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Entity MIB Extensions

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1. Introduction

This memo defines an experimental portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes managed objects used for managing multiple logical and physical entities managed by a single SNMP agent.

2. The SNMP Network Management Framework

The SNMP Network Management Framework presently consists of six major components. They are:

- o the overall architecture, described in [RFC 2271](#) [[RFC2271](#)].
- o the SMI, described in [RFC 1902](#) [[RFC1902](#)], - the mechanisms used for describing and naming objects for the purpose of management.
- o the MIB-II, STD 17, [RFC 1213](#) [[RFC1213](#)], - the core set of managed objects for the Internet suite of protocols.
- o the protocol, [RFC 1157](#) [[RFC1157](#)] and/or [RFC 1905](#) [[RFC1905](#)] and/or [RFC 2272](#) [[RFC2272](#)] -- the protocol for accessing managed information.
- o the user-based security model defined in [RFC 2274](#) [[RFC2274](#)].
- o the view-based access control model defined in [RFC 2275](#) [[RFC2275](#)].

Textual conventions are defined in [RFC 1903](#) [[RFC1903](#)], and conformance statements are defined in [RFC 1904](#) [[RFC1904](#)]. Common applications are defined in [RFC 2273](#) [[RFC2273](#)].

The Framework permits new objects to be defined for the purpose of experimentation and evaluation.

This memo specifies a MIB module that is compliant to the SNMPv2 SMI. A semantically identical MIB conforming to the SNMPv1 SMI can be produced through the appropriate translation.

2.1. Object Definitions

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the subset of Abstract Syntax Notation One (ASN.1) defined in the SMI. In particular, each object type is named by an OBJECT IDENTIFIER, an administratively assigned name. The object type together with an object instance serves to uniquely identify a specific instantiation of the object. For human convenience, we often use a textual string, termed the descriptor, to refer to the object type.

3. Overview

There is a need for a standardized way of providing non-volatile, administratively assigned identifiers for physical components represented with the Entity MIB [[RFC2037](#)]. There is also a need to align the Entity MIB with the SNMPv3 administrative framework [[RFC2271](#)].

This document defines extensions to the Entity MIB to address these needs.

4. Entity MIB Extensions

4.1. MIB Structure

The Entity Extensions MIB contains two group:

- Entity Physical Extensions Group
- Entity Logical Extensions Group

4.1.1. Entity Physical Extensions Group

This group contains a single table, called the entPhysicalXTable, which augments the entPhysicalTable. Each entPhysicalXEntry provides a writable string object, 'entPhysicalAlias', which can be used by an NMS as a non-volatile 'alias' (or label) for the physical component.

The entPhysicalAlias object is different from the ifAlias version in several ways:

- SnmpAdminString SYNTAX
The Interfaces MIB [[RFC2233](#)] version is defined as a DisplayString [[RFC1903](#)]. The Entity MIB [[RFC2037](#)] version is defined as an SnmpAdminString [[RFC2271](#)].
- SIZE (0..32)
The maximum length of the entPhysicalAlias string is half that of the ifAlias object.
- MIN-ACCESS read-only
Maintaining a non-volatile string for every physical component represented in the entPhysicalTable can be costly and unnecessary. An agent may choose to algorithmically generate entPhysicalAlias

strings for particular entries (based on the entPhysicalClass value).

4.1.2. Entity Logical Extensions Group

This group contains a single table, called the entLogicalXTable, which augments the entLogicalTable. Each entLogicalXEntry provides two read-only strings identifying the contextEngineID and contextName [[RFC2271](#)]. These strings can be used in SNMPv3 PDUs [[RFC2272](#)] to access management information held by the indicated SNMP agent, associated with each logical entity.

4.2. Definitions

```
ENTITY-EXTENSIONS-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY, OBJECT-TYPE
        FROM SNMPv2-SMI
    MODULE-COMPLIANCE, OBJECT-GROUP
        FROM SNMPv2-CONF
    SnmpEngineID, SnmpAdminString
        FROM SNMP-FRAMEWORK-MIB
    entityMIBObjects, entPhysicalEntry, entLogicalEntry,
    entityCompliances, entityGroups, entityPhysicalGroup
        FROM ENTITY-MIB;
```

```
entityXMIB MODULE-IDENTITY
    LAST-UPDATED "9803110000Z"
    ORGANIZATION "IETF Entity MIB Working Group"
    CONTACT-INFO
        "IETF Entity MIB WG Mailing List
        WG Subscribe:
            majordomo@cisco.com
            message body: subscribe entmib
        WG Discussion:
            entmib@cisco.com
        WG Archive:
            ftp://ftpeng.cisco.com/ftp/entmib/entmib
```

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DESCRIPTION

"The extension MIB module for physical entity information."
 ::= { experimental xx }

--

-- New Entity MIB Object Groups

--

entityPhysicalX OBJECT IDENTIFIER ::= { entityMIBObjects 5 }
 entityLogicalX OBJECT IDENTIFIER ::= { entityMIBObjects 6 }

-- *****

--

-- E N T I T Y P H Y S I C A L E X T E N S I O N S

--

-- *****

-- entPhysicalTable extensions

entPhysicalXTable OBJECT-TYPE

SYNTAX SEQUENCE OF EntPhysicalXEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains one row per physical element
 represented in the entPhysicalTable."

::= { entityPhysicalX 1 }

entPhysicalXEntry OBJECT-TYPE

SYNTAX EntPhysicalXEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"Information about a particular physical entity."

AUGMENTS { entPhysicalEntry }

::= { entPhysicalXTable 1 }


```
EntPhysicalXEntry ::= SEQUENCE {
    entPhysicalAlias      SnmpAdminString
}
```

```
entPhysicalAlias      OBJECT-TYPE
    SYNTAX      SnmpAdminString (SIZE (0..32))
    MAX-ACCESS   read-write
    STATUS      current
    DESCRIPTION
        "This object is an 'alias' name for the physical entity as
        specified by a network manager, and provides a non-volatile
        'handle' for the physical entity.
```

On the first instantiation of an physical entity, the value of entPhysicalAlias associated with that entity is set to the zero-length string. An agent may instead choose to set the value to a locally unique default value instead of a zero-length string.

If write access is implemented for an instance of entPhysicalAlias, and a value is written into the instance, the agent must retain the supplied value in the entPhysicalAlias instance associated with the same physical entity for as long as that entity remains instantiated, including across all re-initializations/reboots of the network management system, including those which result in a change of the physical entity's entPhysicalIndex value."

```
::= { entPhysicalXEntry 1 }
```

```
-- *****
--
--      E N T I T Y      L O G I C A L      E X T E N S I O N S
--
--      *****
```

```
-- entLogicalTable extensions
```

```
entLogicalXTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF EntLogicalXEntry
    MAX-ACCESS   not-accessible
    STATUS      current
    DESCRIPTION
        "This table contains one row per logical entity represented
        in the entLogicalTable."
    ::= { entityLogicalX 1 }
```



```
entLogicalXEntry      OBJECT-TYPE
    SYNTAX      EntLogicalXEntry
    MAX-ACCESS   not-accessible
    STATUS      current
    DESCRIPTION
        "Information about a particular logical entity."
    AUGMENTS    { entLogicalEntry }
    ::= { entLogicalXTable 1 }

EntLogicalXEntry ::= SEQUENCE {
    entLogicalContextEngineID      SnmpEngineID,
    entLogicalContextName          SnmpAdminString
}

entLogicalContextEngineID  OBJECT-TYPE
    SYNTAX      SnmpEngineID
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "The contextEngineID that can be used to send an SNMPv3
        message concerning information held by this logical entity,
        to the address specified by the associated
        'entLogicalTAddress/entLogicalTDomain' pair."
    ::= { entLogicalXEntry 1 }

entLogicalContextName     OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS   read-only
    STATUS      current
    DESCRIPTION
        "The contextName that can be used to send an SNMPv3 message
        concerning information held by this logical entity, to the
        address specified by the associated
        'entLogicalTAddress/entLogicalTDomain' pair."
    ::= { entLogicalXEntry 2 }

-- conformance information
-- compliance statements

entityPhysicalXCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "The compliance statement for SNMP entities which implement
        the Entity MIB PhysicalX Extensions."
    MODULE      -- this module
```



```
MANDATORY-GROUPS {
    entityPhysicalGroup,
    entityPhysicalXGroup
}

OBJECT entPhysicalAlias
MIN-ACCESS    read-only
DESCRIPTION
    "Write access is required if the associated
    entPhysicalClass value is equal to 'chassis(3)'.
    Otherwise, write access is not required."
::= { entityCompliances 2 }

entityLogicalXCompliance MODULE-COMPLIANCE
STATUS current
DESCRIPTION
    "The compliance statement for SNMP entities which implement
    the Entity MIB LogicalX Extensions.
MODULE -- this module
    MANDATORY-GROUPS {
        entityLogicalGroup,
        entityLogicalXGroup
    }
::= { entityCompliances 3 }

-- MIB groupings
entityPhysicalXGroup    OBJECT-GROUP
    OBJECTS {
        entPhysicalAlias
    }
    STATUS current
    DESCRIPTION
        "The collection of objects which are used to represent
        extended physical component information for which a single
        agent provides management information."
    ::= { entityGroups 6 }

entityLogicalXGroup    OBJECT-GROUP
    OBJECTS {
        entLogicalContextEngineID,
        entLogicalContextName,
    }
    STATUS current
    DESCRIPTION
```


"The collection of objects which are used to represent
extended logical entity information for which a single agent
provides management information."
::= { entityGroups 7 }

END

5. References

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[RFC2274]

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6. Security Considerations

No additional security concerns are introduced due to implementation of this MIB module. Refer to [RFC 2037](#) [[RFC2037](#)] for information on any security issues related to the Entity MIB.

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