

Disman Working Group  
Internet Draft  
Document: [draft-ietf-disman-alarm-mib-18.txt](#)  
Category: Standards Track  
Expiration Date: July 2004

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February 2004

## **Alarm MIB**

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### 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 describes management objects used for modelling and storing alarms.

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## **1. The Internet-Standard Management Framework**

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to [section 7 of RFC 3410](#) [[RFC3410](#)].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58, [RFC 2578](#) [[RFC2578](#)], STD 58, [RFC 2579](#) [[RFC2579](#)] and STD 58, [RFC 2580](#) [[RFC2580](#)].

## **2. Introduction**

In traditional SNMP management, problems are detected on an entity either through polling interesting MIB variables, waiting for the entity to send a Notification for a problem, or some combination of the two. This method is somewhat successful, but experience has shown some problems with this approach. Managers monitoring large numbers of entities cannot afford to be polling large numbers of objects on each device. Managers trying to ensure high reliability are unable to accurately determine whether any problems had occurred when they were not monitoring an entity. Finally, it can be time consuming for managers to try to understand the relationships between the various objects they poll, the Notifications they receive and the problems occurring on the entity. Even after detailed analysis they may still be left with an incomplete picture of what problems are occurring. But, it is important for an operator to be able to determine current problems on a system, so they can be fixed.

This memo describes a method of using alarm management in SNMP to address these problems. It also provides the necessary MIB objects to support this method.

Alarms and other terms related to alarm management are defined in the following sections.

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 [RFC 2119](#) [[RFC2119](#)].

## **3. Alarm Management Framework**



### **3.1 Terminology**

#### **Error**

A deviation of a system from normal operation.

#### **Fault**

Lasting error or warning condition.

#### **Event**

Something that happens which may be of interest.

A fault, a change in status, crossing a threshold, or an external input to the system, for example.

#### **Notification**

Unsolicited transmission of management information.

#### **Alarm**

Persistent indication of a fault.

#### **Alarm State**

A condition or stage in the existence of an alarm. As a minimum, alarms states are raise and clear. They could also include severity information such as defined by perceived severity in the International Telecommunications Union (ITU) model [[M.3100](#)]  
- cleared, indeterminate, critical, major, minor and warning.

#### **Alarm Raise**

The initial detection of the fault indicated by an alarm or any number of alarm states later entered, except clear.

#### **Alarm Clear**

The detection that the fault indicated by an alarm no longer exists.

#### **Active Alarm**

An alarm which has an alarm state that has been raised, but not cleared.

#### **Alarm Detection Point**

The entity that detected the alarm.

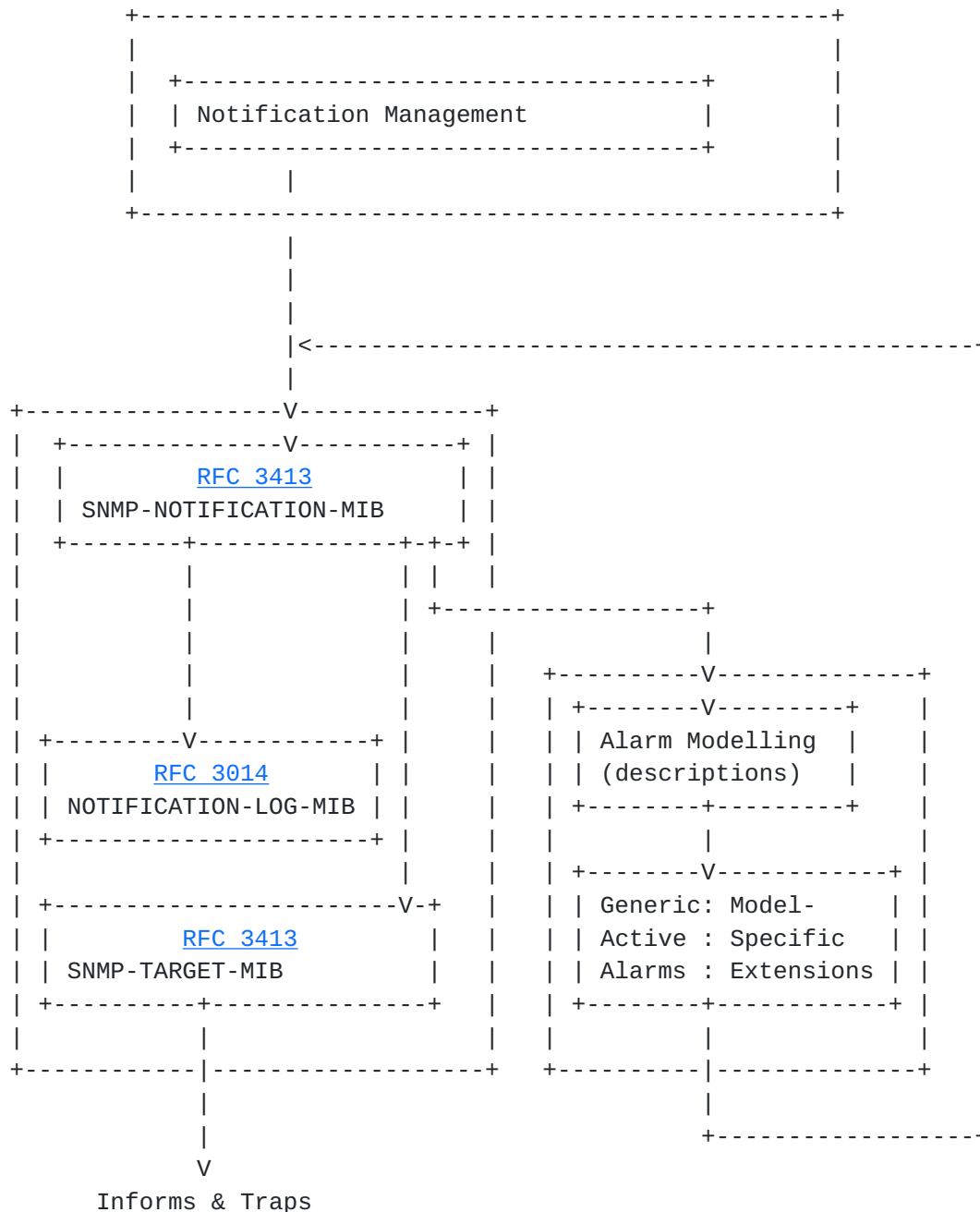
#### **Perceived Severity**

The severity of the alarm as determined by the alarm detection point using the information it has available.

### **3.2 Alarm Management Architecture**







### 3.3 Features of this Architecture

#### 3.3.1 Modular Alarm Architecture

The subject of alarm management can potentially cover a large number of topics including real-time alarms, historical alarms, alarm correlation, and alarm suppression, to name a few. Within each of these topics, there are a number of established models that could be supported. This memo focuses on a subset of this problem space, but

describes a modular SNMP alarm management framework. Alarms SHOULD be modelled so Notifications are sent on alarm Clear.

The framework defines a generic Alarm MIB that can be supported on

its own, or with additional alarm modelling information such as the provided ITU Alarm MIB. In addition, the active alarm tables could also be extended to support additional information about active alarm instances. This framework can also be expanded in the future to support such features as alarm correlation and alarm suppression. This modular architecture means that the cost of supporting alarm management features is proportional to the number of features an implementation supports.

### **3.3.2 Flexible Alarm Modelling**

Alarm models document an understanding between a manager and an agent as to what problems will be reported on a system, how these problems will be reported, and what might possibly happen over the lifetime of this problem.

The alarm modelling method provided in this memo provides flexibility to support implementations with different modelling requirements. All alarms are modelled as a series of states that are related together using an alarm ID. Alarm states can be modelled using traditional Notifications, generic alarm Notifications, or without the use of Notifications.

Alarm states modelled using traditional Notifications would specify a Notification Object Identifier, and optionally an (offset, value) pair of one of the Notification varbinds to identify the state. This alarm state would be entered when the entity generated a Notification that matched this information and the alarm would be added to the active alarm table. This Notification would also get sent on the wire to any destinations, as indicated in the SNMP-TARGET-MIB and SNMP-NOTIFICATION-MIB [[RFC3413](#)].

Alarm states modelled using generic Notifications use the alarmActiveState or alarmClearState Notifications defined in this memo. These alarm states would be entered after being triggered by a stimulus outside the scope of this memo, the alarm would be added to the active alarm table and these generic Notifications would then be sent on the wire to any destinations, as indicated in the SNMP-TARGET-MIB and SNMP-NOTIFICATION-MIB [[RFC3413](#)].

Alarm states modelled without any Notifications would be triggered by some stimulus outside the scope of this memo, the alarm would be added to the active alarm table, but no Notifications would be sent to interested managers.

### **3.3.3 Problem Indication**

The Alarm MIB provides a means to determine whether a given notification is of interest to managers for purposes of alarm

management by permitting inspection of the alarm models. If no entries in the alarmModelTable could match a particular notification, then that notification is not relevant to the alarm

models defined. In addition, information in the alarm model, such as the Notification ID and the description tell exactly what error or warning condition this alarm is indicating. If the ITU-ALARM-MIB is also supported, additional information is provided via the probable cause.

### **3.3.5 Identifying Resource under Alarm**

An important goal of alarm management is to ensure that any detected problems get fixed, so it is necessary to know exactly where this problem is occurring. In addition, it is necessary to be able to tell when alarm instances are raised against the same component, as well as to be able to tell what instance of an alarm is cleared by an instance of an alarm clear.

The Alarm MIB provides a generic method for identifying the resource by extracting and building a resource ID from the Notification varbinds. It records the relevant information needed to locate the source of the alarm.

### **3.3.6 Means of obtaining ITU alarm information**

Alarm Information, as defined in ITU alarm models [[M.3100](#)], is optionally available to implementations through the optional support of the ITU-ALARM-MIB.

### **3.3.7 Configuration of Alarm Models**

An alarm model can be added and removed during runtime. It can be modified assuming it is not being referenced by any active alarm instance.

### **3.3.8 Active Alarm Management**

A list of currently active alarms and supporting statistics on the SNMP entity can be obtained.

This allows the network management station to find out about any problems that may have occurred before it started managing a particular network element, or while it was out of contact with it.

### **3.3.9 Distributed Alarm Management**

All aspects of the Alarm MIB can be supported both on the device experiencing the alarms and on any mid-level managers that might be monitoring such devices.

### **3.3.10 Historical Alarm Management**

Some systems may have a requirement that information on alarms that are no longer active is available. This memo provides a clear table to support this requirement.

This can also be achieved through the support of the Notification Log MIB [[RFC3014](#)] to store alarm state transitions.

### **3.4 Security**

Given the nature of VACM, security for alarms is awkward since access control for the objects in the underlying Notifications can be checked only where the Notification is created. Thus such checking is possible only for locally generated Notifications, and even then only when security credentials are available.

For the purpose of this discussion, "security credentials" means the input values for the abstract service interface function `isAccessAllowed` [[RFC3411](#)] and using those credentials means conceptually using that function to see that those credentials allow access to the MIB objects in question, operating as for a Notification Originator in [[RFC3413](#)].

The Alarm MIB has the notion of a named alarm list. By using alarm list names and view-based access control [[RFC3415](#)] a network administrator can provide different access for different users. When an application creates an alarm model (indexed in part by the alarm list name) the security credentials of the creator remain associated with that alarm model and constrain what information is allowed to be placed in the active alarm table, the active alarm variable table, the cleared alarm table, and the ITU alarm table.

When processing locally-generated Notifications, the managed system MUST use the security credentials associated with each alarm model respectively, and MUST apply the same access control rules as described for a Notification Originator in [[RFC3413](#)].

The managed system SHOULD NOT apply access control when processing remotely-generated Notifications using the alarm models. In those cases the security of the information in the alarm tables SHOULD be left to the normal, overall access control for those tables.

### **3.5 Relationship between Alarm and Notifications**

It is important to understand the relationship between alarms and Notifications, as both are traditional fault management methods. This relationship is modelled using the `alarmModelTable` to define the `alarmModelNotificationId` for each alarm state.

Not all Notifications signal an alarm state transition. Some Notifications are simply informational in nature, such as those that indicate that a configuration operation has been performed on an

entity. These sorts of Notifications would not be represented in the Alarm MIB.



The Alarm MIB allows the use of the Notification space as defined in [\[RFC2578\]](#) in order to identify the Notifications that are related with the specific alarm state transitions. However there is no assumption that the respective Notifications must be sent for all or any of the alarm state transitions. It is also possible to model alarms using no Notifications at all. This architecture allows for both the efficient exploitation of the body of defined Notification and for the use of non-Notification based systems.

### **[3.6](#) Notification Varbind Storage and Reference**

In SNMPv1 [\[RFC1157\]](#), the varbinds in the Trap-PDU sent over the wire map one to one into those varbinds listed in the SMI of the trap in the MIB in which it was defined [\[RFC1215\]](#). In the case of linkDown trap, the first varbind can unambiguously be identified as ifIndex. With the introduction of the InformRequest-PDU and SNMPv2-Trap-PDU types, which send sysUptime and snmpTrapOID as the first two varbinds, while the SMI in the MIB where the Notification is defined only lists additional varbinds, the meaning of "first varbind" becomes less clear. In the case of the linkDown Notification, referring to the first varbind could potentially be interpreted as either the sysUptime or ifIndex.

The varbind storage approach taken in the Alarm MIB is that sysUptime and snmpTrapOID SHALL always be stored in the active alarm variable table as entry 1 and 2 respectively, regardless of whether the transport was the Trap-PDU, the InformRequest-PDU or the SNMPv2-Trap-PDU. If the incoming Notification is an SNMPv1 Trap-PDU then an appropriate value for sysUpTime.0 or snmpTrapOID.0 shall be determined by using the rules in [section 3.1 of \[RFC3584\]](#).

The varbind reference approach taken in the Alarm MIB is that, for variables such as the alarmModelVarbindIndex, the first two obligatory varbinds of the InformRequest-PDU and SNMPv2-Trap-PDU need to be considered so the index values of the Trap-PDU and the SMI need be adjusted by two. In the case of linkDown, the third varbind would always be ifIndex.

### **[3.7](#) Relation to Notification Log MIB**

The Alarm MIB is intended to complement the Notification Log MIB [\[RFC3014\]](#), but can be used independently. The alarmActiveTable is defined in manner similar to that of the nlmLogTable. This format allows for the storage of any Trap or Notification type that can be defined using the SMI, or can be carried by SNMP. Using the same format as the Notification Log MIB also simplifies operations for systems choosing to implement both MIBs.

The object `alarmActiveLogPointer` points, for each entry in the `alarmActiveLogTable`, to the log index in the Notification Log MIB, if used.

If the Notification Log MIB is supported, it can be monitored by a management system as a hedge against lost alarms. The Notification Log can also be used to support historical alarm management.

### **3.8 Relationship with the Event MIB**

During the work and discussions in the Working Group, the issue of the relationship between the MIB modules and the Event MIB [[RFC2981](#)] was raised. There is no direct relation or dependency between the Alarm MIB and the Event MIB. Some common terms (like 'event') are being used in both MIB modules, and the user is directed to the sections that define terminology in the two documents for clarification.

## **4. Generic Alarm MIB**

### **4.1 Overview**

The ALARM-MIB consists of alarm models and lists of active and cleared alarms.

The alarmModelTable contains information that is applicable to all instances of an alarm. It can be populated at start-up with all alarms that could happen on a system or later configured by a management application. It contains all the alarms for a given system. If a Notification is not represented in the alarmModelTable, it is not an alarm state transition. The alarmModelTable provides a means of defining the raise/clear and other state transition relationships between alarm states. The alarmModelIndex acts as a unique identifier for an alarm. An alarm model consists of definitions of the possible states an alarm can assume as well as the Object Identifier (OID) of the Notification associated with this alarm state. The object alarmModelState defines the states of an alarm.

The alarmActiveTable contains a list of alarms that are currently occurring on a system. It is intended that this table be queried upon device discovery and rediscovery to determine which alarms are currently active on the device.

The alarmActiveVariableTable contains the Notification variable bindings associated with the alarms in the alarmActiveTable.

The alarmActiveStatsTable contains current and total raised alarm counts as well as the time of the last alarm raise and alarm clears per named alarm list.

The alarmClearTable contains recently cleared alarms. It contains up to alarmClearMaximum cleared alarms.

The MIB also defines generic alarm Notifications that can be used when there is not an existing applicable Notification to signal the

alarm state transition - alarmActiveState and alarmClearState.

#### **4.1.1 Extensibility**

The relationship between the Alarm MIB and the other alarm model MIB modules is expressed by the following: The alarmModelTable has a corresponding table in the specific MIB. For each row in the specific MIB alarm model table there is one row in the alarmModelTable. The alarmActiveTable has a corresponding table in the specific MIBs. For each row in the specific MIB active alarm table, there is one row in the alarmActiveTable. The alarmModelSpecificPointer object in the alarmModelTable points to the specific model entry in an extended alarm model table corresponding to this particular alarm. The alarmActiveSpecificPointer object in the alarmActiveTable points to the specific active alarm entry in an extended active alarm table corresponding to this particular alarm instance.

Additional extensions can be defined by defining an AUGMENTATION of either the Alarm or ITU Alarm tables. As the alarm model table only provides a mechanism to point at one specific alarm model, additional specific models SHOULD define another mechanism to map from the generic alarm model to the additional model.

#### **4.1.2 Problem Indication**

The problem that each alarm indicates is identified through the Object Identifier of the NotificationId of the state transition, and, optionally, the ITU parameters. alarmModelDescription provides a description of the alarm state suitable for displaying to an operator.

#### **4.1.3 Alarm State Transition Notification**

The SNMP-TARGET-MIB [[RFC3413](#)] provides the ability to specify which managers, if any, receive Notifications of problems. Solutions can therefore use the features of this MIB to change the Notification behaviour of their implementations. Specifying target hosts in this MIB along with specifying notifications in the alarmModelNotificationId would allow Notifications to be logged and sent out to management stations in an architecture as described in [section 3.2](#). Specifying no target hosts in this MIB along with specifying notifications in the alarmModelNotificationId would allow Notifications to be logged but not sent out to management stations in an architecture as described in [section 3.2](#). Regardless of what is defined in the SNMP-TARGET-MIB, specifying { 0 0 } in the alarmModelNotificationId would result in no notifications being logged or sent to management stations as a consequence of this

particular alarm state transition.

Alarms are modelled by defining all possible states in the

alarmModelTable, as well as defining alarmModelNotificationId, alarmModelVarbindIndex, and alarmModelVarbindValue for each of the possible alarm states. Optionally, ituAlarmPerceivedSeverity models the states in terms of ITU perceived severity.

#### **4.1.4 Active Alarm Resource Identifier**

Resources under alarm can be identified using the alarmActiveResourceId. This OBJECT IDENTIFIER points to an appropriate object to identify the given resource, depending on the type of the resource.

The consumer of the alarmActiveResourceId does not necessarily need to know the type of the resource in the resource ID, but if they want to know this, examining the content of the resource ID can derive it - 1.3.6.1.2.1.2.2.1.1.something is an interface, for example. It is therefore good practice to use resource IDs that can be consistently used across technologies, such as ifIndex, entPhysicalIndex or sysApplRunIndex, to minimize the number of resource prefixes a manager interested in a resource type needs to learn.

Resource ID can be calculated using the alarmModelResourcePrefix, alarmModelVarbindSubtree and the Notification varbinds. This allows for both the managed element to be able to compute and populate the alarmActiveResourceId object and for the manager to be able to determine when two separate alarm instances are referring to the same resource.

If alarmModelResourcePrefix has a value of 0.0, then alarmActiveResourceId is simply the variable identifier of the first Notification varbind that matches the prefix defined in alarmModelVarbindSubtree. Otherwise, alarmActiveResourceId is calculated by appending the instance information from the first Notification varbind that matches alarmModelVarbindSubtree to the prefix defined in alarmModelResourcePrefix. The instance information is the portion of the variable identifier following the part that matched alarmModelVarbindSubtree. If no match is found, then alarmActiveResourceId is simply the value of alarmModelResourcePrefix.

In addition to this, the variable bindings from the Notifications that signal the alarm state transitions are stored in the active alarm variable table. This allows for implementations familiar with the particular Notifications to implement other forms of resource identification.

For Example:

A) Consider an alarm modelled using the authenticationFailure  
[[RFC3418](#)] Notification.



## authenticationFailure NOTIFICATION-TYPE

STATUS current

## DESCRIPTION

"An authenticationFailure trap signifies that the SNMPv2 entity, acting in an agent role, has received a protocol message that is not properly authenticated. While all implementations of the SNMPv2 must be capable of generating this trap, the snmpEnableAuthenTraps object indicates whether this trap will be generated."

::= { snmpTraps 5 }

To set the resource ID to be usmStats, 1.3.6.1.6.3.15.1.1, configure as follows:

alarmModelVarbindSubtree = 0.0

alarmModelResourcePrefix = usmStats (1.3.6.1.6.3.15.1.1)

B) Consider an alarm modelled using linkDown [[RFC2863](#)]

## linkDown NOTIFICATION-TYPE

OBJECTS { ifIndex, ifAdminStatus, ifOperStatus }

STATUS current

## DESCRIPTION

""

::= { snmpTraps 3 }

To set the resource Id to be the ifIndex, configure as follows:

alarmModelVarbindSubtree = ifIndex (1.3.6.1.2.1.2.2.1.1)

alarmModelResourcePrefix = 0.0

Alternatively, since ifIndex is the first varbind, the following would also work, but might be less meaningful to a human reader of the MIB table:

alarmModelVarbindSubtree = 0.0

alarmModelResourcePrefix = 0.0

C) Consider an alarm modelled using the bgpBackwardTransition [[RFC1657](#)] Notification.

## bgpBackwardTransition NOTIFICATION-TYPE

OBJECTS { bgpPeerLastError,  
                    bgpPeerState        }

STATUS current

## DESCRIPTION

"The BGPBackwardTransition Event is generated when the BGP FSM moves from a higher numbered state to a lower numbered state."

::= { bgpTraps 2 }

To set the resource Id to be the bgpPeerRemoteAddr, the index to

the bgpTable, where bgpPeerState resides, configure as follows:  
alarmModelVarbindSubtree = bgpPeerState  
(1.3.6.1.2.1.15.3.1.2)

```
alarmModelResourcePrefix = bgpPeerRemoteAddr
(1.3.6.1.2.1.15.3.1.7)
```

#### **4.1.5 Configurable Alarm Models**

The alarm model table SHOULD be initially populated by the system. The objects in alarmModelTable and ituAlarmTable have a MAX-ACCESS of read-create, which allows managers to modify the alarm models to suit their requirements.

#### **4.1.6 Active Alarm Management**

Lists of alarms currently active on an SNMP entity are stored in the alarmActiveTable and, optionally, a model specific alarmTable, e.g. the ituAlarmActiveTable.

#### **4.1.7 Distributed Alarm Management**

Distributed alarm management can be achieved by support of the Alarm MIB on both the alarm detection point and on the mid-level manager. This is facilitated by the ability to be able to store different named alarm lists. A mid-level manager could create an alarmListName for each of the devices it manages and therefore store separate lists for each device. In addition, the context and IP addresses of the alarm detection point are stored in the alarmActiveTable.

### **4.2 Definitions**

```
ALARM-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,
    Integer32, Unsigned32, Gauge32,
    TimeTicks, Counter32, Counter64,
    IpAddress, Opaque, mib-2,
    zeroDotZero                                FROM SNMPv2-SMI
    DateAndTime,
    RowStatus, RowPointer,
    TEXTUAL-CONVENTION                        FROM SNMPv2-TC
    SnmpAdminString                          FROM SNMP-FRAMEWORK-MIB
    InetAddressType, InetAddress            FROM INET-ADDRESS-MIB
    MODULE-COMPLIANCE, OBJECT-GROUP,
    NOTIFICATION-GROUP                      FROM SNMPv2-CONF
    ZeroBasedCounter32                      FROM RMON2-MIB;
```

```
alarmMIB MODULE-IDENTITY
```

```
    LAST-UPDATED "200402090000Z"
```

```
    ORGANIZATION "IETF Distributed Management Working Group"
```

```
    CONTACT-INFO
```

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#### DESCRIPTION

"The MIB module describes a generic solution to model alarms and to store the current list of active alarms.

Copyright (C) The Internet Society (2004). The initial version of this MIB module was published in RFC YYYY. For full legal notices see the RFC itself. Supplementary information may be available on:  
<http://www.ietf.org/copyrights/ianamib.html>"

-- RFC Ed.: replace yyyy with actual RFC number & remove  
-- this note

REVISION "200402090000Z"

#### DESCRIPTION

"Initial version, published as RFC yyyy."

-- RFC-Editor assigns yyyy

::= { mib-2 XX } -- to be assigned by IANA

alarmObjects OBJECT IDENTIFIER ::= { alarmMIB 1 }

alarmNotifications OBJECT IDENTIFIER ::= { alarmMIB 0 }

alarmModel OBJECT IDENTIFIER ::= { alarmObjects 1 }

alarmActive OBJECT IDENTIFIER ::= { alarmObjects 2 }

alarmClear OBJECT IDENTIFIER ::= { alarmObjects 3 }

-- Textual Conventions

-- ResourceId is intended to be a general textual convention

- that can be used outside of the set of MIBs related to
- Alarm Management.

ResourceId ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A unique identifier for this resource.

The type of the resource can be determined by looking at the OID that describes the resource.

Resources must be identified in a consistent manner. For example, if this resource is an interface, this object MUST point to an ifIndex and if this resource is a physical entity, then this MUST point to an entPhysicalDescr, given that entPhysicalIndex is not accessible. In general, the value is the name of the instance of the first accessible columnar object in the conceptual row of a table that is meaningful for this resource type, which SHOULD be defined in an IETF standard MIB."

SYNTAX OBJECT IDENTIFIER

-- LocalSnmpEngineOrZeroLenStr is intended to be a general  
-- textual convention that can be used outside of the set of  
-- MIBs related to Alarm Management.

LocalSnmpEngineOrZeroLenStr ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"An SNMP Engine ID or a zero-length string. The instantiation of this textual convention will provide guidance on when this will be an SNMP Engine ID and when it will be a zero lengths string"

SYNTAX OCTET STRING (SIZE(0 | 5..32))

-- Alarm Model

alarmModelLastChanged OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime at the time of the last creation, deletion or modification of an entry in the alarmModelTable.

If the number and content of entries has been unchanged since the last re-initialization of the local network management subsystem, then the value of this object MUST be zero."

```
::= { alarmModel 1 }
```

```
alarmModelTable OBJECT-TYPE
```



SYNTAX SEQUENCE OF AlarmModelEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table of information about possible alarms on the system,  
and how they have been modelled."

::= { alarmModel 2 }

alarmModelEntry OBJECT-TYPE

SYNTAX AlarmModelEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Entries appear in this table for each possible alarm state.  
This table MUST be persistent across system reboots."

INDEX { alarmListName, alarmModelIndex, alarmModelState }

::= { alarmModelTable 1 }

AlarmModelEntry ::= SEQUENCE {

alarmModelIndex	Unsigned32,
alarmModelState	Unsigned32,
alarmModelNotificationId	OBJECT IDENTIFIER,
alarmModelVarbindIndex	Unsigned32,
alarmModelVarbindValue	Integer32,
alarmModelDescription	SnmpAdminString,
alarmModelSpecificPointer	RowPointer,
alarmModelVarbindSubtree	OBJECT IDENTIFIER,
alarmModelResourcePrefix	OBJECT IDENTIFIER,
alarmModelRowStatus	RowStatus

}

alarmModelIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..4294967295)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An integer that acts as an alarm Id  
to uniquely identify each alarm  
within the named alarm list. "

::= { alarmModelEntry 1 }

alarmModelState OBJECT-TYPE

SYNTAX Unsigned32 (1..4294967295)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A value of 1 MUST indicate a clear alarm state."

The value of this object MUST be less than the alarmModelState of more severe alarm states for this alarm. The value of this object MUST be more than the alarmModelState of less severe alarm states

```
    for this alarm."
 ::= { alarmModelEntry 2 }
```

alarmModelNotificationId OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The NOTIFICATION-TYPE object identifier of this alarm state transition. If there is no notification associated with this alarm state, the value of this object MUST be '0.0'"

DEFVAL { zeroDotZero }

```
 ::= { alarmModelEntry 3 }
```

alarmModelVarbindIndex OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The index into the varbind listing of the notification indicated by alarmModelNotificationId which helps signal that the given alarm has changed state. If there is no applicable varbind, the value of this object MUST be zero.

Note that the value of alarmModelVarbindIndex acknowledges the existence of the first two obligatory varbinds in the InformRequest-PDU and SNMPv2-Trap-PDU (sysUpTime.0 and snmpTrapOID.0). That is, a value of 2 refers to the snmpTrapOID.0.

If the incoming notification is instead an SNMPv1 Trap-PDU, then an appropriate value for sysUpTime.0 or snmpTrapOID.0 shall be determined by using the rules in [section 3.1 of \[RFC3584\]](#)"

DEFVAL { 0 }

```
 ::= { alarmModelEntry 4 }
```

alarmModelVarbindValue OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value that the varbind indicated by alarmModelVarbindIndex takes to indicate that the alarm has entered this state.

If alarmModelVarbindIndex has a value of 0, so  
MUST alarmModelVarbindIndex.  
"  
DEFVAL { 0 }

```
::= { alarmModelEntry 5 }
```

alarmModelDescription OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"A brief description of this alarm and state suitable  
to display to operators."

DEFVAL { "" }

```
::= { alarmModelEntry 6 }
```

alarmModelSpecificPointer OBJECT-TYPE

SYNTAX RowPointer

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"If no additional, model-specific Alarm MIB is supported by  
the system the value of this object is `0.0'and attempts  
to set it to any other value MUST be rejected appropriately.

When a model-specific Alarm MIB is supported, this object  
MUST refer to the first accessible object in a corresponding  
row of the model definition in one of these model-specific  
MIB and attempts to set this object to { 0 0 } or any other  
value MUST be rejected appropriately."

DEFVAL { zeroDotZero }

```
::= { alarmModelEntry 7 }
```

alarmModelVarbindSubtree OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The name portion of each VarBind in the notification,  
in order, is compared to the value of this object.  
If the name is equal to or a subtree of the value  
of this object, for purposes of computing the value  
of AlarmActiveResourceID the 'prefix' will be the  
matching portion, and the 'indexes' will be any  
remainder. The examination of varbinds ends with  
the first match. If the value of this object is 0.0,  
then the first varbind, or in the case of v2, the  
first varbind after the timestamp and the trap  
OID, will always be matched.

"

DEFVAL { zeroDotZero }

```
::= { alarmModelEntry 8 }
```

alarmModelResourcePrefix OBJECT-TYPE  
SYNTAX OBJECT IDENTIFIER  
MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value of AlarmActiveResourceID is computed by appending any indexes extracted in accordance with the description of alarmModelVarbindSubtree onto the value of this object. If this object's value is 0.0, then the 'prefix' extracted is used instead.

"

DEFVAL { zeroDotZero }

::= { alarmModelEntry 9 }

alarmModelRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Control for creating and deleting entries. Entries may be modified while active. Alarms whose alarmModelRowStatus is not active will not appear in either the alarmActiveTable or the alarmClearTable. Setting this object to notInService cannot be used as an alarm suppression mechanism. Entries that are notInService will disappear as described in [RFC2579](#).

This row can not be modified while it is being referenced by a value of alarmActiveModelPointer. In these cases, an error of 'inconsistentValue' will be returned to the manager.

This entry may be deleted while it is being referenced by a value of alarmActiveModelPointer. This results in the deletion of this entry and entries in the active alarms referencing this entry via an alarmActiveModelPointer.

As all read-create objects in this table have a DEFVAL clause, there is no requirement that any object be explicitly set before this row can become active. Note that a row consisting only of default values is not very meaningful."

::= { alarmModelEntry 10 }

-- Active Alarm Table --

alarmActiveLastChanged OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

#### DESCRIPTION

"The value of sysUpTime at the time of the last creation or deletion of an entry in the alarmActiveTable.



If the number of entries has been unchanged since the last re-initialization of the local network management subsystem, then this object contains a zero value."

```
::= { alarmActive 1 }
```

#### alarmActiveOverflow OBJECT-TYPE

```
SYNTAX      Counter32
UNITS       "active alarms"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of active alarms that have not been put into
    the alarmActiveTable since system restart as a result
    of extreme resource constraints."
::= { alarmActive 5 }
```

#### alarmActiveTable OBJECT-TYPE

```
SYNTAX      SEQUENCE OF AlarmActiveEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A table of Active Alarms entries."
::= { alarmActive 2 }
```

#### alarmActiveEntry OBJECT-TYPE

```
SYNTAX      AlarmActiveEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Entries appear in this table when alarms are raised. They
    are removed when the alarm is cleared.

    If under extreme resource constraint the system is unable to
    add any more entries into this table, then the
    alarmActiveOverflow statistic will be increased by one."
INDEX       { alarmListName, alarmActiveDateAndTime,
              alarmActiveIndex }
::= { alarmActiveTable 1 }
```

#### AlarmActiveEntry ::= SEQUENCE {

alarmListName	SnmpAdminString,
alarmActiveDateAndTime	DateAndTime,
alarmActiveIndex	Unsigned32,
alarmActiveEngineID	LocalSnmpEngineOrZeroLenStr,
alarmActiveEngineAddressType	InetAddressType,
alarmActiveEngineAddress	InetAddress,
alarmActiveContextName	SnmpAdminString,
alarmActiveVariables	Unsigned32,

alarmActiveNotificationID	OBJECT IDENTIFIER,
alarmActiveResourceId	ResourceId,
alarmActiveDescription	SnmpAdminString,
alarmActiveLogPointer	RowPointer,

```
alarmActiveModelPointer      RowPointer,  
alarmActiveSpecificPointer  RowPointer }
```

alarmListName OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(0..32))

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The name of the list of alarms. This SHOULD be the same as nlmLogName if the Notification Log MIB [[RFC3014](#)] is supported. This SHOULD be the same as, or contain as a prefix, the applicable snmpNotifyFilterProfileName if the SNMP-NOTIFICATION-MIB DEFINITIONS [[RFC3413](#)] is supported.

An implementation may allow multiple named alarm lists, up to some implementation-specific limit (which may be none). A zero-length list name is reserved for creation and deletion by the managed system, and MUST be used as the default log name by systems that do not support named alarm lists."

::= { alarmActiveEntry 1 }

alarmActiveDateAndTime OBJECT-TYPE

SYNTAX DateAndTime

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The local date and time when the error occurred.

This object facilitates retrieving all instances of alarms that have been raised or have changed state since a given point in time.

Implementations MUST include the offset from UTC, if available. Implementation in environments in which the UTC offset is not available is NOT RECOMMENDED."

::= { alarmActiveEntry 2 }

alarmActiveIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..4294967295)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A strictly monotonically increasing integer which acts as the index of entries within the named alarm list. It wraps back to 1 after it reaches its maximum value."

::= { alarmActiveEntry 3 }

alarmActiveEngineID OBJECT-TYPE  
SYNTAX LocalSnmEngineOrZeroLenStr  
MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The identification of the SNMP engine at which the alarm originated. If the alarm is from an SNMPv1 system this object is a zero length string."

::= { alarmActiveEntry 4 }

alarmActiveEngineAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates what type of address is stored in the alarmActiveEngineAddress object - IPv4, IPv6, DNS, etc."

::= { alarmActiveEntry 5 }

alarmActiveEngineAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The address of the SNMP engine on which the alarm is occurring."

This object MUST always be instantiated, even if the list can contain alarms from only one engine."

::= { alarmActiveEntry 6 }

alarmActiveContextName OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(0..32))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The name of the SNMP MIB context from which the alarm came. For SNMPv1 alarms this is the community string from the Trap. Note that care MUST be taken when selecting community strings to ensure that these can be represented as a well-formed SnmpAdminString. Community or Context names that are not well-formed SnmpAdminStrings will be mapped to zero length strings."

If the alarm's source SNMP engine is known not to support multiple contexts, this object is a zero length string."

::= { alarmActiveEntry 7 }

alarmActiveVariables OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS        current

DESCRIPTION

"The number of variables in alarmActiveVariableTable for this  
alarm."

```
::= { alarmActiveEntry 8 }
```

alarmActiveNotificationID OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The NOTIFICATION-TYPE object identifier of the alarm state transition that is occurring."

```
::= { alarmActiveEntry 9 }
```

alarmActiveResourceId OBJECT-TYPE

SYNTAX ResourceId

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object identifies the resource under alarm."

If there is no corresponding resource, then the value of this object MUST be 0.0."

```
::= { alarmActiveEntry 10 }
```

alarmActiveDescription OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object provides a textual description of the active alarm. This text is generated dynamically by the notification generator to provide useful information to the human operator. This information SHOULD provide information allowing the operator to locate the resource for which this alarm is being generated. This information is not intended for consumption by automated tools."

```
::= { alarmActiveEntry 11 }
```

alarmActiveLogPointer OBJECT-TYPE

SYNTAX RowPointer

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A pointer to the corresponding row in a notification logging MIB where the state change notification for this active alarm is logged. If no log entry applies to this active alarm,

```
    then this object MUST have the value of 0.0"  
 ::= { alarmActiveEntry 12 }
```

alarmActiveModelPointer OBJECT-TYPE



SYNTAX        RowPointer

MAX-ACCESS read-only

STATUS        current

DESCRIPTION

"A pointer to the corresponding row in the alarmModelTable for this active alarm. This points not only to the alarm model being instantiated, but also to the specific alarm state that is active."

::= { alarmActiveEntry 13 }

alarmActiveSpecificPointer OBJECT-TYPE

SYNTAX        RowPointer

MAX-ACCESS read-only

STATUS        current

DESCRIPTION

"If no additional, model-specific, Alarm MIB is supported by the system this object is `0.0'. When a model-specific Alarm MIB is supported, this object is the instance pointer to the specific model-specific active alarm list."

::= { alarmActiveEntry 14 }

-- Active Alarm Variable Table --

alarmActiveVariableTable OBJECT-TYPE

SYNTAX        SEQUENCE OF AlarmActiveVariableEntry

MAX-ACCESS not-accessible

STATUS        current

DESCRIPTION

"A table of variables to go with active alarm entries."

::= { alarmActive 3 }

alarmActiveVariableEntry OBJECT-TYPE

SYNTAX        AlarmActiveVariableEntry

MAX-ACCESS not-accessible

STATUS        current

DESCRIPTION

"Entries appear in this table when there are variables in the varbind list of a corresponding alarm in alarmActiveTable.

Entries appear in this table as though the trap/notification had been transported using a SNMPv2-Trap-PDU, as defined in [[RFC3416](#)] - i.e, the alarmActiveVariableIndex 1 will always be sysUpTime and alarmActiveVariableIndex 2 will always be snmpTrapOID.

If the incoming notification is instead an SNMPv1 Trap-PDU and the value of alarmModelVarbindIndex is 1 or 2, an appropriate value for sysUpTime.0 or snmpTrapOID.0 shall be determined

by using the rules in [section 3.1 of \[RFC3584\]](#)."

```
INDEX { alarmListName, alarmActiveIndex,
        alarmActiveVariableIndex }
 ::= { alarmActiveVariableTable 1 }
```

```
AlarmActiveVariableEntry ::= SEQUENCE {
    alarmActiveVariableIndex      Unsigned32,
    alarmActiveVariableID         OBJECT IDENTIFIER,
    alarmActiveVariableValueType INTEGER,
    alarmActiveVariableCounter32Val Counter32,
    alarmActiveVariableUnsigned32Val Unsigned32,
    alarmActiveVariableTimeTicksVal TimeTicks,
    alarmActiveVariableInteger32Val Integer32,
    alarmActiveVariableOctetStringVal OCTET STRING,
    alarmActiveVariableIpAddressVal IpAddress,
    alarmActiveVariableOidVal     OBJECT IDENTIFIER,
    alarmActiveVariableCounter64Val Counter64,
    alarmActiveVariableOpaqueVal  Opaque }
```

```
alarmActiveVariableIndex OBJECT-TYPE
    SYNTAX      Unsigned32 (1..4294967295)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A strictly monotonically increasing integer, starting at
        1 for a given alarmActiveIndex, for indexing variables
        within the active alarm variable list. "
    ::= { alarmActiveVariableEntry 1 }
```

```
alarmActiveVariableID OBJECT-TYPE
    SYNTAX      OBJECT IDENTIFIER
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The alarm variable's object identifier."
    ::= { alarmActiveVariableEntry 2 }
```

```
alarmActiveVariableValueType OBJECT-TYPE
    SYNTAX      INTEGER {
        counter32(1),
        unsigned32(2),
        timeTicks(3),
        integer32(4),
        ipAddress(5),
        octetString(6),
        objectId(7),
        counter64(8),
        opaque(9)
    }
```

```
    }  
    MAX-ACCESS read-only  
    STATUS current  
    DESCRIPTION
```

"The type of the value. One and only one of the value objects that follow is used for a given row in this table, based on this type."

::= { alarmActiveVariableEntry 3 }

alarmActiveVariableCounter32Val OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value when alarmActiveVariableType is 'counter32'."

::= { alarmActiveVariableEntry 4 }

alarmActiveVariableUnsigned32Val OBJECT-TYPE

SYNTAX Unsigned32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value when alarmActiveVariableType is 'unsigned32'."

::= { alarmActiveVariableEntry 5 }

alarmActiveVariableTimeTicksVal OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value when alarmActiveVariableType is 'timeTicks'."

::= { alarmActiveVariableEntry 6 }

alarmActiveVariableInteger32Val OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value when alarmActiveVariableType is 'integer32'."

::= { alarmActiveVariableEntry 7 }

alarmActiveVariableOctetStringVal OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(0..65535))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value when alarmActiveVariableType is 'octetString'."

::= { alarmActiveVariableEntry 8 }

alarmActiveVariableIpAddressVal OBJECT-TYPE

SYNTAX IpAddress

MAX-ACCESS read-only

STATUS        current

DESCRIPTION

      "The value when alarmActiveVariableType is 'ipAddress'."  
      ::= { alarmActiveVariableEntry 9 }

```
alarmActiveVariableOidVal OBJECT-TYPE
    SYNTAX      OBJECT IDENTIFIER
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The value when alarmActiveVariableType is 'objectId'."
    ::= { alarmActiveVariableEntry 10 }

alarmActiveVariableCounter64Val OBJECT-TYPE
    SYNTAX      Counter64
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The value when alarmActiveVariableType is 'counter64'."
    ::= { alarmActiveVariableEntry 11 }

alarmActiveVariableOpaqueVal OBJECT-TYPE
    SYNTAX      Opaque (SIZE(0..65535))
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The value when alarmActiveVariableType is 'opaque'."

        Note that although RFC2578 [RFC2578] forbids the use
        of Opaque in 'standard' MIB modules, this particular
        usage is driven by the need to be able to accurately
        represent any well-formed notification, and justified
        by the need for backward compatibility."
    ::= { alarmActiveVariableEntry 12 }

-- Statistics --

alarmActiveStatsTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF AlarmActiveStatsEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "This table represents the alarm statistics
        information."
    ::= { alarmActive 4 }

alarmActiveStatsEntry OBJECT-TYPE
    SYNTAX      AlarmActiveStatsEntry
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "Statistics on the current active alarms."
```

```
INDEX    { alarmListName }  
  
::= {    alarmActiveStatsTable 1 }
```



AlarmActiveStatsEntry ::=

```
SEQUENCE {
    alarmActiveStatsActiveCurrent  Gauge32,
    alarmActiveStatsActives        ZeroBasedCounter32,
    alarmActiveStatsLastRaise      TimeTicks,
    alarmActiveStatsLastClear      TimeTicks
}
```

alarmActiveStatsActiveCurrent OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of currently active alarms on the system."

::= { alarmActiveStatsEntry 1 }

alarmActiveStatsActives OBJECT-TYPE

SYNTAX ZeroBasedCounter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of active alarms since system restarted."

::= { alarmActiveStatsEntry 2 }

alarmActiveStatsLastRaise OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime at the time of the last  
alarm raise for this alarm list.

If no alarm raises have occurred since the  
last re-initialization of the local network management  
subsystem, then this object contains a zero value."

::= { alarmActiveStatsEntry 3 }

alarmActiveStatsLastClear OBJECT-TYPE

SYNTAX TimeTicks

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime at the time of the last  
alarm clear for this alarm list."

If no alarm clears have occurred since the last re-initialization of the local network management subsystem, then this object contains a zero value."

```
::= { alarmActiveStatsEntry 4 }
```

```
-- Alarm Clear
```

```
alarmClearMaximum OBJECT-TYPE
```

```
SYNTAX Unsigned32
```

```
MAX-ACCESS read-write
```

```
STATUS current
```

```
DESCRIPTION
```

```
"This object specifies the maximum number of cleared
alarms to store in the alarmClearTable. When this
number is reached, the cleared alarms with the
earliest clear time will be removed from the table."
```

```
::= { alarmClear 1 }
```

```
alarmClearTable OBJECT-TYPE
```

```
SYNTAX SEQUENCE OF AlarmClearEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"This table contains information on
cleared alarms."
```

```
::= { alarmClear 2 }
```

```
alarmClearEntry OBJECT-TYPE
```

```
SYNTAX AlarmClearEntry
```

```
MAX-ACCESS not-accessible
```

```
STATUS current
```

```
DESCRIPTION
```

```
"Information on a cleared alarm."
```

```
INDEX { alarmListName, alarmClearDateAndTime,
alarmClearIndex }
```

```
::= { alarmClearTable 1 }
```

```
AlarmClearEntry ::=
```

```
SEQUENCE {
```

alarmClearIndex	Unsigned32,
alarmClearDateAndTime	DateAndTime,
alarmClearEngineID	LocalSnmpEngineOrZeroLenStr,
alarmClearEngineAddressType	InetAddressType,
alarmClearEngineAddress	InetAddress,
alarmClearContextName	SnmpAdminString,
alarmClearNotificationID	OBJECT IDENTIFIER,
alarmClearResourceId	ResourceId,
alarmClearLogIndex	Unsigned32,

```
alarmClearModelPointer      RowPointer  
}
```

## alarmClearIndex OBJECT-TYPE

SYNTAX Unsigned32 (1..4294967295)

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An integer which acts as the index of entries within the named alarm list. It wraps back to 1 after it reaches its maximum value.

This object has the same value as the alarmActiveIndex that this alarm instance had when it was active."

::= { alarmClearEntry 1 }

## alarmClearDateAndTime OBJECT-TYPE

SYNTAX DateAndTime

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"The local date and time when the alarm cleared.

This object facilitates retrieving all instances of alarms that have been cleared since a given point in time.

Implementations MUST include the offset from UTC, if available. Implementation in environments in which the UTC offset is not available is NOT RECOMMENDED."

::= { alarmClearEntry 2 }

## alarmClearEngineID OBJECT-TYPE

SYNTAX LocalSnmpEngineOrZeroLenStr

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The identification of the SNMP engine at which the alarm originated. If the alarm is from an SNMPv1 system this object is a zero length string."

::= { alarmClearEntry 3 }

## alarmClearEngineAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"This object indicates what type of address is stored in the alarmActiveEngineAddress object - IPv4, IPv6, DNS, etc."

::= { alarmClearEntry 4 }

## alarmClearEngineAddress OBJECT-TYPE

SYNTAX	InetAddress
MAX-ACCESS	read-only
STATUS	current
DESCRIPTION	

"The Address of the SNMP engine on which the alarm was occurring. This is used to identify the source of an SNMPv1 trap, since an alarmActiveEngineId cannot be extracted from the SNMPv1 trap PDU.

This object MUST always be instantiated, even if the list can contain alarms from only one engine."

::= { alarmClearEntry 5 }

alarmClearContextName OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(0..32))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The name of the SNMP MIB context from which the alarm came. For SNMPv1 traps this is the community string from the Trap. Note that care needs to be taken when selecting community strings to ensure that these can be represented as a well-formed SnmpAdminString. Community or Context names that are not well-formed SnmpAdminStrings will be mapped to zero length strings.

If the alarm's source SNMP engine is known not to support multiple contexts, this object is a zero length string."

::= { alarmClearEntry 6 }

alarmClearNotificationID OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The NOTIFICATION-TYPE object identifier of the alarm clear."

::= { alarmClearEntry 7 }

alarmClearResourceId OBJECT-TYPE

SYNTAX ResourceId

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object identifies the resource that was under alarm.

If there is no corresponding resource, then the value of this object MUST be 0.0."

::= { alarmClearEntry 8 }

alarmClearLogIndex OBJECT-TYPE

SYNTAX Unsigned32 (0..4294967295)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This number MUST be the same as the log index of the



applicable row in the notification log MIB, if it exists.  
If no log index applies to the trap, then this object  
MUST have the value of 0."  
 ::= { alarmClearEntry 9 }

alarmClearModelPointer OBJECT-TYPE

SYNTAX RowPointer

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A pointer to the corresponding row in the  
alarmModelTable for this cleared alarm."

::= { alarmClearEntry 10 }

-- Notifications

alarmActiveState NOTIFICATION-TYPE

OBJECTS { alarmActiveModelPointer,  
alarmActiveResourceId }

STATUS current

DESCRIPTION

"An instance of the alarm indicated by  
alarmActiveModelPointer has been raised  
against the entity indicated by  
alarmActiveResourceId."

The agent must throttle the generation of  
consecutive alarmActiveState traps so that there is at  
least a two-second gap between traps of this  
type against the same alarmActiveModelPointer and  
alarmActiveResourceId. When traps are throttled,  
they are dropped, not queued for sending at a future time.

A management application should periodically check  
the value of alarmActiveLastChanged to detect any  
missed alarmActiveState notification-events, e.g.,  
due to throttling or transmission loss."

::= { alarmNotifications 2 }

alarmClearState NOTIFICATION-TYPE

OBJECTS { alarmActiveModelPointer,  
alarmActiveResourceId }

STATUS current

DESCRIPTION

"An instance of the alarm indicated by  
alarmActiveModelPointer has been cleared against  
the entity indicated by alarmActiveResourceId."

The agent must throttle the generation of consecutive alarmActiveClear traps so that there is at least a two-second gap between traps of this

type against the same alarmActiveModelPointer and alarmActiveResourceId. When traps are throttled, they are dropped, not queued for sending at a future time.

A management application should periodically check the value of alarmActiveLastChanged to detect any missed alarmClearState notification-events, e.g., due to throttling or transmission loss."

```
::= { alarmNotifications 3 }
```

```
-- Conformance
```

```
alarmConformance OBJECT IDENTIFIER ::= { alarmMIB 2 }
```

```
alarmCompliances OBJECT IDENTIFIER ::= { alarmConformance 1 }
```

```
alarmCompliance MODULE-COMPLIANCE
```

```
    STATUS current
```

```
    DESCRIPTION
```

```
        "The compliance statement for systems supporting  
        the Alarm MIB."
```

```
    MODULE -- this module
```

```
        MANDATORY-GROUPS {
```

```
            alarmActiveGroup,  
            alarmModelGroup
```

```
        }
```

```
    GROUP alarmActiveStatsGroup
```

```
    DESCRIPTION
```

```
        "This group is optional."
```

```
    GROUP alarmClearGroup
```

```
    DESCRIPTION
```

```
        "This group is optional."
```

```
    GROUP alarmNotificationsGroup
```

```
    DESCRIPTION
```

```
        "This group is optional."
```

```
::= { alarmCompliances 1 }
```

```
alarmGroups OBJECT IDENTIFIER ::= { alarmConformance 2 }
```

```
alarmModelGroup OBJECT-GROUP
```

```
    OBJECTS {
```

```
        alarmModelLastChanged,  
        alarmModelNotificationId,  
        alarmModelVarbindIndex,  
        alarmModelVarbindValue,  
        alarmModelDescription,  
        alarmModelSpecificPointer,  
        alarmModelVarbindSubtree,
```

```
        alarmModelResourcePrefix,  
        alarmModelRowStatus  
    }  
    STATUS    current
```

## DESCRIPTION

"Alarm model group."  
::= { alarmGroups 1}

## alarmActiveGroup OBJECT-GROUP

OBJECTS {  
    alarmActiveLastChanged,  
    alarmActiveOverflow,  
    alarmActiveEngineID,  
    alarmActiveEngineAddressType,  
    alarmActiveEngineAddress,  
    alarmActiveContextName,  
    alarmActiveVariables,  
    alarmActiveNotificationID,  
    alarmActiveResourceId,  
    alarmActiveDescription,  
    alarmActiveLogPointer,  
    alarmActiveModelPointer,  
    alarmActiveSpecificPointer,  
    alarmActiveVariableID,  
    alarmActiveVariableValueType,  
    alarmActiveVariableCounter32Val,  
    alarmActiveVariableUnsigned32Val,  
    alarmActiveVariableTimeTicksVal,  
    alarmActiveVariableInteger32Val,  
    alarmActiveVariableOctetStringVal,  
    alarmActiveVariableIpAddressVal,  
    alarmActiveVariableOidVal,  
    alarmActiveVariableCounter64Val,  
    alarmActiveVariableOpaqueVal  
}

STATUS current

## DESCRIPTION

"Active Alarm list group."  
::= { alarmGroups 2}

## alarmActiveStatsGroup OBJECT-GROUP

OBJECTS {  
    alarmActiveStatsActives,  
    alarmActiveStatsActiveCurrent,  
    alarmActiveStatsLastRaise,  
    alarmActiveStatsLastClear  
}

STATUS current

## DESCRIPTION

"Active alarm summary group."  
::= { alarmGroups 3}

```
alarmClearGroup OBJECT-GROUP
    OBJECTS {
```

```

alarmClearMaximum,
alarmClearEngineID,
alarmClearEngineAddressType,
alarmClearEngineAddress,
alarmClearContextName,
alarmClearNotificationID,
alarmClearResourceId,
alarmClearLogIndex,
alarmClearModelPointer
    }
    STATUS      current
    DESCRIPTION
        "Cleared alarm group."
    ::= { alarmGroups 4}

alarmNotificationsGroup NOTIFICATION-GROUP
    NOTIFICATIONS { alarmActiveState, alarmClearState }
    STATUS      current
    DESCRIPTION
        "The collection of notifications that can be used to
        model alarms for faults lacking pre-existing
        notification definitions."
    ::= { alarmGroups 6 }

END

```

## 5. ITU Alarm

### 5.1 Overview

This MIB module defines alarm information specific to the alarm model defined in ITU M.3100 [[M.3100](#)], X.733[X.733] and X.736[X.736]. This MIB module follows the modular architecture defined by the Alarm MIB, in which the generic Alarm MIB can be augmented by other alarm information defined according to more specific models that define additional behaviour and characteristics.

The `ituAlarmTable` contains information from the ITU Alarm Model about possible alarms in the system.

The `ituAlarmActiveTable` contains information from the ITU Alarm Model about alarms modeled using the `ituAlarmTable` that are currently occurring on the system.

The `ituAlarmActiveStatsTable` provides statistics on current and total alarms.

### 5.2 IANA Considerations

Over time, there will be a need to add new IANAEventType and IANAItuProbableCause enumerated values. The Internet Assigned Number Authority (IANA) is responsible for the assignment of the



enumerations in these TCs.

IANAItuProbableCause value of 0 is reserved for special purposes and MUST NOT be assigned. Values of IANAItuProbableCause in the range 1 to 1023 are reserved for causes that correspond to ITU-T probable cause. All other requests for new causes will be handled on a first-come, with 1025.

Request should come in the form of well-formed SMI [[RFC2578](http://www.rfc2578.org)] for enumeration names that are unique and sufficiently descriptive.

While some effort will be taken to ensure that new enumerations do not conceptually duplicate existing enumerations it is acknowledged that the existence of conceptual duplicates in the starting probable cause list is an known industry reality.

To aid IANA in the administration of probable cause names and values, the OPS Area Director will appoint one or more experts to help review requests.

See <http://www.iana.org>

The following shall be used as the initial values, but the latest values for these textual conventions should be obtained from IANA:

IANA-ITU-ALARM-TC DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, mib-2 FROM SNMPv2-SMI  
TEXTUAL-CONVENTION FROM SNMPv2-TC;

ianaItuAlarmNumbers MODULE-IDENTITY

LAST-UPDATED "200402090000Z"

ORGANIZATION "IANA"

CONTACT-INFO

"Postal: Internet Assigned Numbers Authority  
Internet Corporation for Assigned Names  
and Numbers  
4676 Admiralty Way, Suite 330  
Marina del Rey, CA 90292-6601  
USA

Tel: +1 310-823-9358

E-Mail: [iana@iana.org](mailto:iana@iana.org)"

DESCRIPTION

"The MIB module defines the ITU Alarm  
textual convention for objects expected to require  
regular extension.

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itself. Supplementary information may be available on:  
<http://www.ietf.org/copyrights/ianamib.html>"

REVISION "200402090000Z"

DESCRIPTION

"Initial version, published as RFC yyyy."  
-- RFC-Editor assigns yyyy

::= { mib-2 XX } -- to be assigned by IANA

IANAItuProbableCause ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"ITU-T probable cause values. Duplicate values defined in X.733 are appended with X733 to ensure syntactic uniqueness. Probable cause value 0 is reserved for special purposes.

The Internet Assigned Number Authority (IANA) is responsible for the assignment of the enumerations in this TC. IANAItuProbableCause value of 0 is reserved for special purposes and MUST NOT be assigned.

Values of IANAItuProbableCause in the range 1 to 1023 are reserved for causes that correspond to ITU-T probable cause.

All other requests for new causes will be handled on a first-come, first served basis and will be assigned enumeration values starting with 1025.

Request should come in the form of well-formed SMI [[RFC2578](#)] for enumeration names that are unique and sufficiently descriptive.

While some effort will be taken to ensure that new probable causes do not conceptually duplicate existing probable causes it is acknowledged that the existence of conceptual duplicates in the starting probable cause list is an known industry reality.

To aid IANA in the administration of probable cause names and values, the OPS Area Director will appoint one or more experts to help review requests.

See <http://www.iana.org>"

REFERENCE

"ITU Recommendation M.3100, 'Generic Network Information Model', 1995

ITU Recommendation X.733, 'Information Technology - Open Systems Interconnection - System Management: Alarm Reporting Function', 1992

ITU Recommendation X.736, 'Information Technology - Open  
Systems Interconnection - System Management: Security  
Alarm Reporting Function', 1992"

SYNTAX            INTEGER

```
{
-- The following probable causes were defined in M.3100
aIS (1),
callSetUpFailure (2),
degradedSignal (3),
farEndReceiverFailure (4),
framingError (5),
lossOfFrame (6),
lossOfPointer (7),
lossOfSignal (8),
payloadTypeMismatch (9),
transmissionError (10),
remoteAlarmInterface (11),
excessiveBER (12),
pathTraceMismatch (13),
unavailable (14),
signalLabelMismatch (15),
lossOfMultiFrame (16),
receiveFailure (17),
transmitFailure (18),
modulationFailure (19),
demodulationFailure (20),
broadcastChannelFailure (21),
connectionEstablishmentError (22),
invalidMessageReceived (23),
localNodeTransmissionError (24),
remoteNodeTransmissionError (25),
routingFailure (26),
```

--Values 27-50 are reserved for communications alarm related

--probable causes

-- The following are used with equipment alarm.

```
backplaneFailure (51),
dataSetProblem (52),
equipmentIdentifierDuplication (53),
externalIFDeviceProblem (54),
lineCardProblem (55),
multiplexerProblem (56),
nEIdentifierDuplication (57),
powerProblem (58),
processorProblem (59),
protectionPathFailure (60),
receiverFailure (61),
replaceableUnitMissing (62),
replaceableUnitTypeMismatch (63),
synchronizationSourceMismatch (64),
```

terminalProblem (65),  
timingProblem (66),  
transmitterFailure (67),  
trunkCardProblem (68),

```
replaceableUnitProblem (69),
realTimeClockFailure (70),
--An equipment alarm to be issued if the system detects that the
--real time clock has failed
antennaFailure (71),
batteryChargingFailure (72),
diskFailure (73),
frequencyHoppingFailure (74),
iODeviceError (75),
lossOfSynchronisation (76),
lossOfRedundancy (77),
powerSupplyFailure (78),
signalQualityEvaluationFailure (79),
tranceiverFailure (80),
protectionMechanismFailure (81),
protectingResourceFailure (82),
-- Values 83-100 are reserved for equipment alarm related probable
-- causes
-- The following are used with environmental alarm.
airCompressorFailure (101),
airConditioningFailure (102),
airDryerFailure (103),
batteryDischarging (104),
batteryFailure (105),
commercialPowerFailure (106),
coolingFanFailure (107),
engineFailure (108),
fireDetectorFailure (109),
fuseFailure (110),
generatorFailure (111),
lowBatteryThreshold (112),
pumpFailure (113),
rectifierFailure (114),
rectifierHighVoltage (115),
rectifierLowFVoltage (116),
ventilationsSystemFailure (117),
enclosureDoorOpen (118),
explosiveGas (119),
fire (120),
flood (121),
highHumidity (122),
highTemperature (123),
highWind (124),
iceBuildUp (125),
intrusionDetection (126),
lowFuel (127),
lowHumidity (128),
lowCablePressure (129),
```

lowTemperatue (130),  
lowWater (131),  
smoke (132),  
toxicGas (133),



```
        coolingSystemFailure (134),
        externalEquipmentFailure (135),
        externalPointFailure (136),
-- Values 137-150 are reserved for environmental alarm related
-- probable causes
-- The following are used with Processing error alarm.
        storageCapacityProblem (151),
        memoryMismatch (152),
        corruptData (153),
        outOfCPUCycles (154),
        sfwrEnvironmentProblem (155),
        sfwrDownloadFailure (156),
        lossOfRealTime1 (157),
--A processing error alarm to be issued after the system has
--reinitialised. This will indicate
--to the management systems that the view they have of the managed
--system may no longer
--be valid. Usage example: The managed
--system issues this alarm after a reinitialization with severity
--warning to inform the
--management system about the event. No clearing notification will
--be sent.
        applicationSubsystemFailure (158),
        configurationOrCustomisationError (159),
        databaseInconsistency (160),
        fileError (161),
        outOfMemory (162),
        softwareError (163),
        timeoutExpired (164),
        underlayingResourceUnavailable (165),
        versionMismatch (166),
--Values 168-200 are reserved for processing error alarm related
-- probable causes.
        bandwidthReduced (201),
        congestion (202),
        excessiveErrorRate (203),
        excessiveResponseTime (204),
        excessiveRetransmissionRate (205),
        reducedLoggingCapability (206),
        systemResourcesOverload (207 ),
-- The following were defined X.733
        adapterError (500),
        applicationSubsystemFailure (501),
        bandwidthReducedX733 (502),
        callEstablishmentError (503),
        communicationsProtocolError (504),
        communicationsSubsystemFailure (505),
        configurationOrCustomizationError (506),
```

congestionX733 (507),  
corruptData (508),  
cpuCyclesLimitExceeded (509),  
dataSetOrModemError (510),

degradedSignalX733 (511),  
dteDceInterfaceError (512),  
enclosureDoorOpenX733 (513),  
equipmentMalfunction (514),  
excessiveVibration (515),  
fileErrorX733 (516),  
fireDetected (517),  
framingErrorX733 (518),  
heatingVentCoolingSystemProblem (519),  
humidityUnacceptable (520),  
inputOutputDeviceError (521),  
inputDeviceError (522),  
lanError (523),  
leakDetected (524),  
localNodeTransmissionErrorX733 (525),  
lossOfFrameX733 (526),  
lossOfSignalX733 (527),  
materialSupplyExhausted (528),  
multiplexerProblemX733 (529),  
outOfMemoryX733 (530),  
ouputDeviceError (531),  
performanceDegraded (532),  
powerProblems (533),  
pressureUnacceptable (534),  
processorProblems (535),  
pumpFailureX733 (536),  
queueSizeExceeded (537),  
receiveFailureX733 (538),  
receiverFailureX733 (539),  
remoteNodeTransmissionErrorX733 (540),  
resourceAtOrNearingCapacity (541),  
responseTimeExcessive (542),  
retransmissionRateExcessive (543),  
softwareErrorX733 (544),  
softwareProgramAbnormallyTerminated (545),  
softwareProgramError (546),  
storageCapacityProblemX733 (547),  
temperatureUnacceptable (548),  
thresholdCrossed (549),  
timingProblemX733 (550),  
toxicLeakDetected (551),  
transmitFailureX733 (552),  
transmitterFailure (553),  
underlyingResourceUnavailable (554),  
versionMismatchX733 (555),  
-- The following are defined in X.736  
authenticationFailure (600),  
breachOfConfidentiality (601),

cableTamper (602),  
delayedInformation (603),  
denialOfService (604),  
duplicateInformation (605),

```
informationMissing (606),
informationModificationDetected (607),
informationOutOfSequence (608),
keyExpired (609),
nonRepudiationFailure (610),
outOfHoursActivity (611),
outOfService (612),
proceduralError (613),
unauthorizedAccessAttempt (614),
unexpectedInformation (615),

other (1024)
}
```

IANAItuEventType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The ITU event Type values.

The Internet Assigned Number Authority (IANA) is responsible for the assignment of the enumerations in this TC.

Request should come in the form of well-formed SMI [[RFC2578](http://www.rfc2578.org)] for enumeration names that are unique and sufficiently descriptive.

See <http://www.iana.org> "

REFERENCE

"ITU Recommendation X.736, 'Information Technology - Open Systems Interconnection - System Management: Security Alarm Reporting Function', 1992"

SYNTAX

INTEGER

```
{
other (1),
communicationsAlarm (2),
qualityOfServiceAlarm (3),
processingErrorAlarm (4),
equipmentAlarm (5),
environmentalAlarm (6),
integrityViolation (7),
operationalViolation (8),
physicalViolation (9),
securityServiceOrMechanismViolation (10),
timeDomainViolation (11)
}
```

END



### 5.3 Textual Conventions

ITU-ALARM-TC DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, mib-2 FROM SNMPv2-SMI  
TEXTUAL-CONVENTION FROM SNMPv2-TC;

ituAlarmTc MODULE-IDENTITY

LAST-UPDATED "200402090000Z"

ORGANIZATION "IETF Distributed Management Working Group"

CONTACT-INFO

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DESCRIPTION

"This MIB module defines the ITU Alarm textual convention for objects not expected to require regular extension.

Copyright (C) The Internet Society (2004). The initial version of this MIB module was published in RFC YYYY. For full legal notices see the RFC itself. Supplementary information may be available on:

<http://www.ietf.org/copyrights/ianamib.html>"

-- RFC Ed.: replace yyyy with actual RFC number & remove

-- this note

REVISION "200402090000Z"

DESCRIPTION

"Initial version, published as RFC yyyy."

```
-- RFC-Editor assigns yyyy  
::= { mib-2 XX } -- to be assigned by IANA
```



ItuPerceivedSeverity ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"ITU perceived severity values"

REFERENCE

"ITU Recommendation M.3100, 'Generic Network Information Model', 1995

ITU Recommendation X.733, 'Information Technology - Open Systems Interconnection - System Management: Alarm Reporting Function', 1992"

SYNTAX INTEGER

```
{
cleared (1),
indeterminate (2),
critical (3),
major (4),
minor (5),
warning (6)
}
```

ItuTrendIndication ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"ITU trend indication values for alarms."

REFERENCE

"ITU Recommendation M.3100, 'Generic Network Information Model', 1995

ITU Recommendation X.733, 'Information Technology - Open Systems Interconnection - System Management: Alarm Reporting Function', 1992"

SYNTAX INTEGER

```
{
moreSevere (1),
noChange (2),
lessSevere (3)
}
```

END

## 5.4 Definitions

ITU-ALARM-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE,

Gauge32, mib-2

AutonomousType, RowPointer

FROM SNMPv2-SMI

FROM SNMPv2-TC

```
SnmpAdminString          FROM SNMP-FRAMEWORK-MIB
alarmListName, alarmModelIndex,
alarmActiveDateAndTime, alarmActiveIndex
                        FROM ALARM-MIB
```

ItuPerceivedSeverity,	
ItuTrendIndication	FROM ITU-ALARM-TC
IANAItuProbableCause,	
IANAItuEventType	FROM IANA-ITU-ALARM-TC
MODULE-COMPLIANCE, OBJECT-GROUP	FROM SNMPv2-CONF
ZeroBasedCounter32	FROM RMON2-MIB;

## ituAlarmMIB MODULE-IDENTITY

LAST-UPDATED "200402090000Z"

ORGANIZATION "IETF Distributed Management Working Group"

## CONTACT-INFO

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## DESCRIPTION

"The MIB module describes ITU Alarm information as defined in ITU Recommendation M.3100 [[M.3100](#)], X.733 [[X.733](#)] and X.736 [[X.736](#)].

Copyright (C) The Internet Society (2004). The initial version of this MIB module was published in RFC YYYY. For full legal notices see the RFC itself. Supplementary information may be available on: <http://www.ietf.org/copyrights/ianamib.html>"

-- RFC Ed.: replace yyyy with actual RFC number & remove  
 -- this note

REVISION "200402090000Z"

## DESCRIPTION

"Initial version, published as RFC yyyy."  
 -- RFC-Editor assigns yyyy

::= { mib-2 XX } -- to be assigned by IANA

ituAlarmObjects OBJECT IDENTIFIER ::= { ituAlarmMIB 1 }

ituAlarmModel OBJECT IDENTIFIER ::= { ituAlarmObjects 1 }

ituAlarmActive OBJECT IDENTIFIER ::= { ituAlarmObjects 2 }

ituAlarmTable OBJECT-TYPE

SYNTAX SEQUENCE OF ItuAlarmEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table of ITU Alarm information for possible alarms on the system."

::= { ituAlarmModel 1 }

ituAlarmEntry OBJECT-TYPE

SYNTAX ItuAlarmEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Entries appear in this table whenever an entry is created in the alarmModelTable with a value of alarmModelState in the range from 1 to 6. Entries disappear from this table whenever the corresponding entries are deleted from the alarmModelTable, including in cases where those entries have been deleted due to local system action. The value of alarmModelSpecificPointer has no effect on the creation or deletion of entries in this table. Values of alarmModelState map to values of ituAlarmPerceivedSeverity as follows:

alarmModelState	->	ituAlarmPerceivedSeverity
1	->	clear (1)
2	->	indeterminate (2)
3	->	warning (6)
4	->	minor (5)
5	->	major (4)
6	->	critical (3)

All other values of alarmModelState MUST NOT appear in this table.

This table MUST be persistent across system reboots."

INDEX { alarmListName, alarmModelIndex,  
ituAlarmPerceivedSeverity }

::= { ituAlarmTable 1 }

ItuAlarmEntry ::= SEQUENCE {

ituAlarmPerceivedSeverity ItuPerceivedSeverity,

ituAlarmEventType IANAItuEventType,

ituAlarmProbableCause	IANAItuProbableCause,
ituAlarmAdditionalText	SnmpAdminString,
ituAlarmGenericModel	RowPointer }

## ituAlarmPerceivedSeverity OBJECT-TYPE

SYNTAX ItuPerceivedSeverity

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"ITU perceived severity values."

## REFERENCE

"ITU Recommendation M.3100, 'Generic Network Information Model', 1995

ITU Recommendation X.733, 'Information Technology - Open Systems Interconnection - System Management: Alarm Reporting Function', 1992"

::= { ituAlarmEntry 1 }

## ituAlarmEventType OBJECT-TYPE

SYNTAX IANAItuEventType

MAX-ACCESS read-write

STATUS current

## DESCRIPTION

"Represents the event type values for the alarms"

## REFERENCE

"ITU Recommendation M.3100, 'Generic Network Information Model', 1995

ITU Recommendation X.733, 'Information Technology - Open Systems Interconnection - System Management: Alarm Reporting Function', 1992

ITU Recommendation X.736, 'Information Technology - Open Systems Interconnection - System Management: Security Alarm Reporting Function', 1992"

::= { ituAlarmEntry 2 }

## ituAlarmProbableCause OBJECT-TYPE

SYNTAX IANAItuProbableCause

MAX-ACCESS read-write

STATUS current

## DESCRIPTION

"ITU probable cause values."

## REFERENCE

"ITU Recommendation M.3100, 'Generic Network Information Model', 1995

ITU Recommendation X.733, 'Information Technology - Open Systems Interconnection - System Management: Alarm Reporting Function', 1992

ITU Recommendation X.736, 'Information Technology - Open Systems Interconnection - System Management: Security Alarm Reporting Function', 1992"

```
::= { ituAlarmEntry 3 }
```

ituAlarmAdditionalText OBJECT-TYPE



```
SYNTAX      SnmpAdminString
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "Represents the additional text field for the alarm."
REFERENCE
    "ITU Recommendation M.3100, 'Generic Network Information
    Model', 1995
    ITU Recommendation X.733, 'Information Technology - Open
    Systems Interconnection - System Management: Alarm
    Reporting Function', 1992"
::= { ituAlarmEntry 4}
```

ituAlarmGenericModel OBJECT-TYPE

```
SYNTAX      RowPointer
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object points to the corresponding
    row in the alarmModelTable for this alarm severity.

    This corresponding entry to alarmModelTable could also
    be derived by performing the reverse of the mapping
    from alarmModelState to ituAlarmPerceivedSeverity defined
    in the description of ituAlarmEntry to determine the
    appropriate { alarmListName, alarmModelIndex, alarmModelState }
    for this { alarmListName, alarmModelIndex,
    ituAlarmPerceivedSeverity }."
::= { ituAlarmEntry 5 }
```

-- ITU Active Alarm Table --

ituAlarmActiveTable OBJECT-TYPE

```
SYNTAX      SEQUENCE OF ItuAlarmActiveEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A table of ITU information for active alarms entries."
::= { ituAlarmActive 1 }
```

ituAlarmActiveEntry OBJECT-TYPE

```
SYNTAX      ItuAlarmActiveEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Entries appear in this table when alarms are active. They
    are removed when the alarm is no longer occurring."
INDEX      { alarmListName, alarmActiveDateAndTime,
```

```
        alarmActiveIndex }  
 ::= { ituAlarmActiveTable 1 }  
  
 ItuAlarmActiveEntry ::= SEQUENCE {
```

```
ituAlarmActiveTrendIndication      ItuTrendIndication,
ituAlarmActiveDetector             AutonomousType,
ituAlarmActiveServiceProvider      AutonomousType,
ituAlarmActiveServiceUser          AutonomousType
}
```

ituAlarmActiveTrendIndication OBJECT-TYPE

SYNTAX ItuTrendIndication

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Represents the trend indication values for the alarms."

REFERENCE

"ITU Recommendation M.3100, 'Generic Network Information Model', 1995

ITU Recommendation X.733, 'Information Technology - Open Systems Interconnection - System Management: Alarm Reporting Function', 1992"

::= { ituAlarmActiveEntry 1 }

ituAlarmActiveDetector OBJECT-TYPE

SYNTAX AutonomousType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Represents the SecurityAlarmDetector object."

REFERENCE

"ITU Recommendation X.736, 'Information Technology - Open Systems Interconnection - System Management: Security Alarm Reporting Function', 1992"

::= { ituAlarmActiveEntry 2 }

ituAlarmActiveServiceProvider OBJECT-TYPE

SYNTAX AutonomousType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Represents the ServiceProvider object."

REFERENCE

"ITU Recommendation X.736, 'Information Technology - Open Systems Interconnection - System Management: Security Alarm Reporting Function', 1992"

::= { ituAlarmActiveEntry 3 }

ituAlarmActiveServiceUser OBJECT-TYPE

SYNTAX AutonomousType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Represents the ServiceUser object."

REFERENCE

"ITU Recommendation X.736, 'Information Technology - Open

```

        Systems Interconnection - System Management: Security
        Alarm Reporting Function', 1992"
 ::= { ituAlarmActiveEntry 4 }

```

```
-- Statistics and Counters
```

```

ituAlarmActiveStatsTable OBJECT-TYPE
    SYNTAX SEQUENCE OF ItuAlarmActiveStatsEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table represents the ITU alarm statistics
        information."
 ::= { ituAlarmActive 2 }

```

```

ituAlarmActiveStatsEntry OBJECT-TYPE
    SYNTAX ItuAlarmActiveStatsEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Statistics on the current active ITU alarms."
    INDEX { alarmListName }

 ::= { ituAlarmActiveStatsTable 1 }

```

```

ItuAlarmActiveStatsEntry ::=
SEQUENCE {
    ituAlarmActiveStatsIndeterminateCurrent Gauge32,
    ituAlarmActiveStatsCriticalCurrent      Gauge32,
    ituAlarmActiveStatsMajorCurrent         Gauge32,
    ituAlarmActiveStatsMinorCurrent         Gauge32,
    ituAlarmActiveStatsWarningCurrent       Gauge32,
    ituAlarmActiveStatsIndeterminates       ZeroBasedCounter32,
    ituAlarmActiveStatsCriticals            ZeroBasedCounter32,
    ituAlarmActiveStatsMajors               ZeroBasedCounter32,
    ituAlarmActiveStatsMinors               ZeroBasedCounter32,
    ituAlarmActiveStatsWarnings             ZeroBasedCounter32
}

```

```

ituAlarmActiveStatsIndeterminateCurrent OBJECT-TYPE
    SYNTAX Gauge32
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "A count of the current number of active alarms with a

```

```
        ituAlarmPerceivedSeverity of indeterminate."  
 ::= { ituAlarmActiveStatsEntry 1 }
```

## ituAlarmActiveStatsCriticalCurrent OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A count of the current number of active alarms with a  
ituAlarmPerceivedSeverity of critical."

::= { ituAlarmActiveStatsEntry 2 }

## ituAlarmActiveStatsMajorCurrent OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A count of the current number of active alarms with a  
ituAlarmPerceivedSeverity of major."

::= { ituAlarmActiveStatsEntry 3 }

## ituAlarmActiveStatsMinorCurrent OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A count of the current number of active alarms with a  
ituAlarmPerceivedSeverity of minor."

::= { ituAlarmActiveStatsEntry 4 }

## ituAlarmActiveStatsWarningCurrent OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A count of the current number of active alarms with a  
ituAlarmPerceivedSeverity of warning."

::= { ituAlarmActiveStatsEntry 5 }

## ituAlarmActiveStatsIndeterminates OBJECT-TYPE

SYNTAX ZeroBasedCounter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"A count of the total number of active alarms with a  
ituAlarmPerceivedSeverity of indeterminate since system  
restart."

::= { ituAlarmActiveStatsEntry 6 }

## ituAlarmActiveStatsCriticals OBJECT-TYPE

SYNTAX ZeroBasedCounter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A count of the total number of active alarms with a



```
        ituAlarmPerceivedSeverity of critical since system restart."
 ::= { ituAlarmActiveStatsEntry 7 }
```

```
ituAlarmActiveStatsMajors OBJECT-TYPE
```

```
    SYNTAX      ZeroBasedCounter32
```

```
    MAX-ACCESS  read-only
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "A count of the total number of active alarms with a
         ituAlarmPerceivedSeverity of major since system restart."
```

```
 ::= { ituAlarmActiveStatsEntry 8 }
```

```
ituAlarmActiveStatsMinors OBJECT-TYPE
```

```
    SYNTAX      ZeroBasedCounter32
```

```
    MAX-ACCESS  read-only
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "A count of the total number of active alarms with a
         ituAlarmPerceivedSeverity of minor since system restart."
```

```
 ::= { ituAlarmActiveStatsEntry 9 }
```

```
ituAlarmActiveStatsWarnings OBJECT-TYPE
```

```
    SYNTAX      ZeroBasedCounter32
```

```
    MAX-ACCESS  read-only
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "A count of the total number of active alarms with a
         ituAlarmPerceivedSeverity of warning since system restart."
```

```
 ::= { ituAlarmActiveStatsEntry 10 }
```

```
-- Conformance
```

```
ituAlarmConformance OBJECT IDENTIFIER ::= { ituAlarmMIB 2 }
```

```
ituAlarmCompliances OBJECT IDENTIFIER ::= { ituAlarmConformance 1 }
```

```
ituAlarmCompliance MODULE-COMPLIANCE
```

```
    STATUS      current
```

```
    DESCRIPTION
```

```
        "The compliance statement for systems supporting
         the ITU Alarm MIB."
```

```
    MODULE -- this module
```

```
        MANDATORY-GROUPS {
```

```
            ituAlarmGroup
```

```
        }
```

```
    GROUP      ituAlarmServiceUserGroup
```

```
        DESCRIPTION
```

```
            "This group is optional."
```

```
    GROUP      ituAlarmSecurityGroup
```

DESCRIPTION	"This group is optional."
GROUP	ituAlarmStatisticsGroup
DESCRIPTION	

```
        "This group is optional."
 ::= { ituAlarmCompliances 1 }

ituAlarmGroups OBJECT IDENTIFIER ::= { ituAlarmConformance 2 }

ituAlarmGroup OBJECT-GROUP
OBJECTS {
    ituAlarmEventType,
    ituAlarmProbableCause,
    ituAlarmGenericModel
}
STATUS current
DESCRIPTION
    "ITU alarm details list group."
 ::= { ituAlarmGroups 1}

ituAlarmServiceUserGroup OBJECT-GROUP
OBJECTS {
    ituAlarmAdditionalText,
    ituAlarmActiveTrendIndication
}
STATUS current
DESCRIPTION
    "The use of these parameters is a service-user option."
 ::= { ituAlarmGroups 2 }

ituAlarmSecurityGroup OBJECT-GROUP
OBJECTS {
    ituAlarmActiveDetector,
    ituAlarmActiveServiceProvider,
    ituAlarmActiveServiceUser
}
STATUS current
DESCRIPTION
    "Security Alarm Reporting Function"
REFERENCE
    "ITU Recommendation X.736, 'Information Technology - Open
        Systems Interconnection - System Management: Security
        Alarm Reporting Function', 1992"
 ::= { ituAlarmGroups 3 }

ituAlarmStatisticsGroup OBJECT-GROUP
OBJECTS {
    ituAlarmActiveStatsIndeterminateCurrent,
    ituAlarmActiveStatsCriticalCurrent,
    ituAlarmActiveStatsMajorCurrent,
    ituAlarmActiveStatsMinorCurrent,
    ituAlarmActiveStatsWarningCurrent,
```

ituAlarmActiveStatsIndeterminates,  
ituAlarmActiveStatsCriticals,  
ituAlarmActiveStatsMajors,  
ituAlarmActiveStatsMinors,

```

        ituAlarmActiveStatsWarnings
    }
    STATUS current
    DESCRIPTION
        "ITU Active Alarm Statistics."
    ::= { ituAlarmGroups 4 }

END

```

## 6. Examples

### 6.1 Alarms Based on linkUp/linkDown Notifications

This example demonstrates an interface-based alarm that goes into a state of "warning" when a linkDown Notification [[RFC2863](#)] occurs but the ifAdminStatus indicates the interface was taken down administratively. If IfAdminStatus is "up" when the linkDown Notification occurs, then there is a problem, so the state of the alarm is critical. A linkUp alarm clears the alarm.

```

linkDown NOTIFICATION-TYPE
    OBJECTS { ifIndex, ifAdminStatus, ifOperStatus }
    STATUS current
    DESCRIPTION
        ""
    ::= { snmpTraps 3 }

```

```

linkUp NOTIFICATION-TYPE
    OBJECTS { ifIndex, ifAdminStatus, ifOperStatus }
    STATUS current
    DESCRIPTION
        ""
    ::= { snmpTraps 4 }

```

alarmModelIndex	3
alarmModelState	1
alarmModelNotificationId	linkUp
alarmModelVarbindIndex	0
alarmModelVarbindValue	0
alarmModelDescription	"linkUp"
alarmModelSpecificPointer	ituAlarmEntry.3.1
alarmModelVarbindSubtree	ifIndex (1.3.6.1.2.1.2.2.1.1)
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)
ituAlarmEventType	communicationsAlarm (2)
ituAlarmPerceivedSeverity	cleared (1)
ituAlarmGenericModel	alarmModelEntry.3.1

alarmModelIndex	3
alarmModelState	2
alarmModelNotificationId	linkDown

alarmModelVarbindIndex	2
alarmModelVarbindValue	down (2)
alarmModelDescription	"linkDown administratively"
alarmModelSpecificPointer	ituAlarmEntry.3.6
alarmModelVarbindSubtree	ifIndex (1.3.6.1.2.1.2.2.1.1)
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)
ituAlarmEventType	communicationsAlarm (2)
ituAlarmPerceivedSeverity	warning (6)
ituAlarmGenericModel	alarmModelEntry.3.2

alarmModelIndex	3
alarmModelState	3
alarmModelNotificationId	linkDown
alarmModelVarbindIndex	2
alarmModelVarbindValue	up (1)
alarmModelDescription	"linkDown - confirmed problem"
alarmModelSpecificPointer	ituAlarmEntry.3.3
alarmModelVarbindSubtree	ifIndex (1.3.6.1.2.1.2.2.1.1)
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)
ituAlarmEventType	communicationsAlarm (2)
ituAlarmPerceivedSeverity	critical (3)
ituAlarmGenericModel	alarmModelEntry.3.3

alarmActiveIndex	1
alarmActiveTime	2342464573
alarmActiveDateAndTime	DateAndTime,
alarmActiveEngineID	SnmpEngineID,
alarmActiveEngineAddressType	ipV4
alarmActiveEngineAddress	10.10.10.10
alarmActiveContextName	SnmpAdminString,
alarmActiveVariables	3
alarmActiveNotificationID	1.3.6.1.6.3.1.1.5.3
alarmActiveResourceId	1.3.6.1.2.1.2.2.1.1.346
alarmActiveLogPointer	0.0
alarmActiveModelPointer	alarmModelEntry.3.3
alarmActiveSpecificPointer	ituAlarmActiveEntry.1.3
ituAlarmActiveTrendIndication	moreSevere (1)
ituAlarmDetector	0.0
ituAlarmServiceProvider	0.0
ituAlarmServiceUser	0.0

alarmActiveVariableIndex	1
alarmActiveVariableID	sysUpTime.0
alarmActiveVariableValueType	timeTicks(3)
alarmActiveVariableCounter32Val	0

alarmActiveVariableUnsigned32Val	0
alarmActiveVariableTimeTicksVal	46754
alarmActiveVariableInteger32Val	0
alarmActiveVariableOctetStringVal	""



alarmActiveVariableIpAddressVal	0
alarmActiveVariableOidVal	0.0
alarmActiveVariableCounter64Val	0
alarmActiveVariableIndex	2
alarmActiveVariableID	snmpTrapOID.0
alarmActiveVariableValueType	objectId(7)
alarmActiveVariableCounter32Val	0
alarmActiveVariableUnsigned32Val	0
alarmActiveVariableTimeTicksVal	0
alarmActiveVariableInteger32Val	0
alarmActiveVariableOctetStringVal	""
alarmActiveVariableIpAddressVal	0
alarmActiveVariableOidVal	1.3.6.1.6.3.1.1.5.3
alarmActiveVariableCounter64Val	0
alarmActiveVariableIndex	3
alarmActiveVariableID	ifIndex
alarmActiveVariableValueType	integer32(4)
alarmActiveVariableCounter32Val	0
alarmActiveVariableUnsigned32Val	0
alarmActiveVariableTimeTicksVal	0
alarmActiveVariableInteger32Val	346
alarmActiveVariableOctetStringVal	""
alarmActiveVariableIpAddressVal	0
alarmActiveVariableOidVal	0.0
alarmActiveVariableCounter64Val	0
alarmActiveVariableIndex	4
alarmActiveVariableID	ifAdminStatus
alarmActiveVariableValueType	integer32(4)
alarmActiveVariableCounter32Val	0
alarmActiveVariableUnsigned32Val	0
alarmActiveVariableTimeTicksVal	0
alarmActiveVariableInteger32Val	up (1)
alarmActiveVariableOctetStringVal	""
alarmActiveVariableIpAddressVal	0
alarmActiveVariableOidVal	0.0
alarmActiveVariableCounter64Val	0
alarmActiveVariableIndex	5
alarmActiveVariableID	ifOperStatus
alarmActiveVariableValueType	integer32(4)
alarmActiveVariableCounter32Val	0
alarmActiveVariableUnsigned32Val	0
alarmActiveVariableTimeTicksVal	0
alarmActiveVariableInteger32Val	down(2)
alarmActiveVariableOctetStringVal	""
alarmActiveVariableIpAddressVal	0
alarmActiveVariableOidVal	0.0
alarmActiveVariableCounter64Val	0
alarmActiveVariableOpaqueVal	



## 6.2 Temperature Alarms Using Generic Notifications

Consider a system able to detect four different temperature states for a widget - normal, minor, major, critical. The system does not have any Notification definitions for these alarm states. A temperature alarm can be modelled using the generic alarm Notifications of alarmClearState and alarmActive.

alarmModelIndex	5
alarmModelState	1
alarmModelNotificationId	alarmClearState
alarmModelVarbindIndex	2
alarmModelVarbindValue	cleared (1)
alarmModelDescription	"Acme Widget Temperature Normal"
alarmModelSpecificPointer	ituAlarmEntry.5.1
alarmModelVarbindSubtree	alarmActiveResourceId
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)
ituAlarmEventType	environmentalAlarm (6)
ituPerceivedSeverity	cleared (1)
ituAlarmGenericModel	alarmModelEntry.5.1

alarmModelIndex	5
alarmModelState	2
alarmModelNotificationId	alarmActiveState
alarmModelVarbindIndex	2
alarmModelVarbindValue	minor (5)
alarmModelDescription	"Acme Widget Temperature Minor"
alarmModelSpecificPointer	ituAlarmEntry.5.5
alarmModelVarbindSubtree	alarmActiveResourceId
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)
ituAlarmEventState	environmentalAlarm (6)
ituPerceivedSeverity	minor (5)
ituAlarmGenericModel	alarmModelEntry.5.2

alarmModelIndex	5
alarmModelState	3
alarmModelNotificationId	alarmActiveState
alarmModelVarbindIndex	2
alarmModelVarbindValue	major (4)
alarmModelDescription	"Acme Widget Temperature Major"
alarmModelSpecificPointer	ituAlarmEntry.5.4
alarmModelVarbindSubtree	alarmActiveResourceId
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)

ituAlarmEventType	environmentalAlarm (6)
ituPerceivedSeverity	major (4)
ituAlarmGenericModel	alarmModelEntry.5.3

alarmModelIndex	5
alarmModelState	4
alarmModelNotificationId	alarmActiveState
alarmModelVarbindIndex	2
alarmModelVarbindValue	critical (3)
alarmModelDescription	"Acme Widget Temperature Critical"
alarmModelSpecificPointer	ituAlarmEntry.5.3
alarmModelVarbindSubtree	alarmActiveResourceId
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)
ituAlarmEventType	environmentalAlarm (6)
ituPerceivedSeverity	critical (3)
ituAlarmGenericModel	alarmModelEntry.5.4

### **6.3 Temperature Alarms Without Notifications**

Consider a system able to detect four different temperature states for a widget - normal, minor, major, critical. The system does not have any Notification definitions for these alarm states. A temperature alarm can be modelled without specifying any Notifications in the alarm model. When a temperature state other than normal is detected, an instance of this alarm would be added to the active alarm table, but no Notifications would be sent out.

This could alternatively be accomplished using the models from example 6.2 and by not specifying any target managers in the SNMP-TARGET-MIB, which would allow the alarm state Notifications to be logged in the Notification Log while still preventing Notifications from being transmitted on the wire.

alarmModelIndex	6
alarmModelState	1
alarmModelNotificationId	0.0
alarmModelVarbindIndex	0
alarmModelVarbindValue	0
alarmModelDescription	"Widget Temperature"
alarmModelSpecificPointer	ituAlarmEntry.6.1
alarmModelVarbindSubtree	0.0
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)
ituAlarmEventType	environmentalAlarm (6)
ituPerceivedSeverity	cleared (1)
ituAlarmGenericModel	alarmModelEntry.6.1

alarmModelIndex	6
alarmModelState	2
alarmModelNotificationId	0.0
alarmModelVarbindIndex	0

alarmModelVarbindValue	0
alarmModelDescription	"Widget Temperature"
alarmModelSpecificPointer	ituAlarmEntry.6.5
alarmModelVarbindSubtree	0.0
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)
ituAlarmEventState	environmentalAlarm (6)
ituAlarmPerceivedSeverity	minor (5)
ituAlarmGenericModel	alarmModelEntry.6.2
alarmModelIndex	6
alarmModelState	3
alarmModelNotificationId	0.0
alarmModelVarbindIndex	0
alarmModelVarbindValue	0
alarmModelDescription	"Widget Temperature"
alarmModelSpecificPointer	ituAlarmEntry.6.4
alarmModelVarbindSubtree	0.0
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)
ituAlarmEventType	environmentalAlarm (6)
ituPerceivedSeverity	major (4)
ituAlarmGenericModel	alarmModelEntry.6.3
alarmModelIndex	6
alarmModelState	4
alarmModelNotificationId	0.0
alarmModelVarbindIndex	0
alarmModelVarbindValue	0
alarmModelDescription	"Widget Temperature Severe"
alarmModelSpecificPointer	ituAlarmEntry.6.3
alarmModelVarbindSubtree	0.0
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)
ituAlarmEventType	environmentalAlarm (6)
ituPerceivedSeverity	critical (3)
ituAlarmGenericModel	alarmModelEntry.6.4

#### 6.4 Printer MIB Alarm Example

Consider the following Notifications defined in the printer MIB [[RFC1759](#)]:

```
prtAlertSeverityLevel OBJECT-TYPE
-- This value is a type 1 enumeration
SYNTAX      INTEGER {
```

```
other(1),  
critical(3),  
warning(4)
```



```

    }
MAX-ACCESS read-only
STATUS current
DESCRIPTION
    "The level of severity of this alert table entry. The printer
    determines the severity level assigned to each entry into the
    table."
 ::= { prtAlertEntry 2 }

printerV2Alert NOTIFICATION-TYPE
OBJECTS { prtAlertIndex, prtAlertSeverityLevel, prtAlertGroup,
          prtAlertGroupIndex, prtAlertLocation, prtAlertCode }
STATUS current
DESCRIPTION
    "This trap is sent whenever a critical event is added to the
    prtAlertTable."
 ::= { printerV2AlertPrefix 1 }

```

These Notifications can be used to model a printer alarm as follows:

alarmModelIndex	9
alarmModelState	1
alarmModelNotificationId	alarmClearState
alarmModelVarbindIndex	0
alarmModelVarbindValue	0
alarmModelDescription	"Printer Alarm"
alarmModelSpecificPointer	0.0
alarmModelVarbindSubtree	prtAlertGroup
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)

alarmModelIndex	9
alarmModelState	2
alarmModelNotificationId	printerV2Alert
alarmModelVarbindIndex	2
alarmModelVarbindValue	warning (4)
alarmModelDescription	"Printer Alarm"
alarmModelSpecificPointer	0.0
alarmModelVarbindSubtree	prtAlertGroup
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)

alarmModelIndex	9
alarmModelState	3
alarmModelNotificationId	printerV2Alert
alarmModelVarbindIndex	2
alarmModelVarbindValue	other (1)

alarmModelDescription	"Printer Alarm - unknown severity"
alarmModelSpecificPointer	0.0
alarmModelVarbindSubtree	prtAlertGroup
alarmModelResourcePrefix	0.0

alarmModelRowStatus	active (1)
alarmModelIndex	9
alarmModelState	4
alarmModelNotificationId	printerV2Alert
alarmModelVarbindIndex	2
alarmModelVarbindValue	critical (3)
alarmModelDescription	"Printer Alarm"
alarmModelSpecificPointer	0.0
alarmModelVarbindSubtree	priAlertGroup
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)

### 6.5 RMON Alarm Example

The RMON MIB [[RFC2819](#)] defines a mechanism for generating threshold alarms. When the thresholds are crossed, RisingAlarm and FallingAlarm Notifications are generated as appropriate. These Notifications can be used to model an upper threshold alarm as follows:

alarmModelIndex	6
alarmModelState	1
alarmModelNotificationId	FallingAlarm
alarmModelVarbindIndex	0
alarmModelVarbindValue	0
alarmModelDescription	"RMON Rising Clear Alarm"
alarmModelSpecificPointer	0.0
alarmModelVarbindSubtree	alarmIndex
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)

alarmModelIndex	6
alarmModelState	2
alarmModelNotificationId	RisingAlarm
alarmModelVarbindIndex	0
alarmModelVarbindValue	0
alarmModelDescription	"RMON Rising Alarm"
alarmModelSpecificPointer	0.0
alarmModelVarbindSubtree	alarmIndex
alarmModelResourcePrefix	0.0
alarmModelRowStatus	active (1)

### 6.6 The Lifetime of an Alarm

The following example demonstrates the relationship between

the active alarm table, the clear alarm table and the Notification Log MIB.

Consider a system with alarms modelled as in example 1 and which also supports the informational Notification dsx3LineStatusChange.

dsx3LineStatusChange NOTIFICATION-TYPE

OBJECTS { dsx3LineStatus,  
          dsx3LineStatusLastChange }

STATUS current

DESCRIPTION

"A dsx3LineStatusChange trap is sent when the value of an instance of dsx3LineStatus changes. It can be utilized by an NMS to trigger polls. When the line status change results in a lower level line status change (i.e. ds1), then no traps for the lower level are sent."

::= { ds3Traps 0 1 }

0. At system start, the active alarm table, alarm clear table and the Notification Log are all empty.

alarmActiveTable		nlmLogTable	
-----		-----	
alarmActiveIndex   alarm		nlmLogPointer   notif.	
-----		-----	

alarmClearTable	
-----	
alarmClear Index   alarm	
-----	



1. Some time later, a link goes down generating a linkDown Notification, which is sent out and logged in the Notification Log. As this Notification is modelled as an alarm state, an entry is added to the active alarm table.

alarmActiveTable	
-----	
alarmActiveIndex	alarm
-----	
1	link down - problem confirmed

nlmLogTable	
-----	
nlmLogPointer	Notification
-----	
1	linkdown

alarmClearTable	
-----	
alarmClear Index	alarm
-----	





2. Some time later, the value of an instance of dsx3LineStatus changes. This Notification is sent out and logged. As this is not modelled into an alarm state, the active alarm table remains unchanged.

alarmActiveTable	
-----	
alarmActiveIndex	alarm
-----	
1	linkDown - problem confirmed

nlmLogTable	
-----	
nlmLogPointer	Notification
-----	
1	linkDown
2	dsx3LineStatusChange

alarmClearTable	
-----	
alarmClear Index	alarm
-----	



3. Some time later, the link goes back up. A linkUp Notification is sent out and logged. As this Notification models the clear alarm for this alarm, the alarm entry is removed from the active alarm table. An entry is added to the clear alarm table.

alarmActiveTable	
-----	
alarmActiveIndex	alarm
-----	

nlmLogTable	
-----	
nlmLogPointer	Notification
-----	
1	linkDown
2	dsx3LineStatusChange
3	linkUp
-----	

alarmClearTable	
-----	
alarmClear Index	alarm
-----	
1	linkDown - confirmed problem
-----	

## 7. 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.

The following objects are defined with a MAX-ACCESS clause of read-write or read-create: alarmModelNotificationId, alarmModelVarbindIndex, alarmModelVarbindValue, alarmModelDescription, alarmModelSpecificPointer, alarmModelVarbindSubtree, alarmModelResourcePrefix, alarmModelRowStatus, alarmClearMaximum, ituAlarmEventType, ituAlarmProbableCause, ituAlarmAdditionalText, and

ituAlarmGenericModel.

Note that setting the value of alarmClearMaximum too low may result in security related alarms history being prematurely lost.

Changing values of alarmModelRowStatus as part of creating and deleting rows in the alarmModelTable result in adding new alarm models to the system or taking them out respectively. These operations need to be carefully planned. Adding a new model should be made in a consistent manner to avoid the system overflow with alarms. Taking out a model should result in the deletion of all this model's related alarms in the system.

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.

Note that the alarm throttling mechanism associated with the alarmActiveState and alarmActiveClear notifications only applies to a given alarm. Defining multiple alarms from the same internal stimulus may then still result in a flood of alarms into the network.

Although the use of community strings in SNMPv1 is not considered an effective means of providing security, security administrators SHOULD consider whether the fact that alarmActiveContextName can reveal community string values would make this object sensitive in their environment.

This MIB module can provide access to information that may also be accessed through manipulation of the SNMP-NOTIFICATION-MIB and the NOTIFICATION-LOG-MIB. This is expressed in part through the common indexing structure of nlmLogName [\[RFC3014\]](#), snmpNotifyFilterProfileName [\[RFC3413\]](#), and alarmListName. Consequently, it is RECOMMENDED that security administrators take care to configure a coherent VACM security policy. The objects alarmActiveLogPointer, alarmActiveModelPointer, alarmActiveSpecificPointer, and alarmClearModelPointer are object

identifiers that reference information to which a particular user might not be given direct access. The structure of these object identifiers does not permit the extraction of any sensitive information. Two other objects, alarmClearResourceId, and

alarmActiveResourceId, are also syntactically object identifiers, but their structure could provide a user with potentially useful information to which he or she might not otherwise be granted access, such as the existence of a particular resource.

For further discussion of security, see [section 3.4](#).

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## **9. Acknowledgements**

This document is a product of the DISMAN Working Group.

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## **11. References**

### **11.1 Normative References**

- [M.3100] ITU Recommendation M.3100, "Generic Network Information Model", 1995
- [RFC1157] Case, J., Fedor, M., Schoffstall, M., and J. Davin, "Simple Network Management Protocol", STD 15, [RFC 1157](#), May 1990.
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