

Network Working Group  
Internet Draft  
Obsoletes: [1565](#), [2248](#)

Ned Freed, Innosoft  
Steve Kille, ISODE Consortium  
<[draft-ietf-madman-netsm-mib-06.txt](#)>

## Network Services Monitoring MIB

December 1999

### Status of this Memo

This document is an Internet-Draft and is in full conformance with all provisions of [Section 10 of RFC 2026](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at <http://www.ietf.org/ietf/1id-abstracts.txt>

The list of Internet-Draft Shadow Directories can be accessed at <http://www.ietf.org/shadow.html>.

### Copyright Notice

Copyright (C) The Internet Society (1999). All Rights Reserved.

## **1. Introduction**

A networked application is a realization of some well-defined service on one or more host computers that is accessible via some network, uses some network for its internal operations, or both.

There are a wide range of networked applications for which it is appropriate to provide SNMP monitoring of their network usage. This includes applications using both TCP/IP and OSI networking. This document defines a MIB which contains the elements common to the monitoring of any network service application. This information includes a table of all monitorable network service applications, a count of the associations (connections) to each application, and basic information about the parameters and status of each application-related association.

This MIB may be used on its own for any application, and for most simple applications this will suffice. This MIB is also designed to serve as a building block which can be used in conjunction with application-specific monitoring and management. Two examples of this are MIBs defining additional variables for monitoring a Message Transfer Agent (MTA) service or a Directory Service Agent (DSA) service. It is expected that further MIBs of this nature will be specified.

This MIB does not attempt to provide facilities for management of the host or hosts the network service application runs on, nor does it provide facilities for monitoring applications that provide something other than a network service. Host resource and general application monitoring is handled by either the Host Resources MIB [[1](#)] or the application MIB [[2](#)].

## **[2. Table of Contents](#)**

<a href="#">1</a> Introduction .....	<a href="#">1</a>
<a href="#">2</a> Table of Contents .....	<a href="#">2</a>
<a href="#">3</a> The SNMP Network Management Framework .....	<a href="#">3</a>
<a href="#">4</a> Rationale for having a Network Services Monitoring MIB .....	<a href="#">4</a>
<a href="#">4.1</a> General Relationship to Other MIBs .....	<a href="#">4</a>
<a href="#">4.2</a> Restriction of Scope .....	<a href="#">4</a>
<a href="#">4.3</a> Configuration Information .....	<a href="#">5</a>
<a href="#">5</a> Application Objects .....	<a href="#">5</a>
<a href="#">6</a> Definitions .....	<a href="#">6</a>
<a href="#">7</a> Changes made since <a href="#">RFC 2248</a> .....	<a href="#">22</a>
<a href="#">8</a> Acknowledgements .....	<a href="#">22</a>
<a href="#">9</a> References .....	<a href="#">22</a>
<a href="#">10</a> Security Considerations .....	<a href="#">24</a>
<a href="#">11</a> Author and Chair Addresses .....	<a href="#">25</a>
<a href="#">12</a> Full Copyright Statement .....	<a href="#">25</a>

Expires June 2000

[Page 2]

### **3. The SNMP Network Management Framework**

The SNMP Management Framework presently consists of five major components:

- o An overall architecture, described in [RFC 2571](#) [3].
- o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIV1 and described in [RFC 1155](#) [4], [RFC 1212](#) [5] and [RFC 1215](#) [6]. The second version, called SMIV2, is described in [RFC 2578](#) [7], [RFC 2579](#) [8] and [RFC 2580](#) [9].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in [RFC 1157](#) [10]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in [RFC 1901](#) [11] and [RFC 1906](#) [12]. The third version of the message protocol is called SNMPv3 and described in [RFC 1906](#) [12], [RFC 2572](#) [13] and [RFC 2574](#) [14].
- o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in [RFC 1157](#) [10]. A second set of protocol operations and associated PDU formats is described in [RFC 1905](#) [15].
- o A set of fundamental applications described in [RFC 2573](#) [16] and the view-based access control mechanism described in [RFC 2575](#) [17].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the mechanisms defined in the SMI.

This memo specifies a MIB module that is compliant to the SMIV2. A MIB conforming to the SMIV1 can be produced through the appropriate translations. The resulting translated MIB must be semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine readable information in SMIV2 will be converted into textual descriptions in SMIV1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

Expires June 2000

[Page 3]

#### **4. Rationale for having a Network Services Monitoring MIB**

Much effort has been expended in developing tools to manage lower layer network facilities. However, relatively little work has been done on managing application layer entities. It is neither efficient nor reasonable to manage all aspects of application layer entities using only lower layer information. Moreover, the difficulty of managing application entities in this way increases dramatically as application entities become more complex.

This leads to a substantial need to monitor applications which provide network services, particularly distributed components such as MTAs and DSAs, by monitoring specific aspects of the application itself. Reasons to monitor such components include but are not limited to measuring load, detecting broken connectivity, isolating system failures, and locating congestion.

In order to manage network service applications effectively two requirements must be met:

- (1) It must be possible to monitor a large number of components (typical for a large organization).
- (2) Application monitoring must be integrated into general network management.

This specification defines simple read-only access; this is sufficient to determine up/down status and provide an indication of a broad class of operational problems.

##### **4.1. General Relationship to Other MIBs**

This MIB is intended to only provide facilities common to the monitoring of any network service application. It does not provide all the facilities necessary to monitor any specific application. Each specific type of network service application is expected to have a MIB of its own that makes use of these common facilities.

##### **4.2. Restriction of Scope**

The framework provided here is very minimal; there is a lot more that could be done. For example:

Expires June 2000

[Page 4]

- (1) General network service application configuration monitoring and control.
- (2) Detailed examination and modification of individual entries in service-specific request queues.
- (3) Probing to determine the status of a specific request (e.g., the location of a mail message with a specific message-id).
- (4) Requesting that certain actions be performed (e.g., forcing an immediate connection and transfer of pending messages to some specific system).

All these capabilities are both impressive and useful. However, these capabilities would require provisions for strict security checking. These capabilities would also mandate a much more complex design, with many characteristics likely to be fairly implementation-specific. As a result such facilities are likely to be both contentious and difficult to implement.

This document religiously keeps things simple and focuses on the basic monitoring aspect of managing applications providing network services. The goal here is to provide a framework which is simple, useful, and widely implementable.

### **4.3. Configuration Information**

This MIB attempts to provide information about the operational aspects of an application. Further information about the actual configuration of a given application may be kept in other places; the `applDirectoryName` or `applURL` may be used to point to places where such information is kept.

## **5. Application Objects**

This MIB defines a set of general purpose attributes which would be appropriate for a range of applications that provide network services. Both OSI and non-OSI services can be accommodated. Additional tables defined in extensions to this MIB provide attributes specific to specific network services.

A table is defined which will have one row for each operational network service application on the system. The only static information held on



Expires June 2000

[Page 5]

the application is its name. All other static information should be obtained from various directory services. The `applDirectoryName` is an external key, which allows an SNMP MIB entry to be cleanly related to the X.500 Directory. In SNMP terms, the applications are grouped in a table called `applTable`, which is indexed by an integer key `applIndex`.

The type of the application will be determined by one or both of:

- (1) Additional MIB variables specific to the applications.
- (2) An association to the application of a specific protocol.

## 6. Definitions

```
NETWORK-SERVICES-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    OBJECT-TYPE, Counter32, Gauge32, MODULE-IDENTITY, mib-2
    FROM SNMPv2-SMI
    TimeStamp, TEXTUAL-CONVENTION
    FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP
    FROM SNMPv2-CONF
    SnmpAdminString
    FROM SNMP-FRAMEWORK-MIB;
```

```
application MODULE-IDENTITY
```

```
    LAST-UPDATED "9912220000Z"
    ORGANIZATION "IETF Mail and Directory Management Working Group"
    CONTACT-INFO
        "      Ned Freed
```

```
        Postal: Innosoft International, Inc.
                1050 Lakes Drive
                West Covina, CA 91790
                US
```

```
        Tel: +1 626 919 3600
        Fax: +1 626 919 3614
```

```
        E-Mail: ned.freed@innosoft.com"
```

```
DESCRIPTION
```

```
    "The MIB module describing network service applications"
REVISION "9912220000Z"
```

Expires June 2000

[Page 6]

## DESCRIPTION

"This revision, published in RFC XXXX, changes a number of DisplayStrings to SnmpAdminStrings. Note that this change is not strictly supported by SMIV2. However, the alternative of deprecating the old objects and defining new objects would have a more adverse impact on backward compatibility and interoperability, given the particular semantics of these objects. The defining reference for distinguished names has also been updated from [RFC 1779](#) to [RFC 2253](#)."

REVISION "9905120000Z"

## DESCRIPTION

"This revision fixes a few small technical problems found in previous versions, mostly in regards to the conformance groups for different versions of this MIB. No changes have been made to the objects this MIB defines since [RFC 2248](#)."

REVISION "9708170000Z"

## DESCRIPTION

"This revision, published in [RFC 2248](#), adds the applDescription and applURL objects, adds the quiescing state to the applOperStatus object and renames the MIB from the APPLICATION-MIB to the NETWORK-SERVICE-MIB."

REVISION "9311280000Z"

## DESCRIPTION

"The original version of this MIB was published in [RFC 1565](#)"  
 ::= {mib-2 27}

-- Textual conventions

-- DistinguishedName is used to refer to objects in the  
-- directory.

DistinguishedName ::= TEXTUAL-CONVENTION

DISPLAY-HINT "255a"

STATUS current

## DESCRIPTION

"A Distinguished Name represented in accordance with [RFC 2253](#), presented in the UTF-8 charset defined in [RFC 2279](#)."

SYNTAX OCTET STRING (SIZE (0..255))

Expires June 2000

[Page 7]

-- Uniform Resource Locators are stored in URLStrings.

```
URLString ::= TEXTUAL-CONVENTION
    DISPLAY-HINT "255a"
    STATUS current
    DESCRIPTION
        "A Uniform Resource Locator represented in accordance
        with RFCs 1738 and 2368, presented in the NVT ASCII
        charset defined in RFC 854."
    SYNTAX OCTET STRING (SIZE (0..255))
```

-- The basic applTable contains a list of the application  
-- entities.

```
applTable OBJECT-TYPE
    SYNTAX SEQUENCE OF ApplEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "The table holding objects which apply to all different
        kinds of applications providing network services.
        Each network service application capable of being
        monitored should have a single entry in this table."
    ::= {application 1}
```

```
applEntry OBJECT-TYPE
    SYNTAX ApplEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry associated with a single network service
        application."
    INDEX {applIndex}
    ::= {applTable 1}
```

Expires June 2000

[Page 8]

```
ApplEntry ::= SEQUENCE {
    applIndex
        INTEGER,
    applName
        SnmpAdminString,
    applDirectoryName
        DistinguishedName,
    applVersion
        SnmpAdminString,
    applUptime
        TimeStamp,
    applOperStatus
        INTEGER,
    applLastChange
        TimeStamp,
    applInboundAssociations
        Gauge32,
    applOutboundAssociations
        Gauge32,
    applAccumulatedInboundAssociations
        Counter32,
    applAccumulatedOutboundAssociations
        Counter32,
    applLastInboundActivity
        TimeStamp,
    applLastOutboundActivity
        TimeStamp,
    applRejectedInboundAssociations
        Counter32,
    applFailedOutboundAssociations
        Counter32,
    applDescription
        SnmpAdminString,
    applURL
        URLString
}
```



Expires June 2000

[Page 9]

## applIndex OBJECT-TYPE

SYNTAX INTEGER (1..2147483647)

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An index to uniquely identify the network service application. This attribute is the index used for lexicographic ordering of the table."

::= {applEntry 1}

## applName OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The name the network service application chooses to be known by."

::= {applEntry 2}

## applDirectoryName OBJECT-TYPE

SYNTAX DistinguishedName

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The Distinguished Name of the directory entry where static information about this application is stored. An empty string indicates that no information about the application is available in the directory."

::= {applEntry 3}

## applVersion OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The version of network service application software. This field is usually defined by the vendor of the network service application software."

::= {applEntry 4}

Expires June 2000

[Page 10]

## applUptime OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The value of sysUpTime at the time the network service application was last initialized. If the application was last initialized prior to the last initialization of the network management subsystem, then this object contains a zero value."

::= {applEntry 5}

## applOperStatus OBJECT-TYPE

SYNTAX INTEGER {

up(1),

down(2),

halted(3),

congested(4),

restarting(5),

quiescing(6)

}

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"Indicates the operational status of the network service application. 'down' indicates that the network service is not available. 'up' indicates that the network service is operational and available. 'halted' indicates that the service is operational but not available. 'congested' indicates that the service is operational but no additional inbound associations can be accommodated. 'restarting' indicates that the service is currently unavailable but is in the process of restarting and will be available soon. 'quiescing' indicates that service is currently operational but is in the process of shutting down. Additional inbound associations may be rejected by applications in the 'quiescing' state."

::= {applEntry 6}

Expires June 2000

[Page 11]

## applLastChange OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The value of sysUpTime at the time the network service application entered its current operational state. If the current state was entered prior to the last initialization of the local network management subsystem, then this object contains a zero value."

::= {applEntry 7}

## applInboundAssociations OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of current associations to the network service application, where it is the responder. An inbound association occurs when another application successfully connects to this one."

::= {applEntry 8}

## applOutboundAssociations OBJECT-TYPE

SYNTAX Gauge32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The number of current associations to the network service application, where it is the initiator. An outbound association occurs when this application successfully connects to another one."

::= {applEntry 9}

## applAccumulatedInboundAssociations OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The total number of associations to the application entity since application initialization, where it was the responder."

::= {applEntry 10}

Expires June 2000

[Page 12]

**applAccumulatedOutboundAssociations OBJECT-TYPE**

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of associations to the application entity since application initialization, where it was the initiator."

::= {applEntry 11}

**applLastInboundActivity OBJECT-TYPE**

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime at the time this application last had an inbound association. If the last association occurred prior to the last initialization of the network subsystem, then this object contains a zero value."

::= {applEntry 12}

**applLastOutboundActivity OBJECT-TYPE**

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime at the time this application last had an outbound association. If the last association occurred prior to the last initialization of the network subsystem, then this object contains a zero value."

::= {applEntry 13}

**applRejectedInboundAssociations OBJECT-TYPE**

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of inbound associations the application entity has rejected, since application initialization. Rejected associations are not counted in the accumulated association totals. Note that this only counts associations the application entity has rejected itself; it does not count rejections that occur at lower layers of the network. Thus, this counter may not reflect the true number of failed inbound associations."

::= {applEntry 14}



Expires June 2000

[Page 13]

## applFailedOutboundAssociations OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number associations where the application entity is initiator and association establishment has failed, since application initialization. Failed associations are not counted in the accumulated association totals."

::= {applEntry 15}

## applDescription OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A text description of the application. This information is intended to identify and briefly describe the application in a status display."

::= {applEntry 16}

## applURL OBJECT-TYPE

SYNTAX URLString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"A URL pointing to a description of the application. This information is intended to identify and describe the application in a status display."

::= {applEntry 17}

-- The assocTable augments the information in the applTable  
-- with information about associations. Note that two levels  
-- of compliance are specified below, depending on whether  
-- association monitoring is mandated.

## assocTable OBJECT-TYPE

SYNTAX SEQUENCE OF AssocEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The table holding a set of all active application associations."

::= {application 2}

Expires June 2000

[Page 14]

## assocEntry OBJECT-TYPE

SYNTAX AssocEntry

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An entry associated with an association for a network service application."

INDEX {applIndex, assocIndex}

::= {assocTable 1}

AssocEntry ::= SEQUENCE {

assocIndex

INTEGER,

assocRemoteApplication

SnmpAdminString,

assocApplicationProtocol

OBJECT IDENTIFIER,

assocApplicationType

INTEGER,

assocDuration

TimeStamp

}

## assocIndex OBJECT-TYPE

SYNTAX INTEGER (1..2147483647)

MAX-ACCESS not-accessible

STATUS current

## DESCRIPTION

"An index to uniquely identify each association for a network service application. This attribute is the index that is used for lexicographic ordering of the table. Note that the table is also indexed by the applIndex."

::= {assocEntry 1}

Expires June 2000

[Page 15]

## assocRemoteApplication OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"The name of the system running remote network service application. For an IP-based application this should be either a domain name or IP address. For an OSI application it should be the string encoded distinguished name of the managed object. For X.400(1984) MTAs which do not have a Distinguished Name, the [RFC 2156](#) syntax 'mta in globalid' used in X400-Received: fields can be used. Note, however, that not all connections an MTA makes are necessarily to another MTA."

::= {assocEntry 2}

## assocApplicationProtocol OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-only

STATUS current

## DESCRIPTION

"An identification of the protocol being used for the application. For an OSI Application, this will be the Application Context. For Internet applications, the IANA maintains a registry of the OIDs which correspond to well-known applications. If the application protocol is not listed in the registry, an OID value of the form {applTCPProtoID port} or {applUDPPProtoID port} are used for TCP-based and UDP-based protocols, respectively. In either case 'port' corresponds to the primary port number being used by the protocol."

::= {assocEntry 3}

Expires June 2000

[Page 16]

assocApplicationType OBJECT-TYPE

```
SYNTAX INTEGER {
    uainitiator(1),
    uaresponder(2),
    peerinitiator(3),
    peerresponder(4)}
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This indicates whether the remote application is some type of client making use of this network service (e.g., a Mail User Agent) or a server acting as a peer. Also indicated is whether the remote end initiated an incoming connection to the network service or responded to an outgoing connection made by the local application. MTAs and messaging gateways are considered to be peers for the purposes of this variable."

::= {assocEntry 4}

assocDuration OBJECT-TYPE

```
SYNTAX TimeStamp
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of sysUpTime at the time this association was started. If this association started prior to the last initialization of the network subsystem, then this object contains a zero value."

::= {assocEntry 5}

-- Conformance information

applConformance OBJECT IDENTIFIER ::= {application 3}

applGroups OBJECT IDENTIFIER ::= {applConformance 1}

applCompliances OBJECT IDENTIFIER ::= {applConformance 2}



Expires June 2000

[Page 17]

-- Compliance statements

applCompliance MODULE-COMPLIANCE

STATUS obsolete

DESCRIPTION

"The compliance statement for [RFC 1565](#) implementations which support the Network Services Monitoring MIB for basic monitoring of network service applications. This is the basic compliance statement for [RFC 1565](#)."

MODULE

MANDATORY-GROUPS {applRFC1565Group}

::= {applCompliances 1}

assocCompliance MODULE-COMPLIANCE

STATUS obsolete

DESCRIPTION

"The compliance statement for [RFC 1565](#) implementations which support the Network Services Monitoring MIB for basic monitoring of network service applications and their associations."

MODULE

MANDATORY-GROUPS {applRFC1565Group, assocRFC1565Group}

::= {applCompliances 2}

applRFC2248Compliance MODULE-COMPLIANCE

STATUS deprecated

DESCRIPTION

"The compliance statement for [RFC 2248](#) implementations which support the Network Services Monitoring MIB for basic monitoring of network service applications."

MODULE

MANDATORY-GROUPS {applRFC2248Group}

::= {applCompliances 3}

assocRFC2248Compliance MODULE-COMPLIANCE

STATUS deprecated

DESCRIPTION

"The compliance statement for [RFC 2248](#) implementations which support the Network Services Monitoring MIB for basic monitoring of network service applications and their associations."

MODULE

MANDATORY-GROUPS {applRFC2248Group, assocRFC2248Group}

::= {applCompliances 4}

Expires June 2000

[Page 18]

## applRFCXXXXCompliance MODULE-COMPLIANCE

STATUS current

## DESCRIPTION

"The compliance statement for RFC XXXX implementations which support the Network Services Monitoring MIB for basic monitoring of network service applications."

## MODULE

MANDATORY-GROUPS {applRFCXXXXGroup}

::= {applCompliances 5}

## assocRFCXXXXCompliance MODULE-COMPLIANCE

STATUS current

## DESCRIPTION

"The compliance statement for RFC XXXX implementations which support the Network Services Monitoring MIB for basic monitoring of network service applications and their associations."

## MODULE

MANDATORY-GROUPS {applRFCXXXXGroup, assocRFCXXXXGroup}

::= {applCompliances 6}

-- Units of conformance

## applRFC1565Group OBJECT-GROUP

## OBJECTS {

applName, applVersion, applUptime, applOperStatus,  
applLastChange, applInboundAssociations,  
applOutboundAssociations, applAccumulatedInboundAssociations,  
applAccumulatedOutboundAssociations, applLastInboundActivity,  
applLastOutboundActivity, applRejectedInboundAssociations,  
applFailedOutboundAssociations}

STATUS obsolete

## DESCRIPTION

"A collection of objects providing basic monitoring of network service applications. This is the original set of such objects defined in [RFC 1565](#)."

::= {applGroups 7}

Expires June 2000

[Page 19]

## assocRFC1565Group OBJECT-GROUP

## OBJECTS {

assocRemoteApplication, assocApplicationProtocol,  
assocApplicationType, assocDuration}

STATUS obsolete

## DESCRIPTION

"A collection of objects providing basic monitoring of network service applications' associations. This is the original set of such objects defined in [RFC 1565](#)."

::= {applGroups 2}

## applRFC2248Group OBJECT-GROUP

## OBJECTS {

applName, applVersion, applUptime, applOperStatus,  
applLastChange, applInboundAssociations,  
applOutboundAssociations, applAccumulatedInboundAssociations,  
applAccumulatedOutboundAssociations, applLastInboundActivity,  
applLastOutboundActivity, applRejectedInboundAssociations,  
applFailedOutboundAssociations, applDescription, applURL}

STATUS deprecated

## DESCRIPTION

"A collection of objects providing basic monitoring of network service applications. This group was originally defined in [RFC 2248](#); note that applDirectoryName is missing."

::= {applGroups 3}

## assocRFC2248Group OBJECT-GROUP

## OBJECTS {

assocRemoteApplication, assocApplicationProtocol,  
assocApplicationType, assocDuration}

STATUS deprecated

## DESCRIPTION

"A collection of objects providing basic monitoring of network service applications' associations. This group was originally defined by [RFC 2248](#)."

::= {applGroups 4}

Expires June 2000

[Page 20]

## applRFCXXXXGroup OBJECT-GROUP

## OBJECTS {

applName, applDirectoryName, applVersion, applUptime,  
applOperStatus, applLastChange, applInboundAssociations,  
applOutboundAssociations, applAccumulatedInboundAssociations,  
applAccumulatedOutboundAssociations, applLastInboundActivity,  
applLastOutboundActivity, applRejectedInboundAssociations,  
applFailedOutboundAssociations, applDescription, applURL}

STATUS current

## DESCRIPTION

"A collection of objects providing basic monitoring of network service applications. This is the appropriate group for RFC XXXX -- it adds the applDirectoryName object missing in [RFC 2248](#)."

::= {applGroups 5}

## assocRFCXXXXGroup OBJECT-GROUP

## OBJECTS {

assocRemoteApplication, assocApplicationProtocol,  
assocApplicationType, assocDuration}

STATUS current

## DESCRIPTION

"A collection of objects providing basic monitoring of network service applications' associations. This is the appropriate group for RFC XXXX."

::= {applGroups 6}

-- OIDs of the form {applTCPProtoID port} are intended to be used  
-- for TCP-based protocols that don't have OIDs assigned by other  
-- means. {applUDPPProtoID port} serves the same purpose for  
-- UDP-based protocols. In either case 'port' corresponds to  
-- the primary port number being used by the protocol. For example,  
-- assuming no other OID is assigned for SMTP, an OID of  
-- {applTCPProtoID 25} could be used, since SMTP is a TCP-based  
-- protocol that uses port 25 as its primary port.

applTCPProtoID OBJECT IDENTIFIER ::= {application 4}

applUDPPProtoID OBJECT IDENTIFIER ::= {application 5}

END



Expires June 2000

[Page 21]

## 7. Changes made since [RFC 2248](#)

This revision corrects a few minor technical errors in the construction of the network services MIB in [RFC 2248](#) [22]. In addition, the `applName`, `applVersion`, and `applDescription` fields have been changed from `DisplayStrings` to `SnmpAdminStrings`. The reference to [RFC 1779](#) has also been updated to [RFC 2253](#), which in turn adds the ability for distinguished names to be in the UTF-8 character set.

## 8. Acknowledgements

This document is a product of the Mail and Directory Management (MADMAN) Working Group. It is based on an earlier MIB designed by S. Kille, T. Lenggenhager, D. Partain, and W. Yeong. The Electronic Mail Association's TSC committee was instrumental in providing feedback on and suggesting enhancements to [RFC 1565](#) [23] that have led to the present document.

## 9. References

- [1] Grillo, P. and Waldbusser, S., "Host Resources MIB", [RFC 1514](#), September 1993.
- [2] Krupczak, C. and Saperia, J., "Definitions of System-Level Managed Objects for Applications", [RFC 2287](#), February 1998.
- [3] Wijnen, B., Harrington, D., and Presuhn, R., "An Architecture for Describing SNMP Management Frameworks", [RFC 2571](#), April 1999.
- [4] Rose, M. and McCloghrie, K., "Structure and Identification of Management Information for TCP/IP-based Internets", [RFC 1155](#), May 1990.
- [5] Rose, M. and McCloghrie, K., "Concise MIB Definitions", [RFC 1212](#), March 1991.
- [6] Rose, M., "A Convention for Defining Traps for use with the SNMP", [RFC 1215](#), March 1991.

Expires June 2000

[Page 22]

- [7] McCloghrie, K., Perkins, D., and Schoenwaelder, J., "Structure of Management Information Version 2 (SMIV2)", [RFC 2578](#), April 1999.
- [8] McCloghrie, K., Perkins, D., and Schoenwaelder, J., "Textual Conventions for SMIV2", [RFC 2579](#), April 1999.
- [9] McCloghrie, K., Perkins, D., and Schoenwaelder, J., "Conformance Statements for SMIV2", [RFC 2580](#), April 1999.
- [10] Case, J., Fedor, M., Schoffstall, M., and Davin, J., "Simple Network Management Protocol", [RFC 1157](#), May 1990.
- [11] Case, J., McCloghrie, K., Rose, M., and Waldbusser, S., "Introduction to Community-based SNMPv2", [RFC 1901](#), January 1996.
- [12] Case, J., McCloghrie, K., Rose, M., and Waldbusser, S., "Transport Mappings for Version 2 of the Simple Network Management Protocol (SNMPv2)", [RFC 1906](#), January 1996.
- [13] Case, J., Harrington D., Presuhn R., and Wijnen, B., "Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)", [RFC 2572](#), April 1999.
- [14] Blumenthal, U. and Wijnen, B., "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", [RFC 2574](#), April 1999.
- [15] Case, J., McCloghrie, K., Rose, M., and Waldbusser, S., "Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)", [RFC 1905](#), January 1996.
- [16] Levi, D., Meyer, P., and Stewart, B., "SNMPv3 Applications", [RFC 2573](#), April 1999.
- [17] Wijnen, B., Presuhn, R., and K. McCloghrie, "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", [RFC 2575](#), April 1999.

Expires June 2000

[Page 23]

- [18] Wahl, M., Kille, S., Howes, T., "Lightweight Directory Access Protocol (v3): UTF-8 String Representation of Distinguished Names", [RFC 2253](#), December 1997.
- [19] Kille, S., "Mapping between X.400(1988) and [RFC 822](#)/MIME", [RFC 2156](#), January 1998.
- [20] Berners-Lee, T., Masinter, L., McCahill, M., "Uniform Resource Locators (URL)", [RFC 1738](#), December 1994.
- [21] Hoffman, P., Masinter, L., Zawinski, J, "The mailto URL Scheme", [RFC 2368](#), July 1998.
- [22] Freed, N. and Kille, S., "Network Services Monitoring MIB", [RFC 2248](#), January 1998.
- [23] Freed, N. and Kille, S., "Network Services Monitoring MIB", [RFC 1565](#), January 1994.
- [29] Postel, J. and Reynolds, J., "Telnet Protocol specification", [RFC 852](#), May 1983.

## **10. Security Considerations**

There are no management objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. So, if this MIB is implemented correctly, then there is no risk that an intruder can alter or create any management objects of this MIB via direct SNMP SET operations.

However, this MIB does provide passive information about the existence, type, and configuration of applications on a given host that could potentially indicate some sort of vulnerability. Finally, the information MIB provides about network usage could be used to analyze network traffic patterns.

SNMPv1 by itself is not a secure environment. 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.

It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC 2574](#) [[14](#)] and the View-based Access

Expires June 2000

[Page 24]

Control Model [RFC 2575](#) [[17](#)] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, 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.

## **11. Author and Chair Addresses**

Ned Freed  
Innosoft International, Inc.  
1050 Lakes Drive  
West Covina, CA 91790  
USA  
tel: +1 626 919 3600  
fax: +1 626 919 3614  
email: ned.freed@innosoft.com

Steve Kille, MADMAN WG Chair  
ISODE Consortium  
The Dome, The Square  
Richmond TW9 1DT  
UK  
tel: +44 181 332 9091  
email: S.Kille@isode.com

## **12. Full Copyright Statement**

Copyright (C) The Internet Society (1999). All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.



Expires June 2000

[Page 25]

The limited permissions granted above are perpetual and will not be revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.