                   Definitions of Managed Objects for
            the General Switch Management Protocol (GSMP)

Status of this Memo

   This document specifies an Internet standards track protocol for the
   Internet community, and requests discussion and suggestions for
   improvements. Please refer to the current edition of the "Internet
   Official Protocol Standards" (STD 1) for the standardization state
   and status of this protocol. Distribution of this memo is unlimited.

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Abstract

   This memo defines a portion of the Management Information Base (MIB)
   for the use with the network management protocols in the Internet
   community. In particular, it describes managed objects for the
   General Switch Management Protocol (GSMP).

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1. Introduction

   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 managed objects for the General Switch
   Management Protocol (GSMP).

   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].

2. The SNMP Management Framework

   The SNMP Management Framework presently consists of five major
   components:

   * An overall architecture, described in RFC 2571 [RFC2571].

   * 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 is described in
      STD 16, RFC 1155 [RFC1155], STD 16, RFC 1212 [RFC1212], and RFC
      1215 [RFC1215]. The second version, called SMIv2, is described in
      STD 58, RFC 2578 [RFC2578], RFC 2579 [RFC2579], and RFC
      2580[RFC2580].

   * Message protocols for transferring management information. The
      first version of the SNMP message protocol is called SNMPv1 and is
      described in STD 15, RFC 1157 [RFC1157]. A second version of the
      SNMP message protocol, which is not an Internet standards track
      protocol, is called SNMPv2c and is described in RFC 1901 [RFC1901]
      and RFC 1906 [RFC1906]. The third version of the message protocol
      is called SNMPv3 and is described in RFC 1906 [RFC1906], RFC 2572
      [RFC2572], and RFC 2574 [RFC2574].

   * Protocol operations for accessing management information. The
      first set of protocol operations and associated PDU formats are
      described in STD 15, RFC 1157 [RFC1157]. A second set of
      operations and associated PDU formats are described in 1905
      [RFC1905].

*   A set of fundamental applications described in RFC 2573 [RFC2573],
    and the view-based access control mechanism is described in RFC
    2575 [RFC2575].

A more detailed introduction to the current SNMP Management Framework
can be found in RFC 2570 [RFC2570].

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.

3. Structure of the MIB

This memo defines a portion of the Management Information Base (MIB)
for the use with network management protocols in the Internet
community. In particular, it describes managed objects for the
General Switch Management Protocol (GSMP), as defined in [RFC3292].

3.1 Overview

The General Switch Management Protocol (GSMP) is a general purpose
protocol to control a label switch. GSMP allows a controller to
establish and release connections across the switch, to manage switch
ports and to request configuration information or statistics. It
also allows the switch to inform the controller of asynchronous
events such as a link going down.

The GSMP protocol is asymmetric, the controller being the master and
the switch being the slave. Multiple switches may be controlled by a
single controller using multiple instantiations of the protocol over
separate control connections. Also a switch may be controlled by
more than one controller by using the technique of partitioning.

Each instance of a (switch controller, switch partition) adjacency is
a session between one switch controller entity and one switch entity.
The MIB provides objects to configure/setup these entities to form
the GSMP sessions. It also provide objects to monitor these GSMP
sessions.

3.2 Scope

The GSMP mib is a protocol mib. It contains objects to configure, monitor, and maintain the GSMP protocol entity. It does not provide any information learned via the protocol, such as "all ports config" information.

The relationships between virtual entities, such as Virtual Switch Entities, and "physical" entities, such as Switch Entities, falls outside of the management of GSMP. This also applies for the management of switch partitions. So this is excluded from the GSMP mib.

It is possible to configure which, and how many Switch Controllers are controlling one Switch since every potential session with the switch has to be represented with an Switch entity. It is, however, not possible to define that one Switch Controller shouldn't allow other Switch controllers to control the same switch or partition on the switch. It is assumed that there are mechanisms that synchronise controllers and the configuration of them. This is outside the scope of this mib.

3.3 MIB guideline

Two tables are used to configure potential GSMP sessions depending if you are acting as a GSMP switch controller or a GSMP switch. Each row in these tables initiates a GSMP session.

The entity ID is a 48-bit name that is unique within the operational context of the device. A 48-bit IEEE 802 MAC address, if available, MAY be used for the entity ID. If the Ethernet encapsulation is used, the entity ID MUST be the IEEE 802 MAC address of the interface on which the GSMP session is to be setup.

First, the encapsulation of the potential GSMP session shall be defined. If ATM is used, a row in the gsmpAtmEncapTable has to be created with the index set to the entity ID. The specified resources should be allocated to GSMP. If TCP/IP is used, a row in the gsmpTcpIpEncapTable has to be created with the index set to the entity ID. The specified port shall be allocated to GSMP. No special action is needed if ethernet encapsulation is used.

Then the entity information shall be defined. To create a Switch Entity, an entry in the gsmpSwitchTable is created with the index set to the entity ID. To create a Switch Controller Entity, an entry in the gsmpControllerTable is created with the index set to the entity ID.

When the row status of the GsmpControllerEntry or GsmpSwitchEntry is
set to active (e.g., in the case with ATM or TCP/IP there are active
rows with a corresponding entity ID), the adjacency protocol of GSMP
is started.

Another table, the gsmpSessionTable, shows the actual sessions that
are established or are in the process of being established. Each row
represents a specific session between an Entity and a peer. This
table carries information about the peer, the session, and parameters
that were negotiated by the adjacency procedures. The
gsmpSessionTable also contains statistical information regarding the
session.

This creation order SHOULD be used by all GSMP managers. This is to
avoid clash situations in multiple SNMP manager scenarios where
different managers may create competing entries in the different
tables.

Entities may very well be configured by other means than SNMP, e.g.,
the cli command. Such configured entities SHOULD be represented as
entries in the tables of this mib and SHOULD be possible to query,
and MAY be possible to alter with SNMP.

3.4 MIB groups

3.4.1 GSMP Switch Controller group

The controller group is used to configure a potential GSMP session on
a Switch Controller. A row in the gsmpControllerTable is created for
each such session. If ATM or TCP/IP encapsulation is used, a
corresponding row has to be created in these tables before the
session adjacency protocol is initiated.

If ATM or TCP/IP is used, encapsulation data is defined in the
corresponding encapsulation tables. If ethernet is used, the MAC
address of the interface defined for the session is set by the
Controller ID object.

The adjacency parameters are defined; such as

- Max supported GSMP version.
- Time between the periodic adjacency messages.
- Controller local port number and instance number.
- Whether partitions are being used and the partition ID for the
  specific partitions this controller is concerned with if
  partitions are used.
- The resynchronisation strategy for the session is specified.

The notification mapping is set to specify for with events the
corresponding SNMP notifications are sent.

3.4.2 GSMP Switch group

The switch group is used to configure a potential GSMP session on a
Switch. A row in the gsmpSwitchTable is created for each such
session. If ATM or TCP/IP encapsulation is used, a corresponding row
has to be created in these tables before the session adjacency
protocol is initiated.

If ATM or TCP/IP is used, encapsulation data is defined in the
corresponding encapsulation tables. If ethernet is used the MAC
address of the interface defined for the session is set by the Switch
ID object.

The adjacency parameters are defined; such as
- Max supported GSMP version
- Time between the periodic adjacency messages
- Switch Name, local port number, and instance number.
- Whether partitions are being used and the partition ID for this
  specific partition if partitions are used.
- The switch type could be set.
- The suggested maximum window size for unacknowledged request
  messages.

Also, a notification mapping is set to specify for with events the
corresponding SNMP notifications are sent.

3.4.3 GSMP Encapsulation groups

The ATM Encapsulation Table and the TCP/IP Encapsulation Table
provides a way to configure information that are encapsulation
specific. The encapsulation data is further specified in [RFC3293].

If ATM encapsulation is used, the interface and the virtual channel
are specified.

If TCP/IP is used, the IP address and the port number are specified.

No special config data needed if Ethernet encapsulation is used.

This mib MAY be extended with new, standard or proprietary, GSMP
encapsulation types. If a new encapsulation type needs to be added,
it SHOULD be done in the form of a new table with the entity ID as an
index. A row in that encapsulation table SHOULD be created before
any row in a GSMP entity table is created that is using this new GSMP
encapsulation.

3.4.4 GSMP General group

   The GSMP session table provides a way to monitor and maintain GSMP
   sessions.

   The session is defined by a Switch Controller Entity and Switch
   Entity pair.

3.4.5 The GSMP Notifications Group

   The GSMP Notification Group defines notifications for GSMP entities.
   These notifications provide a mechanism for a GSMP device to inform
   the management station of status changes. Also a notification is
   defined for each type of GSMP events.

   The group of notifications consists of the following notifications:

   - gsmpSessionDown

   This notification is generated when a session is terminating and also
   reports the final accounting statistics of the session.

   - gsmpSessionUp

   This notification is generated when a new session is established.

   - gsmpSendFailureInd

   This notification is generated when a message with a failure
   indication was sent. This means that this notification identifies a
   change to the gsmpSessionStatFailureInds object in a row of the
   gsmpSessionTable.

   - gsmpReceivedFailureInd

   This notification is generated when a message with a failure
   indication received. This means that this notification identifies a
   change to the gsmpSessionStatReceivedFailures object in a row of the
   gsmpSessionTable.

   - gsmpPortUpEvent

   This notification is generated when a Port Up Event is either
   received or sent.

- gsmpPortDownEvent

This notification is generated when a Port Down Event is either
received or sent.

- gsmpInvalidLabelEvent

This notification is generated when an Invalid Label Event is either
received or sent.

- gsmpNewPortEvent

This notification is generated when New Port Event either is received
or sent.

- gsmpDeadPortEvent

This notification is generated when a Dead Port Event is either
received or sent.

- gsmpAdjacencyUpdateEvent

This notification is generated when an Adjacency Update Event is
either received or sent.

To disable or enable the sending of each notification, the bits in
the bitmap are set to 0 or 1 in the Notification mapping objects in
the Controller Entitiy or Switch Entity tables.

The GSMP notification map capability should not be seen as a
duplication of the filter mechanism in the snmp notification
originator application [RFC2573], but as a compliment, to configure
the relation between GSMP events and the SNMP notifications already
in the GSMP agent. SNMP notifications and GSMP events operate
sometimes on a different timescale, and it may in some applications
be devastating for a SNMP application to receive events for each GSMP
events. E.g. the invalid label event in a ATM switch scenario may
cause mass SNMP notification flooding if mapped to a SNMP
notification.

3.5 Textual Conventions

The datatypes GsmpNameType, GsmpLabelType, GsmpVersion,
GsmpPartitionType, and GsmpPartitionIdType are used as textual
conventions in this document. These textual conventions are used for
the convenience of humans reading the MIB. Objects defined using
these conventions are always encoded by means of the rules that
define their primitive type. However, the textual conventions have

       special semantics associated with them. Hence, no changes to the SMI
       or the SNMP are necessary to accommodate these textual conventions
       which are adopted merely for the convenience of readers.

4. GSMP MIB Definitions

GSMP-MIB DEFINITIONS ::= BEGIN

      IMPORTS
          OBJECT-TYPE, MODULE-IDENTITY, NOTIFICATION-TYPE,
          Unsigned32, Integer32, mib-2
                  FROM SNMPv2-SMI   -- [RFC2578]
          RowStatus, TruthValue, TimeStamp,
          StorageType, TEXTUAL-CONVENTION
                  FROM SNMPv2-TC   -- [RFC2579]
          MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
                  FROM SNMPv2-CONF   -- [RFC2580]
          ZeroBasedCounter32
                  FROM RMON2-MIB   -- [RFC2021]
          InterfaceIndex
                  FROM IF-MIB   -- [RFC2863]
          AtmVcIdentifier, AtmVpIdentifier
                  FROM ATM-TC-MIB   -- [RFC2514]
          InetAddressType, InetAddress, InetPortNumber
                  FROM INET-ADDRESS-MIB ;   -- [RFC3291]

       gsmpMIB MODULE-IDENTITY
          LAST-UPDATED "200205310000Z" -- May 31, 2002
          ORGANIZATION "General Switch Management Protocol (gsmp)
                         Working Group, IETF"
          CONTACT-INFO
              "WG Charter:
              http://www.ietf.org/html.charters/gsmp-charter.html

              WG-email: gsmp@ietf.org
              Subscribe: gsmp-request@ietf.org
              Email Archive:
              ftp://ftp.ietf.org/ietf-mail-archive/gsmp/

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      DESCRIPTION
          "This MIB contains managed object definitions for the
          General Switch Management Protocol, GSMP, version 3"

      REVISION        "200205310000Z"
      DESCRIPTION "Initial Version, published as RFC 3295"

  ::= { mib-2 98 }

  gsmpNotifications                OBJECT IDENTIFIER ::= { gsmpMIB 0 }
  gsmpObjects                      OBJECT IDENTIFIER ::= { gsmpMIB 1 }
  gsmpNotificationsObjects         OBJECT IDENTIFIER ::= { gsmpMIB 2 }
  gsmpConformance                  OBJECT IDENTIFIER ::= { gsmpMIB 3 }

      --*********************************************************
      -- GSMP Textual Conventions
      --*********************************************************

  GsmpNameType ::= TEXTUAL-CONVENTION
      STATUS          current
      DESCRIPTION
          "The Name is a 48-bit quantity.
          A 48-bit IEEE 802 MAC address, if
          available, may be used."
      SYNTAX          OCTET STRING (SIZE(6))

  GsmpPartitionType ::= TEXTUAL-CONVENTION
      STATUS          current
      DESCRIPTION
          "Defining if partitions are used and how the partition id
          is negotiated. "
      SYNTAX          INTEGER {
                              noPartition(1),
                              fixedPartitionRequest(2),
                              fixedPartitionAssigned(3)
                              }

  GsmpPartitionIdType ::= TEXTUAL-CONVENTION
      STATUS          current
      DESCRIPTION
          "A 8-bit quantity. The format of the Partition ID is not
          defined in GSMP. If desired, the Partition ID can be
          divided into multiple sub-identifiers within a single
```

              partition. For example: the Partition ID could be
              subdivided into a 6-bit partition number and a 2-bit
              sub-identifier which would allow a switch to support 64
              partitions with 4 available IDs per partition."
          SYNTAX   OCTET STRING (SIZE(1))

     GsmpVersion ::= TEXTUAL-CONVENTION
          STATUS   current
          DESCRIPTION
             "The version numbers defined for the GSMP protocol.
              The version numbers used are defined in the
              specifications of the respective protocol,
              1 - GSMPv1.1 [RFC1987]
              2 - GSMPv2.0 [RFC2397]
              3 - GSMPv3   [RFC3292]
              Other numbers may be defined for other versions
              of the GSMP protocol."
          SYNTAX   Unsigned32

     GsmpLabelType ::= TEXTUAL-CONVENTION
          STATUS   current
          DESCRIPTION
             "The label is structured as a TLV, a tuple, consisting of
              a Type, a Length, and a Value. The structure is defined
              in [RFC 3292]. The label TLV is encoded as a 2 octet type
              field, followed by a 2 octet Length field, followed by a
              variable length Value field.
              Additionally, a label field can be composed of many stacked
              labels that together constitute the label."
          SYNTAX   OCTET STRING

     --***
     -- GSMP Entity Objects
     --***

     --
     -- Switch Controller Entity table
     --

     gsmpControllerTable OBJECT-TYPE
          SYNTAX   SEQUENCE OF GsmpControllerEntry
          MAX-ACCESS   not-accessible
          STATUS   current
          DESCRIPTION
             "This table represents the Switch Controller
              Entities. An entry in this table needs to be configured
              (created) before a GSMP session might be started."
          ::= { gsmpObjects 1 }

```
gsmpControllerEntry OBJECT-TYPE
    SYNTAX              GsmpControllerEntry
    MAX-ACCESS         not-accessible
    STATUS             current
    DESCRIPTION
        "An entry in the table showing
        the data for a specific Switch Controller
        Entity. If partitions are used, one entity
        corresponds to one specific switch partition.
        Depending of the encapsulation used,
        a corresponding row in the gsmpAtmEncapTable or the
        gsmpTcpIpEncapTable may have been created."
    INDEX { gsmpControllerEntityId }
    ::= { gsmpControllerTable 1 }

GsmpControllerEntry ::= SEQUENCE {
    gsmpControllerEntityId              GsmpNameType,
    gsmpControllerMaxVersion            GsmpVersion,
    gsmpControllerTimer                 Unsigned32,
    gsmpControllerPort                  Unsigned32,
    gsmpControllerInstance              Unsigned32,
    gsmpControllerPartitionType         GsmpPartitionType,
    gsmpControllerPartitionId           GsmpPartitionIdType,
    gsmpControllerDoResync              TruthValue,
    gsmpControllerNotificationMap       BITS,
    gsmpControllerSessionState          INTEGER,
    gsmpControllerStorageType           StorageType,
    gsmpControllerRowStatus             RowStatus
    }

gsmpControllerEntityId OBJECT-TYPE
    SYNTAX             GsmpNameType
    MAX-ACCESS         not-accessible
    STATUS             current
    DESCRIPTION
        "The Switch Controller Entity Id is unique
        within the operational context of the device."
    ::= { gsmpControllerEntry 1 }

gsmpControllerMaxVersion OBJECT-TYPE
    SYNTAX             GsmpVersion
    MAX-ACCESS         read-create
    STATUS             current
    DESCRIPTION
        "The max version number of the GSMP protocol being used
        in this session. The version is negotiated by the
        adjacency protocol."
    DEFVAL { 3 }
```

```
        ::= { gsmpControllerEntry 2 }

    gsmpControllerTimer OBJECT-TYPE
        SYNTAX          Unsigned32(1..255)
        UNITS           "100ms"
        MAX-ACCESS      read-create
        STATUS          current
        DESCRIPTION
            "The timer specifies the nominal time between
            periodic adjacency protocol messages. It is a constant
            for the duration of a GSMP session. The timer is
            specified in units of 100ms."
        DEFVAL { 10 }
        ::= { gsmpControllerEntry 3 }

    gsmpControllerPort OBJECT-TYPE
        SYNTAX          Unsigned32
        MAX-ACCESS      read-create
        STATUS          current
        DESCRIPTION
            "The local port number for the Switch Controller
            Entity."
        REFERENCE
            "General Switch Management Protocol V3: Section 3.1.2"
        ::= { gsmpControllerEntry 4 }

    gsmpControllerInstance OBJECT-TYPE
        SYNTAX          Unsigned32(1..16777215)
        MAX-ACCESS      read-only
        STATUS          current
        DESCRIPTION
            "The instance number for the Switch Controller
            Entity. The Instance number is a 24-bit number
            that should be guaranteed to be unique within
            the recent past and to change when the link
            or node comes back up after going down. Zero is
            not a valid instance number. "
        ::= { gsmpControllerEntry 5 }

    gsmpControllerPartitionType OBJECT-TYPE
        SYNTAX          GsmpPartitionType
        MAX-ACCESS      read-create
        STATUS          current
        DESCRIPTION
            "A controller can request the specific partition identifier
            to the session by setting the Partition Type to
            fixedPartitionRequest(2). A controller can let the switch
            decide whether it wants to assign a fixed partition ID or
```

        not, by setting the Partition Type to noPartition(1)."
    ::= { gsmpControllerEntry 6 }

    gsmpControllerPartitionId OBJECT-TYPE
        SYNTAX   GsmpPartitionIdType
        MAX-ACCESS   read-create
        STATUS   current
        DESCRIPTION
            "The Id for the specific switch partition that this
            Switch Controller is concerned with.
            If partitions are not used or if the controller lets the
            switch assigns Partition ID, i.e Partition Type =
            noPartition(1), then this object is undefined."
        ::= { gsmpControllerEntry 7 }

    gsmpControllerDoResync OBJECT-TYPE
        SYNTAX   TruthValue
        MAX-ACCESS   read-create
        STATUS   current
        DESCRIPTION
            "This object specifies whether the controller should
            resynchronise or reset in case of loss of synchronisation.
            If this object is set to true then the Controller should
            resync with PFLAG=2 (recovered adjacency)."
        DEFVAL { true }
        ::= { gsmpControllerEntry 8 }

    gsmpControllerNotificationMap OBJECT-TYPE
        SYNTAX   BITS {
                                    sessionDown(0),
                                    sessionUp(1),
                                    sendFailureIndication(2),
                                    receivedFailureIndication(3),
                                    portUpEvent(4),
                                    portDownEvent(5),
                                    invalidLabelEvent(6),
                                    newPortEvent(7),
                                    deadPortEvent(8),
                                    adjacencyUpdateEvent(9)
                             }
        MAX-ACCESS   read-create
        STATUS   current
        DESCRIPTION
            "This bitmap defines whether a corresponding SNMP
            notification should be sent if a GSMP event is received
            by the Switch Controller. If the bit is set to 1 a
            notification should be sent. The handling and filtering of
            the SNMP notifications are then further specified in the

```
            SNMP notification originator application. "
      DEFVAL {{ sessionDown, sessionUp,
            sendFailureIndication, receivedFailureIndication }}
      ::= { gsmpControllerEntry 9 }

   gsmpControllerSessionState OBJECT-TYPE
         SYNTAX            INTEGER {
                                    null(1),
                                    synsent(2),
                                    synrcvd(3),
                                    estab(4)
                                  }
         MAX-ACCESS       read-only
         STATUS           current
         DESCRIPTION
            "The state for the existing or potential session that
            this entity is concerned with.
            The NULL state is returned if the proper encapsulation
            data is not yet configured, if the row is not in active
            status or if the session is in NULL state as defined in
            the GSMP specification."
         ::= { gsmpControllerEntry 10}

   gsmpControllerStorageType OBJECT-TYPE
         SYNTAX            StorageType
         MAX-ACCESS       read-create
         STATUS           current
         DESCRIPTION
            "The storage type for this controller entity.
            Conceptual rows having the value 'permanent' need not allow
            write-access to any columnar objects in the row."
         DEFVAL { nonVolatile }
         ::= { gsmpControllerEntry 11 }

   gsmpControllerRowStatus OBJECT-TYPE
         SYNTAX            RowStatus
         MAX-ACCESS       read-create
         STATUS           current
         DESCRIPTION
            "An object that allows entries in this table to
            be created and deleted using the
            RowStatus convention.
            While the row is in active state it's not
            possible to modify the value of any object
            for that row except the gsmpControllerNotificationMap
            and the gsmpControllerRowStatus objects."
         ::= { gsmpControllerEntry 12 }
```

```
     --
     -- Switch Entity table
     --

     gsmpSwitchTable OBJECT-TYPE
         SYNTAX          SEQUENCE OF GsmpSwitchEntry
         MAX-ACCESS      not-accessible
         STATUS          current
         DESCRIPTION
             "This table represents the Switch
             Entities. An entry in this table needs to be configured
             (created) before a GSMP session might be started."
         ::= { gsmpObjects 2 }

     gsmpSwitchEntry OBJECT-TYPE
         SYNTAX          GsmpSwitchEntry
         MAX-ACCESS      not-accessible
         STATUS          current
         DESCRIPTION
             "An entry in the table showing
             the data for a specific Switch
             Entity. If partitions are used, one entity
             corresponds to one specific switch partition.
             Depending of the encapsulation used,
             a corresponding row in the gsmpAtmEncapTable or the
             gsmpTcpIpEncapTable may have been created."
         INDEX { gsmpSwitchEntityId }
         ::= { gsmpSwitchTable 1 }

     GsmpSwitchEntry ::= SEQUENCE {
         gsmpSwitchEntityId              GsmpNameType,
         gsmpSwitchMaxVersion            GsmpVersion,
         gsmpSwitchTimer                 Unsigned32,
         gsmpSwitchName                  GsmpNameType,
         gsmpSwitchPort                  Unsigned32,
         gsmpSwitchInstance              Unsigned32,
         gsmpSwitchPartitionType         GsmpPartitionType,
         gsmpSwitchPartitionId           GsmpPartitionIdType,
         gsmpSwitchNotificationMap       BITS,
         gsmpSwitchSwitchType            OCTET STRING,
         gsmpSwitchWindowSize            Unsigned32,
         gsmpSwitchSessionState          INTEGER,
         gsmpSwitchStorageType           StorageType,
         gsmpSwitchRowStatus             RowStatus
         }

     gsmpSwitchEntityId OBJECT-TYPE
         SYNTAX          GsmpNameType
```

```
        MAX-ACCESS       not-accessible
        STATUS           current
        DESCRIPTION
            "The Switch Entity Id is unique
             within the operational context of the device. "
        ::= { gsmpSwitchEntry 1 }

    gsmpSwitchMaxVersion OBJECT-TYPE
        SYNTAX           GsmpVersion
        MAX-ACCESS       read-create
        STATUS           current
        DESCRIPTION
            "The max version number of the GSMP protocol being
             supported by this Switch. The version is negotiated by
             the adjacency protocol."
        DEFVAL { 3 }
        ::= { gsmpSwitchEntry 2 }

    gsmpSwitchTimer OBJECT-TYPE
        SYNTAX           Unsigned32(1..255)
        UNITS            "100ms"
        MAX-ACCESS       read-create
        STATUS           current
        DESCRIPTION
            "The timer specifies the nominal time between
             periodic adjacency protocol messages. It is a constant
             for the duration of a GSMP session. The timer is
             specified in units of 100ms."
        DEFVAL { 10 }
        ::= { gsmpSwitchEntry 3 }

    gsmpSwitchName OBJECT-TYPE
        SYNTAX           GsmpNameType
        MAX-ACCESS       read-create
        STATUS           current
        DESCRIPTION
            "The name of the Switch. The first three octets must be an
             Organisationally Unique Identifier (OUI) that identifies
             the manufacturer of the Switch. This is by default set to
             the same value as the gsmpSwitchId object if not
             separately specified. "
        ::= {gsmpSwitchEntry 4 }

    gsmpSwitchPort OBJECT-TYPE
        SYNTAX           Unsigned32
        MAX-ACCESS       read-create
        STATUS           current
        DESCRIPTION
```

```
            "The local port number for this Switch Entity."
        REFERENCE
           "General Switch Management Protocol V3: Section 3.1.2"
        ::= { gsmpSwitchEntry 5 }

    gsmpSwitchInstance OBJECT-TYPE
        SYNTAX           Unsigned32(1..16777215)
        MAX-ACCESS       read-only
        STATUS           current
        DESCRIPTION
            "The instance number for the Switch Entity.
            The Instance number is a 24-bit number
            that should be guaranteed to be unique within
            the recent past and to change when the link
            or node comes back up after going down. Zero is
            not a valid instance number."
        ::= { gsmpSwitchEntry 6 }

    gsmpSwitchPartitionType OBJECT-TYPE
        SYNTAX           GsmpPartitionType
        MAX-ACCESS       read-create
        STATUS           current
        DESCRIPTION
            "A switch can assign the specific partition identifier to
            the session by setting the Partition Type to
            fixedPartitionAssigned(3). A switch can specify
            that no partitions are handled in the session by setting
            the Partition Type to noPartition(1)."
        ::= { gsmpSwitchEntry 7 }

    gsmpSwitchPartitionId OBJECT-TYPE
        SYNTAX           GsmpPartitionIdType
        MAX-ACCESS       read-create
        STATUS           current
        DESCRIPTION
            "The Id for this specific switch partition that the switch
            entity represents. If partitions are not used, i.e.
            Partition Type = noPartition(1), then this object is
            undefined."
        ::= { gsmpSwitchEntry 8 }

    gsmpSwitchNotificationMap OBJECT-TYPE
        SYNTAX           BITS {
                            sessionDown(0),
                            sessionUp(1),
                            sendFailureIndication(2),
                            receivedFailureIndication(3),
                            portUpEvent(4),
```

```
                             portDownEvent(5),
                             invalidLabelEvent(6),
                             newPortEvent(7),
                             deadPortEvent(8),
                             adjacencyUpdateEvent(9)
                        }
     MAX-ACCESS       read-create
     STATUS           current
     DESCRIPTION
         "This bitmap defines whether a corresponding SNMP
         notification should be sent if an GSMP event is sent
         by the Switch Entity. If the bit is set to 1 a
         notification should be sent. The handling and filtering of
         the SNMP notifications are then further specified in the
         SNMP notification originator application. "
     DEFVAL {{ sessionDown, sessionUp,
         sendFailureIndication, receivedFailureIndication }}
     ::= { gsmpSwitchEntry 9 }

  gsmpSwitchSwitchType OBJECT-TYPE
     SYNTAX           OCTET STRING (SIZE(2))
     MAX-ACCESS       read-create
     STATUS           current
     DESCRIPTION
         "A 16-bit field allocated by the manufacturer
         of the switch. The Switch Type
         identifies the product. When the Switch Type is combined
         with the OUI from the Switch Name the product is
         uniquely identified. "
     ::= { gsmpSwitchEntry 10 }

  gsmpSwitchWindowSize OBJECT-TYPE
     SYNTAX           Unsigned32(1..65535)
     MAX-ACCESS       read-create
     STATUS           current
     DESCRIPTION
         "The maximum number of unacknowledged request messages
         that may be transmitted by the controller without the
         possibility of loss. This field is used to prevent
         request messages from being lost in the switch because of
         overflow in the receive buffer. The field is a hint to
         the controller."
     ::= { gsmpSwitchEntry 11 }

  gsmpSwitchSessionState OBJECT-TYPE
     SYNTAX             INTEGER {
                             null(1),
                             synsent(2),
```

```
                                     synrcvd(3),
                                     estab(4)
                                     }
        MAX-ACCESS          read-only
        STATUS              current
        DESCRIPTION
            "The state for the existing or potential session that
            this entity is concerned with.
            The NULL state is returned if the proper encapsulation
            data is not yet configured, if the row is not in active
            status or if the session is in NULL state as defined in
            the GSMP specification."
        ::= { gsmpSwitchEntry 12}

    gsmpSwitchStorageType OBJECT-TYPE
        SYNTAX          StorageType
        MAX-ACCESS      read-create
        STATUS          current
        DESCRIPTION
            "The storage type for this switch entity.
            Conceptual rows having the value 'permanent' need not allow
            write-access to any columnar objects in the row."
        DEFVAL { nonVolatile }
        ::= { gsmpSwitchEntry 13 }

    gsmpSwitchRowStatus OBJECT-TYPE
        SYNTAX          RowStatus
        MAX-ACCESS      read-create
        STATUS          current
        DESCRIPTION
            "An object that allows entries in this table to
            be created and deleted using the
            RowStatus convention.
            While the row is in active state it's not
            possible to modify the value of any object
            for that row except the gsmpSwitchNotificationMap
            and the gsmpSwitchRowStatus objects."
        ::= { gsmpSwitchEntry 14 }

    --*****************************************************************
    -- GSMP Encapsulation Objects
    --*****************************************************************

    --
    -- GSMP ATM Encapsulation Table
    --

    gsmpAtmEncapTable OBJECT-TYPE
```

```
        SYNTAX              SEQUENCE OF GsmpAtmEncapEntry
        MAX-ACCESS          not-accessible
        STATUS              current
        DESCRIPTION
            "This table contains the atm encapsulation data
            for the Controller or Switch that uses atm aal5 as
            encapsulation. "
        ::= { gsmpObjects 3 }

    gsmpAtmEncapEntry OBJECT-TYPE
        SYNTAX              GsmpAtmEncapEntry
        MAX-ACCESS          not-accessible
        STATUS              current
        DESCRIPTION
            "An entry in the table showing
            the encapsulation data for a specific
            Switch Controller entity or Switch entity."
        INDEX { gsmpAtmEncapEntityId }
        ::= { gsmpAtmEncapTable 1 }

    GsmpAtmEncapEntry ::= SEQUENCE {
        gsmpAtmEncapEntityId                GsmpNameType,
        gsmpAtmEncapIfIndex                 InterfaceIndex,
        gsmpAtmEncapVpi                     AtmVpIdentifier,
        gsmpAtmEncapVci                     AtmVcIdentifier,
        gsmpAtmEncapStorageType             StorageType,
        gsmpAtmEncapRowStatus               RowStatus
        }

    gsmpAtmEncapEntityId OBJECT-TYPE
        SYNTAX              GsmpNameType
        MAX-ACCESS          not-accessible
        STATUS              current
        DESCRIPTION
            "The Controller Id or Switch Id that is unique
            within the operational context of the device. "
        ::= { gsmpAtmEncapEntry 1 }

    gsmpAtmEncapIfIndex OBJECT-TYPE
        SYNTAX              InterfaceIndex
        MAX-ACCESS          read-create
        STATUS              current
        DESCRIPTION
            "The interface index for the virtual channel over which
            the GSMP session is established, i.e., the GSMP control
            channel for LLC/SNAP encapsulated GSMP messages on an
            ATM data link layer."
        ::= { gsmpAtmEncapEntry 2 }
```

```
    gsmpAtmEncapVpi OBJECT-TYPE
        SYNTAX          AtmVpIdentifier
        MAX-ACCESS      read-create
        STATUS          current
        DESCRIPTION
            " The VPI value for the virtual channel over which the
            GSMP session is established, i.e., the GSMP control
            channel for LLC/SNAP encapsulated GSMP messages on an
            ATM data link layer."
        DEFVAL { 0 }
        ::= { gsmpAtmEncapEntry 3 }

  gsmpAtmEncapVci OBJECT-TYPE
        SYNTAX          AtmVcIdentifier
        MAX-ACCESS      read-create
        STATUS          current
        DESCRIPTION
            " The VCI value for the virtual channel over which the
            GSMP session is established, i.e., the GSMP control
            channel for LLC/SNAP encapsulated GSMP messages on an
            ATM data link layer."
        DEFVAL { 15 }
        ::= { gsmpAtmEncapEntry 4 }

    gsmpAtmEncapStorageType OBJECT-TYPE
        SYNTAX          StorageType
        MAX-ACCESS      read-create
        STATUS          current
        DESCRIPTION
            "The storage type for this entry. It should have the same
            value as the StorageType in the referring Switch
            Controller entity or Switch entity."
        DEFVAL { nonVolatile }
        ::= { gsmpAtmEncapEntry 5 }

    gsmpAtmEncapRowStatus OBJECT-TYPE
        SYNTAX          RowStatus
        MAX-ACCESS      read-create
        STATUS          current
        DESCRIPTION
            "An object that allows entries in this table to
            be created and deleted using the
            RowStatus convention.
            While the row is in active state it's not
            possible to modify the value of any object
            for that row except the gsmpAtmEncapRowStatus object."
        ::= { gsmpAtmEncapEntry 6 }
```

```
     --
     -- GSMP TCP/IP Encapsulation Table
     --

     gsmpTcpIpEncapTable OBJECT-TYPE
           SYNTAX              SEQUENCE OF GsmpTcpIpEncapEntry
           MAX-ACCESS          not-accessible
           STATUS              current
           DESCRIPTION
               "This table contains the encapsulation data
                for the Controller or Switch that uses TCP/IP as
                encapsulation."
         ::= { gsmpObjects 4 }

     gsmpTcpIpEncapEntry OBJECT-TYPE
           SYNTAX              GsmpTcpIpEncapEntry
           MAX-ACCESS          not-accessible
           STATUS              current
           DESCRIPTION
               "An entry in the table showing
                the encapsulation data for a specific
                Switch Controller entity or Switch entity."
           INDEX { gsmpTcpIpEncapEntityId }
         ::= { gsmpTcpIpEncapTable 1 }

     GsmpTcpIpEncapEntry ::= SEQUENCE {
         gsmpTcpIpEncapEntityId              GsmpNameType,
         gsmpTcpIpEncapAddressType           InetAddressType,
         gsmpTcpIpEncapAddress               InetAddress,
         gsmpTcpIpEncapPortNumber            InetPortNumber,
         gsmpTcpIpEncapStorageType           StorageType,
         gsmpTcpIpEncapRowStatus             RowStatus
         }

     gsmpTcpIpEncapEntityId OBJECT-TYPE
           SYNTAX              GsmpNameType
           MAX-ACCESS          not-accessible
           STATUS              current
           DESCRIPTION
               "The Controller or Switch Id is unique
                within the operational context of the device. "
         ::= { gsmpTcpIpEncapEntry 1 }

     gsmpTcpIpEncapAddressType OBJECT-TYPE
           SYNTAX              InetAddressType
           MAX-ACCESS          read-create
           STATUS              current
           DESCRIPTION
```

               "The type of address in gsmpTcpIpEncapAddress."
          ::= { gsmpTcpIpEncapEntry 2 }

     gsmpTcpIpEncapAddress OBJECT-TYPE
          SYNTAX   InetAddress
          MAX-ACCESS   read-create
          STATUS   current
          DESCRIPTION
              "The IPv4 or IPv6 address used for
              the GSMP session peer."
          ::= { gsmpTcpIpEncapEntry 3 }

     gsmpTcpIpEncapPortNumber OBJECT-TYPE
              SYNTAX   InetPortNumber
              MAX-ACCESS   read-create
              STATUS   current
              DESCRIPTION
                "The TCP port number used for the TCP session
                establishment to the GSMP peer."
              DEFVAL { 6068 }
              ::= { gsmpTcpIpEncapEntry 4 }

     gsmpTcpIpEncapStorageType OBJECT-TYPE
              SYNTAX   StorageType
              MAX-ACCESS   read-create
              STATUS   current
              DESCRIPTION
                "The storage type for this entry. It should have the same
                value as the StorageType in the referring Switch
                Controller entity or Switch entity."
              DEFVAL { nonVolatile }
              ::= { gsmpTcpIpEncapEntry 5 }

     gsmpTcpIpEncapRowStatus OBJECT-TYPE
              SYNTAX   RowStatus
              MAX-ACCESS   read-create
              STATUS   current
              DESCRIPTION
                "An object that allows entries in this table to
                be created and deleted using the
                RowStatus convention.
                While the row is in active state it's not
                possible to modify the value of any object
                for that row except the gsmpTcpIpEncapRowStatus object."
              ::= { gsmpTcpIpEncapEntry 6 }

     --**
     -- GSMP Session Objects

```
      --******************************************************************

      --
      -- GSMP Session table
      --

      gsmpSessionTable OBJECT-TYPE
              SYNTAX              SEQUENCE OF GsmpSessionEntry
              MAX-ACCESS      not-accessible
              STATUS              current
              DESCRIPTION
                 "This table represents the sessions between
                  Controller and Switch pairs. "
          ::= { gsmpObjects 5 }

      gsmpSessionEntry OBJECT-TYPE
              SYNTAX          GsmpSessionEntry
              MAX-ACCESS      not-accessible
              STATUS          current
              DESCRIPTION
                  "An entry in the table showing
                   the session data for a specific Controller and
                   Switch pair. Also, statistics for this specific
                   session is shown."
              INDEX { gsmpSessionThisSideId, gsmpSessionFarSideId }
          ::= { gsmpSessionTable 1 }

      GsmpSessionEntry ::= SEQUENCE {
          gsmpSessionThisSideId                     GsmpNameType,
          gsmpSessionFarSideId                      GsmpNameType,
          gsmpSessionVersion                        GsmpVersion,
          gsmpSessionTimer                          Integer32,
          gsmpSessionPartitionId                    GsmpPartitionIdType,
          gsmpSessionAdjacencyCount                 Unsigned32,
          gsmpSessionFarSideName                    GsmpNameType,
          gsmpSessionFarSidePort                    Unsigned32,
          gsmpSessionFarSideInstance                Unsigned32,
          gsmpSessionLastFailureCode                Unsigned32,
          gsmpSessionDiscontinuityTime              TimeStamp,
          gsmpSessionStartUptime                    TimeStamp,
          gsmpSessionStatSentMessages               ZeroBasedCounter32,
          gsmpSessionStatFailureInds                ZeroBasedCounter32,
          gsmpSessionStatReceivedMessages           ZeroBasedCounter32,
          gsmpSessionStatReceivedFailures           ZeroBasedCounter32,
          gsmpSessionStatPortUpEvents               ZeroBasedCounter32,
          gsmpSessionStatPortDownEvents             ZeroBasedCounter32,
          gsmpSessionStatInvLabelEvents             ZeroBasedCounter32,
          gsmpSessionStatNewPortEvents              ZeroBasedCounter32,
```

```
        gsmpSessionStatDeadPortEvents               ZeroBasedCounter32,
        gsmpSessionStatAdjUpdateEvents              ZeroBasedCounter32
        }

  gsmpSessionThisSideId OBJECT-TYPE
      SYNTAX          GsmpNameType
      MAX-ACCESS      not-accessible
      STATUS          current
      DESCRIPTION
          "This side ID uniquely identifies the entity that this
           session relates to within the operational
           context of the device. "
      ::= { gsmpSessionEntry 1 }

  gsmpSessionFarSideId OBJECT-TYPE
      SYNTAX          GsmpNameType
      MAX-ACCESS      not-accessible
      STATUS          current
      DESCRIPTION
          "The Far side ID uniquely identifies the entity that this
           session is established against. "
      ::= { gsmpSessionEntry 2 }

  gsmpSessionVersion OBJECT-TYPE
      SYNTAX          GsmpVersion
      MAX-ACCESS      read-only
      STATUS          current
      DESCRIPTION
          "The version number of the GSMP protocol being used in
           this session. The version is the result of the
           negotiation by the adjacency protocol."
      ::= { gsmpSessionEntry 3 }

  gsmpSessionTimer OBJECT-TYPE
      SYNTAX          Integer32
      UNITS           "100ms"
      MAX-ACCESS      read-only
      STATUS          current
      DESCRIPTION
          "The timer specifies the time remaining until the
           adjacency timer expires. The object could take negative
           values since if no valid GSMP messages are
           received in any period of time in excess of three times
           the value of the Timer negotiated by the adjacency
           protocol loss of synchronisation may be declared. The
           timer is specified in units of 100ms."
      ::= { gsmpSessionEntry 4 }
```

```
gsmpSessionPartitionId OBJECT-TYPE
    SYNTAX          GsmpPartitionIdType
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The Partition Id for the specific switch partition that
        this session is concerned with."
    ::= { gsmpSessionEntry 5 }

gsmpSessionAdjacencyCount OBJECT-TYPE
    SYNTAX          Unsigned32(1..255)
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "This object specifies the current number of adjacencies
        that are established with controllers and the switch
        partition that is used for this session. The value
        includes this session."
    ::= { gsmpSessionEntry 6 }

gsmpSessionFarSideName OBJECT-TYPE
    SYNTAX          GsmpNameType
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The name of the far side as advertised in the adjacency
        message."
    ::= {gsmpSessionEntry 7}

gsmpSessionFarSidePort OBJECT-TYPE
    SYNTAX          Unsigned32
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The local port number of the link across which the
        message is being sent."
    REFERENCE
       "General Switch Management Protocol V3: Section 3.1.2"
    ::= { gsmpSessionEntry 8 }

gsmpSessionFarSideInstance OBJECT-TYPE
    SYNTAX          Unsigned32(1..16777215)
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The instance number used for the link during this
        session. The Instance number is a 24-bit number
        that should be guaranteed to be unique within
```

                the recent past and to change when the link
                or node comes back up after going down. Zero is not
                a valid instance number."
            ::= { gsmpSessionEntry 9 }

        gsmpSessionLastFailureCode OBJECT-TYPE
            SYNTAX   Unsigned32(0..255)
            MAX-ACCESS   read-only
            STATUS   current
            DESCRIPTION
                "This is the last failure code that was received over
                this session. If no failure code have been received, the
                value is zero."
            ::= { gsmpSessionEntry 10 }

        gsmpSessionDiscontinuityTime OBJECT-TYPE
            SYNTAX   TimeStamp
            MAX-ACCESS   read-only
            STATUS   current
            DESCRIPTION
                "The value of sysUpTime on the most recent occasion at
                which one or more of this session's counters
                suffered a discontinuity. If no such discontinuities have
                occurred since then, this object contains the same
                timestamp as gsmpSessionStartUptime ."
             ::= { gsmpSessionEntry 11 }

        gsmpSessionStartUptime OBJECT-TYPE
            SYNTAX   TimeStamp
            MAX-ACCESS   read-only
            STATUS   current
            DESCRIPTION
                " The value of sysUpTime when the session came to
                established state."
            ::= { gsmpSessionEntry 12 }

        gsmpSessionStatSentMessages OBJECT-TYPE
            SYNTAX   ZeroBasedCounter32
            MAX-ACCESS   read-only
            STATUS   current
            DESCRIPTION
                "The number of messages that have been sent in this
                session. All GSMP messages pertaining to this session after
                the session came to established state SHALL
                be counted, also including adjacency protocol messages
                and failure response messages.
                When the counter suffers any discontinuity, then
                the gsmpSessionDiscontinuityTime object indicates when it

```
            happened."
        ::= { gsmpSessionEntry 13 }

    gsmpSessionStatFailureInds OBJECT-TYPE
        SYNTAX          ZeroBasedCounter32
        MAX-ACCESS      read-only
        STATUS          current
        DESCRIPTION
            "The number of messages that have been sent with a
            failure indication in this session. Warning messages
            SHALL NOT be counted.
            When the counter suffers any discontinuity, then
            the gsmpSessionDiscontinuityTime object indicates when it
            happened."
        REFERENCE
            "General Switch Management Protocol V3: Section 12.1"
        ::= { gsmpSessionEntry 14 }

    gsmpSessionStatReceivedMessages OBJECT-TYPE
        SYNTAX          ZeroBasedCounter32
        MAX-ACCESS      read-only
        STATUS          current
        DESCRIPTION
            "The number of messages that have been received in
            this session. All legal GSMP messages pertaining to this
            session after the session came to established state SHALL
            be counted, also including adjacency protocol messages
            and failure response messages.
            When the counter suffers any discontinuity, then
            the gsmpSessionDiscontinuityTime object indicates when it
            happened."
        ::= { gsmpSessionEntry 15 }

    gsmpSessionStatReceivedFailures OBJECT-TYPE
        SYNTAX          ZeroBasedCounter32
        MAX-ACCESS      read-only
        STATUS          current
        DESCRIPTION
            "The number of messages that have been received in
            this session with a failure indication. Warning messages
            SHALL NOT be counted.
            When the counter suffers any discontinuity, then
            the gsmpSessionDiscontinuityTime object indicates when it
            happened."
        REFERENCE
            "General Switch Management Protocol V3: Section 12.1"
        ::= { gsmpSessionEntry 16 }
```

```
gsmpSessionStatPortUpEvents OBJECT-TYPE
     SYNTAX          ZeroBasedCounter32
     MAX-ACCESS      read-only
     STATUS          current
     DESCRIPTION
         "The number of Port Up events that have been sent or
         received on this session.
         When the counter suffers any discontinuity, then
         the gsmpSessionDiscontinuityTime object indicates when it
         happened."
     REFERENCE
        "General Switch Management Protocol V3: Section 9.1"
     ::= { gsmpSessionEntry 17 }

gsmpSessionStatPortDownEvents OBJECT-TYPE
     SYNTAX          ZeroBasedCounter32
     MAX-ACCESS      read-only
     STATUS          current
     DESCRIPTION
         "The number of Port Down events that have been sent or
         received on this session.
         When the counter suffers any discontinuity, then
         the gsmpSessionDiscontinuityTime object indicates when it
         happened."
     REFERENCE
        "General Switch Management Protocol V3: Section 9.2"
     ::= { gsmpSessionEntry 18 }

gsmpSessionStatInvLabelEvents OBJECT-TYPE
     SYNTAX          ZeroBasedCounter32
     MAX-ACCESS      read-only
     STATUS          current
     DESCRIPTION
         "The number of Invalid label events that have been sent
         or received on this session.
         When the counter suffers any discontinuity, then
         the gsmpSessionDiscontinuityTime object indicates when it
         happened."
     REFERENCE
        "General Switch Management Protocol V3: Section 9.3"
     ::= { gsmpSessionEntry 19 }

gsmpSessionStatNewPortEvents OBJECT-TYPE
     SYNTAX          ZeroBasedCounter32
     MAX-ACCESS      read-only
     STATUS          current
     DESCRIPTION
         "The number of New Port events that have been sent or
```

```
                received on this session.
                When the counter suffers any discontinuity, then
                the gsmpSessionDiscontinuityTime object indicates when it
                happened."
           REFERENCE
              "General Switch Management Protocol V3: Section 9.4"
           ::= { gsmpSessionEntry 20 }

        gsmpSessionStatDeadPortEvents OBJECT-TYPE
           SYNTAX          ZeroBasedCounter32
           MAX-ACCESS      read-only
           STATUS          current
           DESCRIPTION
              "The number of Dead Port events that have been sent or
                received on this session.
                When the counter suffers any discontinuity, then
                the gsmpSessionDiscontinuityTime object indicates when it
                happened."
           REFERENCE
              "General Switch Management Protocol V3: Section 9.5"
           ::= { gsmpSessionEntry 21 }

        gsmpSessionStatAdjUpdateEvents OBJECT-TYPE
           SYNTAX          ZeroBasedCounter32
           MAX-ACCESS      read-only
           STATUS          current
           DESCRIPTION
              "The number of Adjacency Update events that have been sent
                or received on this session.
                When the counter suffers any discontinuity, then
                the gsmpSessionDiscontinuityTime object indicates when it
                happened."
           REFERENCE
              "General Switch Management Protocol V3: Section 9.6"
           ::= { gsmpSessionEntry 22 }


        -- ****************************************************************
        -- GSMP Notifications
        -- ****************************************************************


        --
        -- Notification objects
        --

        gsmpEventPort OBJECT-TYPE
           SYNTAX          Unsigned32
           MAX-ACCESS      accessible-for-notify
```

```
                STATUS            current
                DESCRIPTION
                   "This object specifies the Port Number that is
                   carried in this event."
                ::= { gsmpNotificationsObjects 1 }

       gsmpEventPortSessionNumber OBJECT-TYPE
                SYNTAX            Unsigned32
                MAX-ACCESS        accessible-for-notify
                STATUS            current
                DESCRIPTION
                   "This object specifies the Port Session Number that is
                   carried in this event."
                ::= { gsmpNotificationsObjects 2 }

       gsmpEventSequenceNumber OBJECT-TYPE
                SYNTAX            Unsigned32
                MAX-ACCESS        accessible-for-notify
                STATUS            current
                DESCRIPTION
                   "This object specifies the Event Sequence Number that is
                   carried in this event."
                ::= { gsmpNotificationsObjects 3 }

       gsmpEventLabel OBJECT-TYPE
                SYNTAX            GsmpLabelType
                MAX-ACCESS        accessible-for-notify
                STATUS            current
                DESCRIPTION
                   "This object specifies the Label that is
                   carried in this event."
                ::= { gsmpNotificationsObjects 4 }


    --
    -- Notifications
    --

     gsmpSessionDown NOTIFICATION-TYPE
             OBJECTS {
                        gsmpSessionStartUptime,
                        gsmpSessionStatSentMessages,
                        gsmpSessionStatFailureInds,
                        gsmpSessionStatReceivedMessages,
                        gsmpSessionStatReceivedFailures,
                        gsmpSessionStatPortUpEvents,
                        gsmpSessionStatPortDownEvents,
                        gsmpSessionStatInvLabelEvents,
```

```
                    gsmpSessionStatNewPortEvents,
                    gsmpSessionStatDeadPortEvents,
                    gsmpSessionStatAdjUpdateEvents
                    }
        STATUS current
        DESCRIPTION
            "When it has been enabled, this notification is
            generated whenever a session is taken down, regardless
            of whether the session went down normally or not.
            Its purpose is to allow a management application
            (primarily an accounting application) that is
            monitoring the session statistics to receive the final
            values of these counters, so that the application can
            properly account for the amounts the counters were
            incremented since the last time the application polled
            them. The gsmpSessionStartUptime object provides the
            total amount of time that the session was active.

            This notification is not a substitute for polling the
            session statistic counts. In particular, the count
            values reported in this notification cannot be assumed
            to be the complete totals for the life of the session,
            since they may have wrapped while the
            session was up.

            The session to which this notification
            applies is identified by the gsmpSessionThisSideId and
            gsmpSessionFarSideId which could be inferred from the
            Object Identifiers of the objects contained in the
            notification.
            An instance of this notification will contain exactly
            one instance of each of its objects, and these objects
            will all belong to the same conceptual row of the
            gsmpSessionTable."
    ::= { gsmpNotifications 1 }

    gsmpSessionUp NOTIFICATION-TYPE
        OBJECTS {
                gsmpSessionFarSideInstance
                }
        STATUS current
        DESCRIPTION
            "When it has been enabled, this notification is
            generated when new session is established.

            The new session is identified by the gsmpSessionThisSideId
            and gsmpSessionFarSideId which could be inferred from the
            Object Identifier of the gsmpSessionFarSideInstance object
```

```
            contained in the notification."
     ::= { gsmpNotifications 2 }

     gsmpSentFailureInd NOTIFICATION-TYPE
         OBJECTS {
                  gsmpSessionLastFailureCode,
                  gsmpSessionStatFailureInds
                  }
         STATUS current
         DESCRIPTION
             "When it has been enabled, this notification is
             generated when a message with a failure indication was
             sent.

             The notification indicates a change in the value of
             gsmpSessionStatFailureInds. The
             gsmpSessionLastFailureCode contains the failure
             reason.

             The session to which this notification
             applies is identified by the gsmpSessionThisSideId and
             gsmpSessionFarSideId which could be inferred from the
             Object Identifiers of the objects contained in the
             notification."
     ::= { gsmpNotifications 3 }

     gsmpReceivedFailureInd NOTIFICATION-TYPE
         OBJECTS {
                  gsmpSessionLastFailureCode,
                  gsmpSessionStatReceivedFailures
                  }
         STATUS current
         DESCRIPTION
             "When it has been enabled, this notification is
             generate when a message with a failure indication
             is received.

             The notification indicates a change in the value of
             gsmpSessionStatReceivedFailures. The
             gsmpSessionLastFailureCode contains the failure
             reason.

             The session to which this notification
             applies is identified by the gsmpSessionThisSideId and
             gsmpSessionFarSideId which could be inferred from the
             Object Identifiers of the objects contained in the
             notification."
     ::= { gsmpNotifications 4 }
```

```
    gsmpPortUpEvent NOTIFICATION-TYPE
        OBJECTS {
                gsmpSessionStatPortUpEvents,
                gsmpEventPort,
                gsmpEventPortSessionNumber,
                gsmpEventSequenceNumber
                }
        STATUS current
        DESCRIPTION
            "When it has been enabled, this notification is
            generated when a Port Up Event occurs.

            The notification indicates a change in the value of
            gsmpSessionStatPortUpEvents.

            The session to which this notification
            applies is identified by the gsmpSessionThisSideId and
            gsmpSessionFarSideId which could be inferred from the
            Object Identifier of the gsmpSessionStatPortUpEvents
            object contained in the notification."
    ::= { gsmpNotifications 5 }

    gsmpPortDownEvent NOTIFICATION-TYPE
        OBJECTS {
                gsmpSessionStatPortDownEvents,
                gsmpEventPort,
                gsmpEventPortSessionNumber,
                gsmpEventSequenceNumber
                }
        STATUS current
        DESCRIPTION
            "When it has been enabled, this notification is
            generated when a Port Down Event occurs.

            The notification indicates a change in the value of
            gsmpSessionStatPortDownEvents.

            The session to which this notification
            applies is identified by the gsmpSessionThisSideId and
            gsmpSessionFarSideId which could be inferred from the
            Object Identifier of the gsmpSessionStatPortDownEvents
            object contained in the notification."
    ::= { gsmpNotifications 6 }

    gsmpInvalidLabelEvent NOTIFICATION-TYPE
        OBJECTS {
                gsmpSessionStatInvLabelEvents,
                gsmpEventPort,
```

```
                   gsmpEventLabel,
                   gsmpEventSequenceNumber
                   }
         STATUS current
         DESCRIPTION
             "When it has been enabled, this notification is
             generated when an Invalid Label Event occurs.

             The notification indicates a change in the value of
             gsmpSessionStatInvLabelEvents.

             The session to which this notification
             applies is identified by the gsmpSessionThisSideId and
             gsmpSessionFarSideId which could be inferred from the
             Object Identifier of the gsmpSessionStatInvLabelEvents
             object contained in the notification."
     ::= { gsmpNotifications 7 }

   gsmpNewPortEvent NOTIFICATION-TYPE
       OBJECTS {
                   gsmpSessionStatNewPortEvents,
                   gsmpEventPort,
                   gsmpEventPortSessionNumber,
                   gsmpEventSequenceNumber
                   }
         STATUS current
         DESCRIPTION
             "When it has been enabled, this notification is
             generated when a New Port Event occurs.

             The notification indicates a change in the value of
             gsmpSessionStatNewPortEvents.

             The session to which this notification
             applies is identified by the gsmpSessionThisSideId and
             gsmpSessionFarSideId which could be inferred from the
             Object Identifier of the gsmpSessionStatNewPortEvents
             object contained in the notification."
     ::= { gsmpNotifications 8 }

   gsmpDeadPortEvent NOTIFICATION-TYPE
       OBJECTS {
                   gsmpSessionStatDeadPortEvents,
                   gsmpEventPort,
                   gsmpEventPortSessionNumber,
                   gsmpEventSequenceNumber
                   }
         STATUS current
```

        DESCRIPTION
            "When it has been enabled, this notification is
            generated when a Dead Port Event occurs.

            The notification indicates a change in the value of
            gsmpSessionStatDeadPortEvents.

            The session to which this notification
            applies is identified by the gsmpSessionThisSideId and
            gsmpSessionFarSideId which could be inferred from the
            Object Identifier of the gsmpSessionStatDeadPortEvents
            object contained in the notification."
    ::= { gsmpNotifications 9 }

    gsmpAdjacencyUpdateEvent NOTIFICATION-TYPE
        OBJECTS {
                gsmpSessionAdjacencyCount,
                gsmpSessionStatAdjUpdateEvents,
                gsmpEventSequenceNumber
                }
        STATUS current
        DESCRIPTION
            "When it has been enabled, this notification is
            generated when an Adjacency Update Event occurs.

            The gsmpSessionAdjacencyCount contains the new value of
            the number of adjacencies
            that are established with controllers and the switch
            partition that is used for this session.

            The notification indicates a change in the value of
            gsmpSessionStatAdjUpdateEvents.

            The session to which this notification
            applies is identified by the gsmpSessionThisSideId and
            gsmpSessionFarSideId which could be inferred from the
            Object Identifier of the gsmpSessionAdjacencyCount
            or the gsmpSessionStatAdjUpdateEvents object contained
            in the notification."
    ::= { gsmpNotifications 10 }

```
   --***************************************************************
   -- GSMP Compliance
   --***************************************************************

   gsmpGroups              OBJECT IDENTIFIER ::= { gsmpConformance 1 }
   gsmpCompliances         OBJECT IDENTIFIER ::= { gsmpConformance 2 }

   gsmpModuleCompliance MODULE-COMPLIANCE
       STATUS current
       DESCRIPTION
           "The compliance statement for agents that support
           the GSMP MIB."
       MODULE -- this module
       MANDATORY-GROUPS { gsmpGeneralGroup
                         }
       GROUP gsmpControllerGroup
       DESCRIPTION
           "This group is mandatory for all Switch
           Controllers"

       GROUP gsmpSwitchGroup
       DESCRIPTION
           "This group is mandatory for all Switches"

       GROUP gsmpAtmEncapGroup
       DESCRIPTION
           "This group must be supported if ATM is used for GSMP
           encapsulation. "

       GROUP gsmpTcpIpEncapGroup
       DESCRIPTION
           "This group must be supported if TCP/IP is used for GSMP
           encapsulation. "

       OBJECT gsmpTcpIpEncapAddressType
       SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                               ipv4z(3), ipv6z(4) }
       DESCRIPTION
          "An implementation is only required to support
           'unknown(0)', and IPv4 addresses. Supporting addresses with
           zone index or IPv6 addresses are optional. Defining
           Internet addresses by using DNS domain names are not
           allowed."

       OBJECT gsmpTcpIpEncapAddress
       SYNTAX InetAddress (SIZE(0|4|8|16|20))
       DESCRIPTION
          "An implementation is only required to support
```

             IPv4 addresses. Supporting addresses with zone index or IPv6
             addresses are optional."

        GROUP gsmpNotificationObjectsGroup
        DESCRIPTION
             "This group must be supported if notifications
             are supported. "

        GROUP gsmpNotificationsGroup
        DESCRIPTION
             "This group must be supported if notifications
             are supported. "

        ::= { gsmpCompliances 1 }

    -- units of conformance

    gsmpGeneralGroup OBJECT-GROUP
        OBJECTS {
        gsmpSessionVersion,
        gsmpSessionTimer,
        gsmpSessionPartitionId,
        gsmpSessionAdjacencyCount,
        gsmpSessionFarSideName,
        gsmpSessionFarSidePort,
        gsmpSessionFarSideInstance,
        gsmpSessionLastFailureCode,
        gsmpSessionDiscontinuityTime,
        gsmpSessionStartUptime,
        gsmpSessionStatSentMessages,
        gsmpSessionStatFailureInds,
        gsmpSessionStatReceivedMessages,
        gsmpSessionStatReceivedFailures,
        gsmpSessionStatPortUpEvents,
        gsmpSessionStatPortDownEvents,
        gsmpSessionStatInvLabelEvents,
        gsmpSessionStatNewPortEvents,
        gsmpSessionStatDeadPortEvents,
        gsmpSessionStatAdjUpdateEvents
        }
        STATUS current
        DESCRIPTION
             "Objects that apply to all GSMP implementations."
        ::= { gsmpGroups 1 }

    gsmpControllerGroup OBJECT-GROUP
        OBJECTS {
        gsmpControllerMaxVersion,

```
        gsmpControllerTimer,
        gsmpControllerPort,
        gsmpControllerInstance,
        gsmpControllerPartitionType,
        gsmpControllerPartitionId,
        gsmpControllerDoResync,
        gsmpControllerNotificationMap,
        gsmpControllerSessionState,
        gsmpControllerStorageType,
        gsmpControllerRowStatus
        }
    STATUS          current
    DESCRIPTION
          "Objects that apply GSMP implementations of
          Switch Controllers."
    ::= { gsmpGroups 2 }

gsmpSwitchGroup OBJECT-GROUP
    OBJECTS {
        gsmpSwitchMaxVersion,
        gsmpSwitchTimer,
        gsmpSwitchName,
        gsmpSwitchPort,
        gsmpSwitchInstance,
        gsmpSwitchPartitionType,
        gsmpSwitchPartitionId,
        gsmpSwitchNotificationMap,
        gsmpSwitchSwitchType,
        gsmpSwitchWindowSize,
        gsmpSwitchSessionState,
        gsmpSwitchStorageType,
        gsmpSwitchRowStatus
        }
    STATUS          current
    DESCRIPTION
          "Objects that apply GSMP implementations of
          Switches."
    ::= { gsmpGroups 3 }

gsmpAtmEncapGroup OBJECT-GROUP
    OBJECTS {
        gsmpAtmEncapIfIndex,
        gsmpAtmEncapVpi,
        gsmpAtmEncapVci,
        gsmpAtmEncapStorageType,
        gsmpAtmEncapRowStatus
        }
    STATUS          current
```

```
         DESCRIPTION
              "Objects that apply to GSMP implementations that
              supports ATM for GSMP encapsulation."
         ::= { gsmpGroups 4 }

     gsmpTcpIpEncapGroup OBJECT-GROUP
         OBJECTS {
         gsmpTcpIpEncapAddressType,
         gsmpTcpIpEncapAddress,
         gsmpTcpIpEncapPortNumber,
         gsmpTcpIpEncapStorageType,
         gsmpTcpIpEncapRowStatus
         }
         STATUS         current
         DESCRIPTION
              "Objects that apply to GSMP implementations that
              supports TCP/IP for GSMP encapsulation."
         ::= { gsmpGroups 5 }

      gsmpNotificationObjectsGroup OBJECT-GROUP
         OBJECTS {
         gsmpEventPort,
         gsmpEventPortSessionNumber,
         gsmpEventSequenceNumber,
         gsmpEventLabel
         }
         STATUS         current
         DESCRIPTION
              "Objects that are contained in the notifications."
         ::= { gsmpGroups 6 }

     gsmpNotificationsGroup NOTIFICATION-GROUP
         NOTIFICATIONS {
         gsmpSessionDown,
         gsmpSessionUp,
         gsmpSentFailureInd,
         gsmpReceivedFailureInd,
         gsmpPortUpEvent,
         gsmpPortDownEvent,
         gsmpInvalidLabelEvent,
         gsmpNewPortEvent,
         gsmpDeadPortEvent,
         gsmpAdjacencyUpdateEvent
         }
         STATUS current
         DESCRIPTION
              "The notifications which indicate specific changes
              in the value of objects gsmpSessionTable"
```

```
     ::= { gsmpGroups 7 }
```

END

5. Acknowledgments

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7. Intellectual Property Rights

8. Security Considerations

   Assuming that secure network management (such as SNMP v3) is
   implemented, the objects represented in this MIB do not pose a threat
   to the security of the network.

   There are a number of management objects defined in this MIB that
   have 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.

   There are a number of managed objects in this MIB that may contain
   sensitive information. They are contained in the gsmpControllerTable
   and gsmpSwitchTable. It is thus important to control even GET access
   to these objects and possibly to even encrypt the values of these
   object when sending them over the network via SNMP. Not all versions
   of SNMP provide features for such a secure environment.

   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 [RFC2574] and the View-
   based Access Control Model RFC 2575 [RFC2575] 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.

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