Management Information Base
for version 2 of the
Simple Network Management Protocol (SNMPv2)

Status of this Memo

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

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1. Introduction

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

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

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

The management protocol, SNMPv2 [3], provides for the exchange of messages which convey management information between the agents and the management stations. It is the purpose of this document to define managed objects which describe the behavior of a SNMPv2 entity.

1.1. A Note on Terminology

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

SNMPv2-MIB DEFINITIONS ::= BEGIN

IMPORTS
   MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,
   ObjectName, Integer32, Counter32, snmpModules
   FROM SNMPv2-SMI
   TruthValue, DisplayString, TestAndIncr, TimeStamp
   FROM SNMPv2-TC
   MODULE-COMPLIANCE, OBJECT-GROUP
   FROM SNMPv2-CONF
   system, ifIndex, egpNeighAddr
   FROM RFC1213-MIB
   partyEntry
   FROM SNMPv2-PARTY-MIB;

snmpMIB MODULE-IDENTITY
   LAST-UPDATED "9304010000Z"
   ORGANIZATION "IETF SNMPv2 Working Group"
   CONTACT-INFO
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   DESCRIPTION
      "The MIB module for SNMPv2 entities."
   ::= { snmpModules 1 }

snmpMIBObjects OBJECT IDENTIFIER ::= { snmpMIB 1 }
-- the SNMPv2 statistics group
--
-- a collection of objects providing basic instrumentation of
-- the SNMPv2 entity.

-- A Case diagram[4] relating these objects is:
--
-- \v/ transport service
-- |--- snmpStatsPackets
-- |--- snmpStats30Something
-- |--- snmpStatsEncodingErrors
-- |--- snmpStatsUnknownDstParties
-- |--- snmpStatsDstPartyMismatches
-- |--- snmpStatsUnknownSrcParties
-- |--- snmpStatsBadAuths
-- |--- snmpStatsNotInLifetimes
-- |--- snmpStatsWrongDigestValues
-- |--- snmpStatsUnknownContexts
-- |--- snmpStatsBadOperations
-- |--- snmpStatsSilentDrops
-- |--- snmpStats

snmpStats OBJECT IDENTIFIER ::= { snmpMIBObjects 1 }
snmpStatsPackets OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION  "The total number of packets received by the
SNMPv2 entity from the transport service."
REFERENCE      "Derived from RFC1213-MIB.snmpInPkts."
::= { snmpStats 1 }

snmpStats30Something OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION  "The total number of packets which had an initial
octet with a value of 30 hexadecimal received by a
SNMPv2 entity which does not support SNMPv1.
(Such packets are possibly misdirected SNMPv1
Messages.)"
REFERENCE      "Derived from RFC1213-MIB.snmpInASNParseErrs."
::= { snmpStats 2 }

snmpStatsEncodingErrors OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION  "The total number of packets received by the
SNMPv2 entity which were improperly encoded or had
invalid syntax."
REFERENCE      "Derived from RFC1213-MIB.snmpInASNParseErrs."
::= { snmpStats 3 }
snmpStatsUnknownDstParties OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of SnmpPrivMsgs delivered to the SNMPv2 entity for which the privDst field was not a known local party."
::= { snmpStats 4 }

snmpStatsDstPartyMismatches OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of SnmpPrivMsgs delivered to the SNMPv2 entity which contained a SnmpAuthMsg for which the authData.dstParty field did not match the privDst field in the SnmpPrivMsg."
::= { snmpStats 5 }

snmpStatsUnknownSrcParties OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of SnmpAuthMsgs delivered to the SNMPv2 entity for which the authData.srcParty field was not a known remote party."
::= { snmpStats 6 }

snmpStatsBadAuths OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of SnmpAuthMsgs delivered to the SNMPv2 entity which contained an authInfo field which was inconsistent with the authentication protocol associated with the source party."
::= { snmpStats 7 }
snmpStatsNotInLifetimes OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The total number of SnmpAuthMsgs delivered to the
SNMPv2 entity which were deemed unauthentic due to
their authInfo.authSrcTimestamp field being less
than the source party’s clock plus lifetime."
 ::= { snmpStats 8 }

snmpStatsWrongDigestValues OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The total number of SnmpAuthMsgs delivered to the
SNMPv2 entity which were deemed unauthentic due to
their authInfo.authDigest field being unequal to
the expected digest value."
 ::= { snmpStats 9 }

snmpStatsUnknownContexts OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The total number of SnmpMgmtComs delivered to the
SNMPv2 entity for which the context field was not
a known SNMPv2 context."
 ::= { snmpStats 10 }

snmpStatsBadOperations OBJECT-TYPE
SYNTAX     Counter32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The total number of messages delivered to the
SNMPv2 entity which were silently dropped because
the PDU type referred to an operation not allowed
in the aclTable[5]."
 ::= { snmpStats 11 }
snmpStatsSilentDrops OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The total number of GetRequest-PDUs, 
GetNextRequest-PDUs, GetBulkRequest-PDUs, 
SetRequest-PDUs, and InformRequest-PDUs delivered 
to the SNMPv2 entity which were silently dropped 
because the size of an reply containing an 
alternate Response-PDU with an empty variable- 
bindings field was greater than either a local 
constraint or the maximum message size of the 
request’s source party."
 ::= { snmpStats 12 }
-- the SNMPv1 statistics group
--
-- a collection of objects providing basic instrumentation of
-- a SNMPv2 entity which also implements SNMPv1.

-- A Case diagram[4] relating these objects
-- (and those applicable objects in the snmpStats group)
-- is:
--    \v/  transport service
--     |
--     ===+== snmpStatsPackets
--     |
--     +==> snmpStatsEncodingErrors
--     |
--     +===> snmpV1BadCommunityNames
--     |
--     +===> snmpV1BadCommunityUses
--     |
--     ===== sink

snmpV1 OBJECT IDENTIFIER ::= { snmpMIBObjects 2 }

snmpV1BadCommunityNames OBJECT-TYPE
  SYNTAX     Counter32
  MAX-ACCESS read-only
  STATUS     current
  DESCRIPTION
    "The total number of SNMPv1 Messages delivered to
    the SNMPv2 entity which used a community name not
    known to the SNMPv2 entity."
  REFERENCE
    "Derived from RFC1213-MIB.snmpInBadCommunityNames."
  ::= { snmpV1 1 }
snmpV1BadCommunityUses OBJECT-TYPE
   SYNTAX     Counter32
   MAX-ACCESS read-only
   STATUS     current
   DESCRIPTION
       "The total number of SNMPv1 Messages delivered to
       SNMPv2 entity containing an operation which was
       not allowed for the community named in the
       Message."
   REFERENCE
       "Derived from RFC1213-MIB.snmpInBadCommunityUses."
 ::= { snmpV1 2 }
 -- the object resource group
--
-- a collection of objects allowing a SNMPv2 entity acting in
-- an agent role to describe its dynamically-configurable
-- object resources.

snmpOR     OBJECT IDENTIFIER ::= { snmpMIBObjects 3 }

snmpORLastChange OBJECT-TYPE
    SYNTAX     TimeStamp
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The value of sysUpTime at the time of the most
        recent change in state or value of any instance of
        snmpORID."
    ::= { snmpOR 1 }

snmpORTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF SnmpOREntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "The (conceptual) table listing the dynamically-
        configurable object resources in a SNMPv2 entity
        acting in an agent role.  SNMPv2 entities which do
        not support dynamically-configurable object
        resources will never have any instances of the
        columnar objects in this table."
    ::= { snmpORTable 1 }

snmpOREntry OBJECT-TYPE
    SYNTAX     SnmpOREntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "An entry (conceptual row) in the snmpORTable."
    INDEX      { snmpORIndex }
    ::= { snmpORTable 1 }
SnmpOREntry ::= SEQUENCE {
    snmpORIndex     Integer32,
    snmpORID        OBJECT IDENTIFIER,
    snmpORDescr     DisplayString
}

snmpORIndex OBJECT-TYPE
SYNTAX     Integer32
MAX-ACCESS not-accessible
STATUS     current
DESCRIPTION
"The auxiliary variable used for identifying
instances of the columnar objects in the
snmpORTable."
 ::= { snmpOREntry 1 }

snmpORID OBJECT-TYPE
SYNTAX     OBJECT IDENTIFIER
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"An authoritative identification of one of the
dynamically-configurable object resources in a
SNMPv2 entity acting in an agent role. This is
analogous to the sysObjectID object in MIB-II."
 ::= { snmpOREntry 2 }

snmpORDescr OBJECT-TYPE
SYNTAX     DisplayString
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"A textual description of one of the dynamically-
configurable object resources in a SNMPv2 entity
acting in an agent role. This is analogous to the
sysDescr object in MIB-II."
 ::= { snmpOREntry 3 }
the traps group

-- a collection of objects which allow the SNMPv2 entity, when
-- acting in an agent role, to be configured to generate
-- SNMPv2-Trap-PDUs.

snmpTrap OBJECT IDENTIFIER ::= { snmpMIBObjects 4 }

snmpTrapOID OBJECT-TYPE
SYNTAX OBJECT IDENTIFIER
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The authoritative identification of the trap
currently being sent. This variable occurs as the
second varbind of a SNMPv2-Trap-PDU."
::= { snmpTrap 1 }

snmpTrapTable OBJECT-TYPE
SYNTAX SEQUENCE OF SnmpTrapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A table which keeps track of how many traps have
been sent to each SNMPv2 entity."
::= { snmpTrap 2 }

SnmpTrapEntry OBJECT-TYPE
SYNTAX SnmpTrapEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"An entry which keeps track of how many traps have
been sent to a particular SNMPv2 entity."
AUGMENTS { partyEntry }
::= { snmpTrapTable 1 }

SnmpTrapEntry ::= SEQUENCE {
  snmpTrapNumbers Counter32
}


snmpTrapNumbers OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of traps which have been sent to a particular SNMPv2 party, since the last initialization of the SNMPv2 entity, or the creation of the SNMPv2 party, whichever occurred most recently."
 ::= { snmpTrapEntry 1 }

snmpTrapEnterprise OBJECT-TYPE
SYNTAX OBJECT IDENTIFIER
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The authoritative identification of the enterprise associated with the trap currently being sent. When a SNMPv2 proxy agent is mapping an RFC1157 Trap-PDU into a SNMPv2-Trap-PDU, this variable occurs as the last varbind."
 ::= { snmpTrap 3 }
snmpV2EnableAuthenTraps OBJECT-TYPE
   SYNTAX TruthValue
   MAX-ACCESS read-write
   STATUS current
   DESCRIPTION
   "Indicates whether the SNMPv2 entity, when acting in an agent role, is permitted to generate authenticationFailure traps. The value of this object overrides any configuration information; as such, it provides a means whereby all authenticationFailure traps may be disabled.

   Note that it is strongly recommended that this object be stored in non-volatile memory so that it remains constant between re-initializations of the network management system."

REFERENCE
"Derived from RFC1213-MIB.snmpEnableAuthenTraps."
::= { snmpTrap 4 }
-- well-known traps

snmpTraps OBJECT IDENTIFIER ::= { snmpMIBObjects 5 }

coldStart NOTIFICATION-TYPE
  STATUS current
  DESCRIPTION
  "A coldStart trap signifies that the SNMPv2 entity, acting in an agent role, is reinitializing itself such that its configuration may be altered."
  ::= { snmpTraps 1 }

warmStart NOTIFICATION-TYPE
  STATUS current
  DESCRIPTION
  "A warmStart trap signifies that the SNMPv2 entity, acting in an agent role, is reinitializing itself such that its configuration is unaltered."
  ::= { snmpTraps 2 }

linkDown NOTIFICATION-TYPE
  OBJECTS { ifIndex }
  STATUS current
  DESCRIPTION
  "A linkDown trap signifies that the SNMPv2 entity, acting in an agent role, recognizes a failure in one of the communication links represented in its configuration."
  ::= { snmpTraps 3 }

linkUp NOTIFICATION-TYPE
  OBJECTS { ifIndex }
  STATUS current
  DESCRIPTION
  "A linkUp trap signifies that the SNMPv2 entity, acting in an agent role, recognizes that one of the communication links represented in its configuration has come up."
  ::= { snmpTraps 4 }
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 snmpV2EnableAuthenTraps object indicates
whether this trap will be generated."
::= { snmpTraps 5 }

egpNeighborLoss NOTIFICATION-TYPE
OBJECTS { egpNeighAddr }
STATUS current
DESCRIPTION
"An egpNeighborLoss trap signifies that an EGP
neighbor has been marked down and the EGP peer
relationship no longer obtains."
::= { snmpTraps 6 }
-- the set group
--
-- a collection of objects which allow several cooperating
-- SNMPv2 entities, all acting in a manager role, to
-- coordinate their use of the SNMPv2 set operation.

snmpSet OBJECT IDENTIFIER ::= { snmpMIBObjects 6 }

snmpSetSerialNo OBJECT-TYPE
SYNTAX TestAndIncr
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"An advisory lock used to allow several
cooperating SNMPv2 entities, all acting in a
manager role, to coordinate their use of the
SNMPv2 set operation.

This object is used for coarse-grain coordination.
To achieve fine-grain coordination, one or more
similar objects might be defined within each MIB
group, as appropriate."
 ::= { snmpSet 1 }

-- conformance information

snmpMIBConformance
   OBJECT IDENTIFIER ::= { snmpMIB 2 }

snmpMIBCompliances
   OBJECT IDENTIFIER ::= { snmpMIBConformance 1 }

snmpMIBGroups
   OBJECT IDENTIFIER ::= { snmpMIBConformance 2 }

-- compliance statements

snmpMIBCompliance MODULE-COMPLIANCE
   STATUS current
   DESCRIPTION
      "The compliance statement for SNMPv2 entities
       which implement the SNMPv2 MIB."
   MODULE
      RFC1213-MIB
      MANDATORY-GROUPS { system }

   MODULE -- this module
      MANDATORY-GROUPS { snmpStatsGroup, snmpORGroup,
         snmpTrapGroup, snmpSetGroup }

   GROUP snmpV1Group
   DESCRIPTION
      "The snmpV1 group is mandatory only for those
       SNMPv2 entities which also implement SNMPv1."
   ::= { snmpMIBCompliances 1 }
snmpStatsGroup OBJECT-GROUP
  OBJECTS { snmpStatsPackets, snmpStats30Something, 
             snmpStatsEncodingErrors, 
             snmpStatsUnknownDstParties, 
             snmpStatsDstPartyMismatches, 
             snmpStatsUnknownSrcParties, snmpStatsBadAuths, 
             snmpStatsNotInLifetimes, 
             snmpStatsWrongDigestValues, 
             snmpStatsUnknownContexts, 
             snmpStatsBadOperations, 
             snmpStatsSilentDrops }
  STATUS  current
  DESCRIPTION
  "A collection of objects providing basic
   instrumentation of the SNMPv2 entity."
  ::= { snmpMIBGroups 1 }

snmpV1Group OBJECT-GROUP
  OBJECTS { snmpV1BadCommunityNames, snmpV1BadCommunityUses }
  STATUS  current
  DESCRIPTION
  "A collection of objects providing basic
   instrumentation of a SNMPv2 entity which also
   implements SNMPv1."
  ::= { snmpMIBGroups 2 }

snmpORGroup OBJECT-GROUP
  OBJECTS { snmpORLastChange, snmpORID, snmpORDescr }
  STATUS  current
  DESCRIPTION
  "A collection of objects allowing a SNMPv2 entity
   acting in an agent role to describe its
dynamically-configurable object resources."
  ::= { snmpMIBGroups 3 }
snmpTrapGroup OBJECT-GROUP
   OBJECTS { snmpTrapNumbers, snmpV2EnableAuthenTraps }
   STATUS current
   DESCRIPTION
       "A collection of objects which allow the SNMPv2 entity, when acting in an agent role, to be configured to generate SNMPv2-Trap-PDUs."
   ::= { snmpMIBGroups 4 }

snmpSetGroup OBJECT-GROUP
   OBJECTS { snmpSetSerialNo }
   STATUS current
   DESCRIPTION
       "A collection of objects which allow several cooperating SNMPv2 entities, all acting in a manager role, to coordinate their use of the SNMPv2 set operation."
   ::= { snmpMIBGroups 5 }

END
3. Acknowledgements

The objects in the snmpStats and snmpV1 groups are based, in part, on RFC 1213.

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4. References


5. Security Considerations

Security issues are not discussed in this memo.

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