..255))
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
        "The hostname and the (optional) domain name of the SYSLOG
         message.  A zero-length string indicates an unknown hostname.
         The SYSLOG protocol specification constrains this string to
         printable US-ASCII code points."
     REFERENCE
        "RFC 5424: The Syslog Protocol (Section 6.2.4)"
     ::= { syslogMsgEntry 6 }

 syslogMsgAppName OBJECT-TYPE
     SYNTAX      DisplayString (SIZE (0..48))
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
        "The app-name of the SYSLOG message.  A zero-length string
         indicates an unknown app-name.  The SYSLOG protocol
         specification constrains this string to printable US-ASCII
         code points."
     REFERENCE
        "RFC 5424: The Syslog Protocol (Section 6.2.5)"
     ::= { syslogMsgEntry 7 }

 syslogMsgProcID OBJECT-TYPE
     SYNTAX      DisplayString (SIZE (0..128))
     MAX-ACCESS  read-only
     STATUS      current
     DESCRIPTION
        "The procid of the SYSLOG message.  A zero-length string
         indicates an unknown procid.  The SYSLOG protocol
         specification constrains this string to printable
         US-ASCII code points."
     REFERENCE
        "RFC 5424: The Syslog Protocol (Section 6.2.6)"
     ::= { syslogMsgEntry 8 }

 syslogMsgMsgID OBJECT-TYPE
     SYNTAX      DisplayString (SIZE (0..32))
```

```
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "The msgid of the SYSLOG message.  A zero-length string
        indicates an unknown msgid.  The SYSLOG protocol specification
        constrains this string to printable US-ASCII code points."
    REFERENCE
       "RFC 5424: The Syslog Protocol (Section 6.2.7)"
    ::= { syslogMsgEntry 9 }

syslogMsgSDParams OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "The total number of structured data element parameters
        carried in the SYSLOG message.  This number effectively
        indicates the number of entries in the syslogMsgSDTable.
        It can be used, for example, by a notification receiver
        to determine whether a notification carried all
        structured data element parameters of a SYSLOG message."
    ::= { syslogMsgEntry 10 }

syslogMsgMsg OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "The message part of the SYSLOG message.  The syntax does not
        impose a size restriction.  Implementations of this MIB module
        may truncate the message part of the SYSLOG message such that
        it fits into the size constraints imposed by the implementation
        environment.  Such truncations can also happen elsewhere in the
        SYSLOG forwarding chain.

        If the first octets contain the value 'EFBBBF'h, then the rest
        of the message is a UTF-8 string.  Since SYSLOG messages may be
        truncated at arbitrary octet boundaries during forwarding, the
        message may contain invalid UTF-8 encodings at the end."
    REFERENCE
       "RFC 5424: The Syslog Protocol (Sections 6.1 and 6.4)"
    ::= { syslogMsgEntry 11 }

syslogMsgSDTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF SyslogMsgSDEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
```

```
       "A table containing structured data elements of SYSLOG
        messages."
    ::= { syslogMsgObjects 3 }

syslogMsgSDEntry OBJECT-TYPE
    SYNTAX      SyslogMsgSDEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
       "An entry of the syslogMsgSDTable."
    INDEX { syslogMsgIndex, syslogMsgSDParamIndex,
            syslogMsgSDID, syslogMsgSDParamName }
    ::= { syslogMsgSDTable 1 }

SyslogMsgSDEntry ::= SEQUENCE {
    syslogMsgSDParamIndex  Unsigned32,
    syslogMsgSDID          DisplayString,
    syslogMsgSDParamName   DisplayString,
    syslogMsgSDParamValue  SyslogParamValueString
}

syslogMsgSDParamIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
       "This object indexes the structured data element parameters
        contained in a SYSLOG message.  The first structured data
        element parameter has the index value 1, and subsequent
        parameters are indexed by incrementing the index of the
        previous parameter.  The index increases across structured
        data element boundaries so that the value reflects the
        position of a structured data element parameter in a
        SYSLOG message."
    REFERENCE
       "RFC 5424: The Syslog Protocol (Section 6.3.3)"
    ::= { syslogMsgSDEntry 1 }

syslogMsgSDID OBJECT-TYPE
    SYNTAX      DisplayString (SIZE (1..32))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
       "The name (SD-ID) of a structured data element.  The SYSLOG
        protocol specification constrains this string to printable
        US-ASCII code points."
    REFERENCE
       "RFC 5424: The Syslog Protocol (Section 6.3.2)"
```

```
    ::= { syslogMsgSDEntry 2 }

 syslogMsgSDParamName OBJECT-TYPE
    SYNTAX      DisplayString (SIZE (1..32))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
       "The name of a parameter of the structured data element.  The
        SYSLOG protocol specification constrains this string to
        printable US-ASCII code points."
    REFERENCE
       "RFC 5424: The Syslog Protocol (Section 6.3.3)"
    ::= { syslogMsgSDEntry 3 }

 syslogMsgSDParamValue OBJECT-TYPE
    SYNTAX      SyslogParamValueString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
       "The value of the parameter of a SYSLOG message identified by
        the index of this table.  The value is stored in the unescaped
        format."
    REFERENCE
       "RFC 5424: The Syslog Protocol (Section 6.3.3)"
    ::= { syslogMsgSDEntry 4 }

 -- notification definitions

 syslogMsgNotification NOTIFICATION-TYPE
    OBJECTS     { syslogMsgFacility, syslogMsgSeverity,
                  syslogMsgVersion, syslogMsgTimeStamp,
                  syslogMsgHostName, syslogMsgAppName,
                  syslogMsgProcID, syslogMsgMsgID,
                  syslogMsgSDParams, syslogMsgMsg }
    STATUS      current
    DESCRIPTION
       "The syslogMsgNotification is generated when a new SYSLOG
        message is received and the value of
        syslogMsgGenerateNotifications is true.

        Implementations may add syslogMsgSDParamValue objects as long
        as the resulting notification fits into the size constraints
        imposed by the implementation environment and the notification
        message size constraints imposed by maxMessageSize [RFC3412]
        and SNMP transport mappings."
    ::= { syslogMsgNotifications 1 }

 -- conformance statements
```

```
 syslogMsgGroups      OBJECT IDENTIFIER ::= { syslogMsgConformance 1 }
 syslogMsgCompliances OBJECT IDENTIFIER ::= { syslogMsgConformance 2 }

 syslogMsgFullCompliance MODULE-COMPLIANCE
     STATUS      current
     DESCRIPTION
        "The compliance statement for implementations of the
         SYSLOG-MSG-MIB."
     MODULE      -- this module
     MANDATORY-GROUPS {
         syslogMsgGroup,
         syslogMsgSDGroup,
         syslogMsgControlGroup,
         syslogMsgNotificationGroup
     }
     ::= { syslogMsgCompliances 1 }

 syslogMsgReadOnlyCompliance MODULE-COMPLIANCE
     STATUS      current
     DESCRIPTION
        "The compliance statement for implementations of the
         SYSLOG-MSG-MIB that do not support read-write access."
     MODULE      -- this module
     MANDATORY-GROUPS {
         syslogMsgGroup,
         syslogMsgSDGroup,
         syslogMsgControlGroup,
         syslogMsgNotificationGroup
     }
     OBJECT syslogMsgTableMaxSize
        MIN-ACCESS  read-only
        DESCRIPTION
           "Write access is not required."
     OBJECT syslogMsgEnableNotifications
        MIN-ACCESS  read-only
        DESCRIPTION
           "Write access is not required."
     ::= { syslogMsgCompliances 2 }

 syslogMsgNotificationCompliance MODULE-COMPLIANCE
     STATUS      current
     DESCRIPTION
        "The compliance statement for implementations of the
         SYSLOG-MSG-MIB that do only generate notifications and do not
         provide a table to allow read access to SYSLOG message
         details."
     MODULE      -- this module
     MANDATORY-GROUPS {
```

```
        syslogMsgGroup,
        syslogMsgSDGroup,
        syslogMsgNotificationGroup
    }
    OBJECT      syslogMsgFacility
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
        "Read access is not required."
    OBJECT      syslogMsgSeverity
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
       "Read access is not required."
    OBJECT      syslogMsgVersion
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
       "Read access is not required."
    OBJECT      syslogMsgTimeStamp
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
       "Read access is not required."
    OBJECT      syslogMsgHostName
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
       "Read access is not required."
    OBJECT      syslogMsgAppName
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
       "Read access is not required."
    OBJECT      syslogMsgProcID
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
       "Read access is not required."
    OBJECT      syslogMsgMsgID
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
       "Read access is not required."
    OBJECT      syslogMsgSDParams
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
       "Read access is not required."
    OBJECT      syslogMsgMsg
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
       "Read access is not required."
    OBJECT      syslogMsgSDParamValue
    MIN-ACCESS  accessible-for-notify
    DESCRIPTION
       "Read access is not required."
```

```
    ::= { syslogMsgCompliances 3 }

 syslogMsgNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS {
        syslogMsgNotification
    }
    STATUS      current
    DESCRIPTION
       "The notifications emitted by this MIB module."
    ::= { syslogMsgGroups 1 }

 syslogMsgGroup OBJECT-GROUP
    OBJECTS {
        -- syslogMsgIndex,
        syslogMsgFacility,
        syslogMsgSeverity,
        syslogMsgVersion,
        syslogMsgTimeStamp,
        syslogMsgHostName,
        syslogMsgAppName,
        syslogMsgProcID,
        syslogMsgMsgID,
        syslogMsgSDParams,
        syslogMsgMsg
    }
    STATUS      current
    DESCRIPTION
       "A collection of objects representing a SYSLOG message,
        excluding structured data elements."
    ::= { syslogMsgGroups 2 }

 syslogMsgSDGroup OBJECT-GROUP
    OBJECTS {
        -- syslogMsgSDParamIndex,
        -- syslogMsgSDID,
        -- syslogMsgSDParamName,
        syslogMsgSDParamValue
    }
    STATUS      current
    DESCRIPTION
       "A collection of objects representing the structured data
        elements of a SYSLOG message."
    ::= { syslogMsgGroups 3 }

 syslogMsgControlGroup OBJECT-GROUP
    OBJECTS {
        syslogMsgTableMaxSize,
        syslogMsgEnableNotifications
```

```
    }
    STATUS      current
    DESCRIPTION
       "A collection of control objects to control the size of the
        syslogMsgTable and to enable/disable notifications."
    ::= { syslogMsgGroups 4 }

END
```

8. Usage Example

The following example shows a valid SYSLOG message including structured data. The otherwise-unprintable Unicode byte order mark (BOM) is represented as "BOM" in the example.

```
<165>1 2003-10-11T22:14:15.003Z mymachine.example.com
evntslog - ID47 [exampleSDID@32473 iut="3" eventSource="Application"
eventID="1011"] BOMAn application event log entry...
```

This SYSLOG message leads to the following entries in the syslogMsgTable and the syslogMsgSDTable (note that string indexes are written as strings for readability reasons):

```
  syslogMsgIndex.1 = 1
  syslogMsgFacility.1 = 20
  syslogMsgSeverity.1 = 5
  syslogMsgVersion.1 = 1
  syslogMsgTimeStamp.1 = 2003-10-11,22:14:15.003,+0:0
  syslogMsgHostName.1 = "mymachine.example.com"
  syslogMsgAppName.1 = "evntslog"
  syslogMsgProcID.1 = "-"
  syslogMsgMsgID.1 = "ID47"
  syslogMsgMsg.1 = "BOMAn application event log entry..."
  syslogMsgSDParamValue.1.1."exampleSDID@32473"."iut"
      = "3"
  syslogMsgSDParamValue.1.2."exampleSDID@32473"."eventSource"
      = "Application"
  syslogMsgSDParamValue.1.3."exampleSDID@32473"."eventID"
      = "1011"
```

9. IANA Considerations

The IANA has assigned value "192" under the ’mib-2’ subtree and recorded the assignment in the SMI Numbers registry.

10. Security Considerations

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:

- syslogMsgTableMaxSize: This object controls how many entries are kept in the syslogMsgTable. Unauthorized modifications may either cause increased memory consumption (by setting this object to a large value) or turn off the capability to retrieve notifications using GET class operations (by setting this object to zero). This might be used to hide traces of an attack.

- syslogMsgEnableNotifications: This object enables notifications. Unauthorized modifications to disable notification generation can be used to hide an attack by preventing management applications that use SNMP from receiving real-time notifications about events carried in SYSLOG messages. Unauthorized modifications to enable notification generation may be used as part of a denial-of-service attack against a network management system if, for example, the SYSLOG-to-SNMP translator accepts unauthorized SYSLOG messages.

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. These are the tables and objects and their sensitivity/vulnerability:

- syslogMsgTableMaxSize, syslogMsgEnableNotifications: These objects provide information regarding whether SYSLOG messages are forwarded as SNMP notifications and how many messages will be maintained in the syslogMsgTable. This information might be exploited by an attacker in order to plan actions with the goal of hiding attack activities.

- syslogMsgFacility, syslogMsgSeverity, syslogMsgVersion, syslogMsgTimeStamp, syslogMsgHostName, syslogMsgAppName, syslogMsgProcID, syslogMsgMsgID, syslogMsgSDParams, syslogMsgMsg, syslogMsgSDParamValue: These objects carry the content of SYSLOG messages and the SYSLOG-message-oriented security considerations of [RFC5424] apply. In particular, an attacker who gains access to SYSLOG messages via SNMP may use the knowledge gained from

SYSLOG messages to compromise a machine or do other damage. It is therefore desirable to configure SNMP access control rules, enforcing a consistent security policy for SYSLOG messages.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPsec), even then, 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.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [RFC3410], section 8), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

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.

Using the security features of the SNMPv3 framework secures the transport of SYSLOG data via SNMP only. It is therefore RECOMMENDED that deployments use SYSLOG security mechanisms in order to prevent attackers from adding malicious SYSLOG data to the MIB tables.

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