Network Working Group
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Manager-to-Manager Management Information Base

Status of this Memo

This RFC specifes an IAB standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "IAB Official Protocol Standards" for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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1. Introduction

A network management system contains: several (potentially many) nodes, each with a processing entity, termed an agent, which has access to management instrumentation; at least one management station; and, a management protocol, used to convey management information between the agents and management stations. Operations of the protocol are carried out under an administrative framework which defines both authentication and authorization policies.

Network management stations execute management applications which monitor and control network elements. Network elements are devices such as hosts, routers, terminal servers, etc., which are monitored and controlled through access to their management information.

Management information is viewed as a collection of managed objects, residing in a virtual information store, termed the Management Information Base (MIB). Collections of related objects are defined in MIB modules. These modules are written using a subset of OSI's Abstract Syntax Notation One (ASN.1) [1], termed the Structure of Management Information (SMI) [2].

The management protocol, version 2 of the Simple Network Management Protocol [3], provides for the exchange of messages which convey management information between the agents and the management stations, including between management stations. It is the purpose of this document to define managed objects which describe the behavior of a SNMPv2 entity acting in both a manager role and an agent role.

1.1. A Note on Terminology

For the purpose of exposition, the original Internet-standard Network Management Framework, as described in RFCs 1155, 1157, and 1212, is termed the SNMP version 1 framework (SNMPv1). The current framework is termed the SNMP version 2 framework (SNMPv2).

2. Overview

The purpose of this MIB is to provide the means for coordination between multiple management stations. That is, the means by which the controlling and monitoring functions of network management can be distributed amongst multiple management stations. Such distribution facilitates the scaling of network management solutions based on the SNMPv2 to meet the needs of very large networks, or of networks composed of multiple interconnected administrations. Specifically, this MIB provides the means for one management station to request management services from another management station.

2.1. A SNMPv2 Entity Acting in a Dual Role

A management station providing services to other management station(s), is a SNMPv2 entity which acts in the dual role of both manager and agent; the requests for service are received through acting in an agent role (with respect to the managed objects defined in this MIB), and the requested services are performed through acting in a manager role.

2.2. Alarms, Events, and Notifications

In this initial version, this MIB defines the concepts of "alarms", "events", and "notifications". Each alarm is a specific condition detected through the periodic (at a configured sampling interval) monitoring of the value of a specific management information variable. An example of an alarm condition is when the monitored variable falls outside a configured range. Each alarm condition triggers an event, and each event can cause (one or more) notifications to be reported to other management stations using the Inform-Request PDU.

Specifically, this MIB defines three MIB tables and a number of scalar objects. The three tables are: the Alarm Table, the Event Table, and the Notification Table.

2.3. Access Control

The Administrative Model for SNMPv2 document [4] includes an access control model, which must not be subverted by allowing access to management information variables via the Alarm table. That is, access to a monitored variable via the Alarm table must be controlled according to the identity of the management station accessing the particular entry in the Alarm table.

An entry in the Alarm table provides the means to configure the sampling of the value of a MIB variable in the MIB view associated with the specified context (which can refer to object resources that are either local or remote). The sampling is done by (conceptually or actually) issuing a SNMPv2 request to retrieve the variable's value. This request is authenticated and/or protected from disclosure according to a source party and a destination party pair which has access to the indicated context.

Thus, to provide the required access control, the initial MIB view assigned, by convention, to parties on SNMPv2 entities that implement the snmpAlarmTable, must include the component:

```
viewSubtree  = { snmpAlarm }
viewStatus   = { excluded }
viewMask     = { ''H }
```

Then, the MIB view associated with the context, requestContext, accessible by a requesting management station, can be configured to include specific Alarm table entries -- the ones associated with those contexts to which the requesting management station has access.

In particular, to provide a requestContext with access to the sampling context sampleContext, the following family of view subtrees would be included for the requestContext on the SNMPv2 entity acting in a dual role:

```
{ snmpAlarmEntry WILDCARD sampleContext }
```

Which would be configured in the party MIB [5] as:

```
contextIdentity   = { requestContext }
contextViewIndex  = { ViewIndex }
```

```
viewIndex         = { ViewIndex }
viewSubtree       = { snmpAlarmEntry 0 sampleContext }
viewStatus        = { included }
viewMask          = { 'FFEF'H } -- specifies wildcard for column
```

3. Definitions

```
SNMPv2-M2M-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,
    Integer32, Counter32, snmpModules
        FROM SNMPv2-SMI
    DisplayString, InstancePointer, RowStatus, TimeStamp
        FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP
        FROM SNMPv2-CONF
    contextIdentity
        FROM SNMPv2-PARTY-MIB;


snmpM2M MODULE-IDENTITY
    LAST-UPDATED "9304010000Z"
    ORGANIZATION "IETF SNMPv2 Working Group"
    CONTACT-INFO
            "        Steven Waldbusser

             Postal: Carnegie Mellon University
                     4910 Forbes Ave
                     Pittsburgh, PA  15213

                Tel: +1 412 268 6628
                Fax: +1 412 268 4987

             E-mail: waldbusser@cmu.edu"
    DESCRIPTION
            "The Manager-to-Manager MIB module."
    ::= { snmpModules 2 }


snmpM2MObjects OBJECT IDENTIFIER ::= { snmpM2M 1 }
```

```
-- the alarm group
--
-- a collection of objects allowing the description and
-- configuration of threshold alarms from a SNMPv2 entity
-- acting in a dual role.

snmpAlarm      OBJECT IDENTIFIER ::= { snmpM2MObjects 1 }

-- This Alarm mechanism periodically takes statistical samples
-- from variables available via SNMPv2 and compares them to
-- thresholds that have been configured.  The alarm table
-- stores configuration entries that each define a variable,
-- polling period, and threshold parameters.  If a sample is
-- found to cross the threshold values, an event is generated.
-- Only variables that resolve to an ASN.1 primitive type of
-- INTEGER (Integer32, Counter32, Gauge32, TimeTicks,
-- Counter64, or UInteger32) may be monitored in this way.
--
-- This function has a hysteresis mechanism to limit the
-- generation of events.  This mechanism generates one event
-- as a threshold is crossed in the appropriate direction.  No
-- more events are generated for that threshold until the
-- opposite threshold is crossed.
--
-- In the case of sampling a deltaValue, an entity may
-- implement this mechanism with more precision if it takes a
-- delta sample twice per period, each time comparing the sum
-- of the latest two samples to the threshold.  This allows
-- the detection of threshold crossings that span the sampling
-- boundary.  Note that this does not require any special
-- configuration of the threshold value.  It is suggested that
-- entities implement this more precise algorithm.
--
```

```
snmpAlarmNextIndex OBJECT-TYPE
    SYNTAX     INTEGER (0..65535)
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
            "The index number of the next appropriate
            unassigned entry in the snmpAlarmTable.  The value
            0 indicates that no unassigned entries are
            available.

            A management station should create new entries in
            the snmpAlarmTable using this algorithm: first,
            issue a management protocol retrieval operation to
            determine the value of snmpAlarmNextIndex; and,
            second, issue a management protocol set operation
            to create an instance of the snmpAlarmStatus
            object setting its value to 'createAndGo' or
            'createAndWait' (as specified in the description
            of the RowStatus textual convention)."
    ::= { snmpAlarm 1 }

snmpAlarmTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF SnmpAlarmEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "A list of snmpAlarm entries."
    ::= { snmpAlarm 2 }

snmpAlarmEntry OBJECT-TYPE
    SYNTAX     SnmpAlarmEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "A list of parameters that set up a periodic
            sampling query to check for alarm conditions.  The
            contextIdentity included in the INDEX clause is
            the context to which the sampling queries are
            directed."
    INDEX      { contextIdentity, snmpAlarmIndex }
    ::= { snmpAlarmTable 1 }
```

```
SnmpAlarmEntry ::= SEQUENCE {
    snmpAlarmIndex                    INTEGER,
    snmpAlarmVariable                 InstancePointer,
    snmpAlarmInterval                 Integer32,
    snmpAlarmSampleType               INTEGER,
    snmpAlarmValue                    Integer32,
    snmpAlarmStartupAlarm             INTEGER,
    snmpAlarmRisingThreshold          Integer32,
    snmpAlarmFallingThreshold         Integer32,
    snmpAlarmRisingEventIndex         INTEGER,
    snmpAlarmFallingEventIndex        INTEGER,
    snmpAlarmUnavailableEventIndex    INTEGER,
    snmpAlarmStatus                   RowStatus
}

snmpAlarmIndex OBJECT-TYPE
    SYNTAX     INTEGER (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "An index that uniquely identifies an entry in the
            snmpAlarm table for a particular sampling context.
            Each such entry defines a diagnostic sample at a
            particular interval for a variable in the
            particular context's object resources."
    ::= { snmpAlarmEntry 1 }
```

```
snmpAlarmVariable OBJECT-TYPE
    SYNTAX     InstancePointer
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The object identifier of the particular variable
            to be sampled.  Only variables that resolve to an
            ASN.1 primitive type of INTEGER (Integer32,
            Counter32, Gauge32, TimeTicks, Counter64, or
            UInteger32) may be sampled.

            If it is detected by an error response of
            authorizationError, noSuchObject, or
            noSuchInstance that the variable name of an
            established snmpAlarmEntry is no longer available
            in the sampling context, a single
            snmpObjectUnavailableAlarm event is generated and
            the status of this snmpAlarmEntry is set to
            'destroy'.  Likewise, if the syntax of the
            variable retrieved by the query is not Integer32,
            Counter32, Gauge32, TimeTicks, Counter64, or
            UInteger32, the same actions will be taken.

            If the SNMPv2 entity acting in a dual role detects
            that the sampled value can not be obtained due to
            lack of response to management queries, it should
            either:

                 1) Set the status of this snmpAlarmEntry to
                 'destroy', if it is determined that further
                 communication is not possible;

                 or,

                 2) Delete the associated snmpAlarmValue
                 instance (but not the entire conceptual row),
                 and continue to attempt to sample the
                 variable and recreate the associated
                 snmpAlarmValue instance should communication
                 be reestablished.

            An attempt to modify this object will fail with an
            'inconsistentValue' error if the associated
            snmpAlarmStatus object would be equal to 'active'
            both before and after the modification attempt."
```

```
    ::= { snmpAlarmEntry 2 }

snmpAlarmInterval OBJECT-TYPE
    SYNTAX     Integer32
    UNITS      "seconds"
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The interval in seconds over which the data is
            sampled and compared with the rising and falling
            thresholds.  When setting this object and the
            sampling type is 'deltaValue',  care should be
            taken to ensure that the change during this
            interval of the variable being sampled will not
            exceed the (-2^31...2^31-1) range of the
            snmpAlarmValue.

            An attempt to modify this object will fail with an
            'inconsistentValue' error if the associated
            snmpAlarmStatus object would be equal to 'active'
            both before and after the modification attempt."
    ::= { snmpAlarmEntry 3 }
```

```
snmpAlarmSampleType OBJECT-TYPE
    SYNTAX     INTEGER {
                   absoluteValue(1),
                   deltaValue(2)
               }
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The method of sampling the selected variable and
            calculating the value to be compared against the
            thresholds.  If the value of this object is
            'absoluteValue', the value of the selected
            variable at the end of the sampling interval will
            be compared directly with both the
            snmpAlarmRisingThreshold and the
            snmpAlarmFallingThreshold values.  If the value of
            this object is 'deltaValue', the value of the
            selected variable at the end of the sampling
            interval will be subtracted from its value at the
            end of the previous sampling interval, and the
            difference compared with both the
            snmpAlarmRisingThreshold and the
            snmpAlarmFallingThreshold values.

            An attempt to modify this object will fail with an
            'inconsistentValue' error if the associated
            snmpAlarmStatus object would be equal to 'active'
            both before and after the modification attempt."
    DEFVAL { deltaValue }
    ::= { snmpAlarmEntry 4 }
```

```
snmpAlarmValue OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
            "The value of the statistic during the last
            sampling period.  The value during the current
            sampling period is not made available until the
            period is completed.  If the value of the
            statistic does not fit in the signed 32 bit
            representation of this object, it should be
            truncated in an implementation specific manner.

            Note that if the associated snmpAlarmSampleType is
            set to 'deltaValue', the value of this object is
            the difference in the sampled variable since the
            last sample.

            This object will be created by the SNMPv2 entity
            acting in a dual role when this entry is set to
            'active', and the first sampling period has
            completed.  It may be created and deleted at other
            times by the SNMPv2 entity acting in a dual role
            when the sampled value can not be obtained, as
            specified in the snmpAlarmVariable object."
    ::= { snmpAlarmEntry 5 }
```

```
snmpAlarmStartupAlarm OBJECT-TYPE
    SYNTAX     INTEGER {
                   risingAlarm(1),
                   fallingAlarm(2),
                   risingOrFallingAlarm(3)
               }
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The alarm that may be sent when this entry is
            first set to 'active'.  If the first sample after
            this entry becomes active is greater than or equal
            to the risingThreshold and snmpAlarmStartupAlarm
            is equal to 'risingAlarm' or
            'risingOrFallingAlarm', then a single rising alarm
            will be generated.  If the first sample after this
            entry becomes active is less than or equal to the
            fallingThreshold and snmpAlarmStartupAlarm is
            equal to 'fallingAlarm' or 'risingOrFallingAlarm',
            then a single falling alarm will be generated.
            Note that a snmpObjectUnavailableAlarm is sent
            upon startup whenever it is applicable,
            independent of the setting of
            snmpAlarmStartupAlarm.

            An attempt to modify this object will fail with an
            'inconsistentValue' error if the associated
            snmpAlarmStatus object would be equal to 'active'
            both before and after the modification attempt."
    DEFVAL { risingOrFallingAlarm }
    ::= { snmpAlarmEntry 6 }
```

```
snmpAlarmRisingThreshold OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "A threshold for the sampled statistic.  When the
            current sampled value is greater than or equal to
            this threshold, and the value at the last sampling
            interval was less than this threshold, a single
            event will be generated.  A single event will also
            be generated if the first sample after this entry
            becomes active is greater than or equal to this
            threshold and the associated snmpAlarmStartupAlarm
            is equal to 'risingAlarm' or
            'risingOrFallingAlarm'.

            After a rising event is generated, another such
            event will not be generated until the sampled
            value falls below this threshold and reaches the
            snmpAlarmFallingThreshold.

            An attempt to modify this object will fail with an
            'inconsistentValue' error if the associated
            snmpAlarmStatus object would be equal to 'active'
            both before and after the modification attempt."
    ::= { snmpAlarmEntry 7 }
```

```
snmpAlarmFallingThreshold OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "A threshold for the sampled statistic.  When the
            current sampled value is less than or equal to
            this threshold, and the value at the last sampling
            interval was greater than this threshold, a single
            event will be generated.  A single event will also
            be generated if the first sample after this entry
            becomes active is less than or equal to this
            threshold and the associated snmpAlarmStartupAlarm
            is equal to 'fallingAlarm' or
            'risingOrFallingAlarm'.

            After a falling event is generated, another such
            event will not be generated until the sampled
            value rises above this threshold and reaches the
            snmpAlarmRisingThreshold.

            An attempt to modify this object will fail with an
            'inconsistentValue' error if the associated
            snmpAlarmStatus object would be equal to 'active'
            both before and after the modification attempt."
    ::= { snmpAlarmEntry 8 }
```

```
snmpAlarmRisingEventIndex OBJECT-TYPE
    SYNTAX     INTEGER (0..65535)
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The index of the snmpEventEntry that is used when
            a rising threshold is crossed.  The snmpEventEntry
            identified by a particular value of this index is
            the same as identified by the same value of the
            snmpEventIndex object.  If there is no
            corresponding entry in the snmpEventTable, then no
            association exists.  In particular, if this value
            is zero, no associated event will be generated, as
            zero is not a valid snmpEventIndex.

            An attempt to modify this object will fail with an
            'inconsistentValue' error if the associated
            snmpAlarmStatus object would be equal to 'active'
            both before and after the modification attempt."
    ::= { snmpAlarmEntry 9 }
```

```
snmpAlarmFallingEventIndex OBJECT-TYPE
    SYNTAX     INTEGER (0..65535)
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The index of the snmpEventEntry that is used when
            a falling threshold is crossed.  The
            snmpEventEntry identified by a particular value of
            this index is the same as identified by the same
            value of the snmpEventIndex object.  If there is
            no corresponding entry in the snmpEventTable, then
            no association exists.  In particular, if this
            value is zero, no associated event will be
            generated, as zero is not a valid snmpEventIndex.

            An attempt to modify this object will fail with an
            'inconsistentValue' error if the associated
            snmpAlarmStatus object would be equal to 'active'
            both before and after the modification attempt."
    ::= { snmpAlarmEntry 10 }

snmpAlarmUnavailableEventIndex OBJECT-TYPE
    SYNTAX     INTEGER (0..65535)
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The index of the snmpEventEntry that is used when
            a variable becomes unavailable.  The
            snmpEventEntry identified by a particular value of
            this index is the same as identified by the same
            value of the snmpEventIndex object.  If there is
            no corresponding entry in the snmpEventTable, then
            no association exists.  In particular, if this
            value is zero, no associated event will be
            generated, as zero is not a valid snmpEventIndex.

            An attempt to modify this object will fail with an
            'inconsistentValue' error if the associated
            snmpAlarmStatus object would be equal to 'active'
            both before and after the modification attempt."
    ::= { snmpAlarmEntry 11 }
```

```
snmpAlarmStatus OBJECT-TYPE
    SYNTAX     RowStatus
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The status of this snmpAlarm entry.  This object
            may not be set to 'active' unless the following
            columnar objects exist in this row:
            snmpAlarmVariable, snmpAlarmInterval,
            snmpAlarmSampleType, snmpAlarmStartupAlarm,
            snmpAlarmRisingThreshold,
            snmpAlarmFallingThreshold,
            snmpAlarmRisingEventIndex,
            snmpAlarmFallingEventIndex, and
            snmpAlarmUnavailableEventIndex."
    ::= { snmpAlarmEntry 12 }
```

```
-- alarm-related notifications

snmpAlarmNotifications
              OBJECT IDENTIFIER ::= { snmpAlarm 3 }

snmpRisingAlarm NOTIFICATION-TYPE
    OBJECTS { snmpAlarmVariable, snmpAlarmSampleType,
              snmpAlarmValue, snmpAlarmRisingThreshold }
    STATUS  current
    DESCRIPTION
            "An event that is generated when an alarm entry
            crosses its rising threshold.  The instances of
            those objects contained within the varbind list
            are those of the alarm entry which generated this
            event."
    ::= { snmpAlarmNotifications 1 }

snmpFallingAlarm NOTIFICATION-TYPE
    OBJECTS { snmpAlarmVariable, snmpAlarmSampleType,
              snmpAlarmValue, snmpAlarmFallingThreshold }
    STATUS  current
    DESCRIPTION
            "An event that is generated when an alarm entry
            crosses its falling threshold.  The instances of
            those objects contained within the varbind list
            are those of the alarm entry which generated this
            event."
    ::= { snmpAlarmNotifications 2 }

snmpObjectUnavailableAlarm NOTIFICATION-TYPE
    OBJECTS { snmpAlarmVariable }
    STATUS  current
    DESCRIPTION
            "An event that is generated when a variable
            monitored by an alarm entry becomes unavailable.
            The instance of snmpAlarmVariable contained within
            the varbind list is the one associated with the
            alarm entry which generated this event."
    ::= { snmpAlarmNotifications 3 }
```

```
-- the event group
--
-- a collection of objects allowing the description and
-- configuration of events from a SNMPv2 entity acting
-- in a dual role.

snmpEvent      OBJECT IDENTIFIER ::= { snmpM2MObjects 2 }

-- The snmpEvent table defines the set of events generated on
-- a SNMPv2 entity acting in a dual role.  Each entry in the
-- snmpEventTable associates an event type with the
-- notification method and associated parameters.  Some
-- snmpEvent entries are fired by an associated condition in
-- the snmpAlarmTable.  Others are fired on behalf of
-- conditions defined in the NOTIFICATION-TYPE macro.  The
-- snmpNotificationTable defines notifications that should
-- occur when an associated event is fired.

snmpEventNextIndex OBJECT-TYPE
    SYNTAX     INTEGER (0..65535)
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
            "The index number of the next appropriate
            unassigned entry in the snmpEventTable.  The value
            0 indicates that no unassigned entries are
            available.

            A management station should create new entries in
            the snmpEventTable using this algorithm: first,
            issue a management protocol retrieval operation to
            determine the value of snmpEventNextIndex; and,
            second, issue a management protocol set operation
            to create an instance of the snmpEventStatus
            object setting its value to 'createAndWait' or
            'createAndGo'."
    ::= { snmpEvent 1 }
```

```
snmpEventTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF SnmpEventEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "A list of events."
    ::= { snmpEvent 2 }

snmpEventEntry OBJECT-TYPE
    SYNTAX     SnmpEventEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "A set of parameters that describe an event that
            is generated when certain conditions are met."
    INDEX      { snmpEventIndex }
    ::= { snmpEventTable 1 }

SnmpEventEntry ::= SEQUENCE {
    snmpEventIndex          INTEGER,
    snmpEventID             OBJECT IDENTIFIER,
    snmpEventDescription    DisplayString,
    snmpEventEvents         Counter32,
    snmpEventLastTimeSent   TimeStamp,
    snmpEventStatus         RowStatus
}

snmpEventIndex OBJECT-TYPE
    SYNTAX     INTEGER (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "An index that uniquely identifies an entry in the
            snmpEvent table.  Each such entry defines an event
            generated when the appropriate conditions occur."
    ::= { snmpEventEntry 1 }
```

```
snmpEventID OBJECT-TYPE
    SYNTAX     OBJECT IDENTIFIER
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The authoritative identification of the event
            type generated by this entry.  This variable
            occurs as the second varbind of an InformRequest-
            PDU.  If this OBJECT IDENTIFIER maps to a
            NOTIFICATION-TYPE the sender will place the
            objects listed in the NOTIFICATION-TYPE in the
            varbind list."
    ::= { snmpEventEntry 2 }

snmpEventDescription OBJECT-TYPE
    SYNTAX     DisplayString (SIZE (0..127))
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "A comment describing this snmpEvent entry."
    ::= { snmpEventEntry 3 }

snmpEventEvents OBJECT-TYPE
    SYNTAX     Counter32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
            "The number of events caused by event generators
            associated with this snmpEvent entry."
    ::= { snmpEventEntry 4 }
```

```
snmpEventLastTimeSent OBJECT-TYPE
    SYNTAX     TimeStamp
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
            "The value of sysUpTime at the time this snmpEvent
            entry last generated an event.  If this entry has
            not generated any events, this value will be
            zero."
    DEFVAL { 0 }
    ::= { snmpEventEntry 5 }

snmpEventStatus OBJECT-TYPE
    SYNTAX     RowStatus
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The status of this snmpEvent entry.  This object
            may not be set to 'active' unless the following
            columnar objects exist in this row: snmpEventID,
            snmpEventDescription, snmpEventEvents, and
            snmpEventLastTimeSent.

            Setting an instance of this object to the value
            'destroy' has the effect of invalidating any/all
            entries in the snmpEventTable, and the
            snmpEventNotifyTable which reference the
            corresponding snmpEventEntry."
    ::= { snmpEventEntry 6 }
```

```
snmpEventNotifyMinInterval OBJECT-TYPE
    SYNTAX     Integer32
    UNITS      "seconds"
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
            "The minimum interval that the SNMPv2 entity
            acting in a dual role will wait before
            retransmitting an InformRequest-PDU.  This object
            specifies the minimal value supported by the
            SNMPv2 entity acting in a dual role, based on
            resource or implementation constraints.

            For a particular entry in the
            snmpEventNotifyTable, if the associated
            snmpEventNotifyIntervalRequested variable is
            greater than this object, the
            snmpEventNotifyIntervalRequested value shall be
            used as the minimum interval for retransmissions
            of InformRequest-PDUs sent on behalf of that
            entry."
    ::= { snmpEvent 3 }

snmpEventNotifyMaxRetransmissions OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
            "The maximum number of time that the SNMPv2 entity
            acting in a dual role will retransmit an
            InformRequest-PDU.  This object specifies the
            maximal value supported by the SNMPv2 entity
            acting in a dual role, based on resource or
            implementation constraints.

            For a particular entry in the
            snmpEventNotifyTable, if the associated
            snmpEventNotifyRetransmissionsRequested variable
            is less than this object, the
            snmpEventNotifyRetransmissionsRequested value
            shall be used as the retransmission count for
            InformRequest-PDUs sent on behalf of that entry."
    ::= { snmpEvent 4 }

-- The snmpEventNotifyTable is used to configure the
```

```
-- destination and type of notifications sent by a SNMPv2
-- entity acting in a manager role when a particular event
-- is triggered.

snmpEventNotifyTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF SnmpEventNotifyEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "A list of protocol configuration entries for
            event notifications from this entity."
    ::= { snmpEvent 5 }

snmpEventNotifyEntry OBJECT-TYPE
    SYNTAX     SnmpEventNotifyEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
            "A set of parameters that describe the type and
            destination of InformRequest-PDUs sent for a
            particular event.  The snmpEventIndex in this
            entry's INDEX clause identifies the snmpEventEntry
            which, when triggered, will generate a
            notification as configured in this entry.  The
            contextIdentity in this entry's INDEX clause
            identifies the context to which a notification
            will be sent."
    INDEX      { snmpEventIndex, contextIdentity }
    ::= { snmpEventNotifyTable 1 }

SnmpEventNotifyEntry ::= SEQUENCE {
    snmpEventNotifyIntervalRequested        Integer32,
    snmpEventNotifyRetransmissionsRequested Integer32,
    snmpEventNotifyLifetime                 Integer32,
    snmpEventNotifyStatus                   RowStatus
}
```

```
snmpEventNotifyIntervalRequested OBJECT-TYPE
    SYNTAX     Integer32
    UNITS      "seconds"
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The requested interval for retransmission of
            Inform PDUs generated on the behalf of this entry.

            This variable will be the actual interval used
            unless the snmpEventNotifyMinInterval is greater
            than this object, in which case the interval shall
            be equal to snmpEventNotifyMinInterval."
    DEFVAL { 30 }
    ::= { snmpEventNotifyEntry 1 }

snmpEventNotifyRetransmissionsRequested OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The requested number of retransmissions of an
            InformRequest-PDU generated on behalf of this
            entry.

            This variable will be the actual number of
            retransmissions used unless the
            snmpEventNotifyMaxRetransmissions is less than
            this object, in which case the retransmission
            count shall be equal to
            snmpEventNotifyMaxRetransmissions."
    DEFVAL { 5 }
    ::= { snmpEventNotifyEntry 2 }
```

```
snmpEventNotifyLifetime OBJECT-TYPE
    SYNTAX     Integer32
    UNITS      "seconds"
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The number of seconds this entry shall live until
            the corresponding instance of
            snmpEventNotifyStatus is set to 'destroy'.  This
            value shall count down to zero, at which time the
            corresponding instance of snmpEventNotifyStatus
            will be set to 'destroy'.  Any management station
            that is using this entry must periodically refresh
            this value to ensure the continued delivery of
            events."
    DEFVAL { 86400 }
    ::= { snmpEventNotifyEntry 3 }

snmpEventNotifyStatus OBJECT-TYPE
    SYNTAX     RowStatus
    MAX-ACCESS read-create
    STATUS     current
    DESCRIPTION
            "The state of this snmpEventNotifyEntry.  This
            object may not be set to 'active' unless the
            following columnar objects exist in this row:
            snmpEventNotifyIntervalRequested,
            snmpEventNotifyRetransmissionsRequested, and
            snmpEventNotifyLifetime."
    ::= { snmpEventNotifyEntry 4 }
```

```
-- conformance information

snmpM2MConformance
              OBJECT IDENTIFIER ::= { snmpM2M 2 }

snmpM2MCompliances
              OBJECT IDENTIFIER ::= { snmpM2MConformance 1 }
snmpM2MGroups  OBJECT IDENTIFIER ::= { snmpM2MConformance 2 }


-- compliance statements

snmpM2MCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
            "The compliance statement for SNMPv2 entities
            which implement the Manager-to-Manager MIB."
    MODULE  -- this module
        MANDATORY-GROUPS { snmpAlarmGroup, snmpEventGroup }
    ::= { snmpM2MCompliances 1 }


-- units of conformance

snmpAlarmGroup OBJECT-GROUP
    OBJECTS { snmpAlarmNextIndex,
              snmpAlarmVariable, snmpAlarmInterval,
              snmpAlarmSampleType, snmpAlarmValue,
              snmpAlarmStartupAlarm, snmpAlarmRisingThreshold,
              snmpAlarmFallingThreshold,
              snmpAlarmRisingEventIndex,
              snmpAlarmFallingEventIndex,
              snmpAlarmUnavailableEventIndex,
              snmpAlarmStatus }
    STATUS  current
    DESCRIPTION
            "A collection of objects allowing the description
            and configuration of threshold alarms from a
            SNMPv2 entity acting in a dual role."
    ::= { snmpM2MGroups 1 }
```

```
snmpEventGroup OBJECT-GROUP
    OBJECTS { snmpEventNextIndex,
              snmpEventID, snmpEventDescription,
              snmpEventEvents, snmpEventLastTimeSent,
              snmpEventStatus, snmpEventNotifyMinInterval,
              snmpEventNotifyMaxRetransmissions,
              snmpEventNotifyIntervalRequested,
              snmpEventNotifyRetransmissionsRequested,
              snmpEventNotifyLifetime, snmpEventNotifyStatus }
    STATUS  current
    DESCRIPTION
            "A collection of objects allowing the description
            and configuration of events from a SNMPv2 entity
            acting in a dual role."
    ::= { snmpM2MGroups 2 }


END
```

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6. Security Considerations

Security issues are not discussed in this memo.

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