                Relational Database Management System (RDBMS)
                Management Information Base (MIB) using SMIv2

Status of this Memo

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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 used for managing
   relational database (RDBMS) implementations.

2. The SNMPv2 Network Management Framework

   The SNMPv2 Network Management Framework consists of four major
   components. They are:

      o RFC 1442 [1] which defines the SMI, the mechanisms used for
        describing and naming objects for the purpose of management.

      o STD 17, RFC 1213 [2] defines MIB-II, the core set of managed
        objects for the Internet suite of protocols.

      o RFC 1445 [3] which defines the administrative and other
        architectural aspects of the framework.

      o RFC 1448 [4] which defines the protocol used for network
        access to managed objects.

      o RFC 1443 [5] which describes textual conventions for the
        framework.

   The framework permits new objects to be defined for the purpose of
   experimentation and evaluation. In particular, the RDBMS-MIB can be
   seen as an extension of

      o RFC 1565 [6] which defines the MIB for monitoring network
        service applications.

2.1. Object Definitions

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

3. Overview

   The RDBMS-MIB contains objects that may be used to manage relational
   database implementations. Specifically, it contains information on
   installed databases, servers, and on the relation of databases and
   servers. The terms used in this database are described below.

3.1. Terminology

     Vendors and Products
          are providers of database systems on a host. These vendors
          may have more than one database product that is manageable
          through this MIB. On a host, there may be systems from
          multiple vendors, multiple systems from a single vendor, or
          any other combination. There may be a private MIB for each
          vendor, and this may be located using the PrivateMibOID
          objects in some of the tables.

     Databases
          are collections of interrelated data organized according to a
          schema to serve one or more applications. A database is, for
          purposes of this MIB, a collection of tables whose
          organization is based on the relational model. There may be
          one or more databases available in each system on the host
          from each product. In the MIB, data about databases is
          captured in the rdbmsDbTable and the rdbmsDbInfoTable, each
          with one row per database.

     Relational Database Management System (RDBMS)
          A collection of integrated services which support database
          management and together support and control the creation, use
          and maintenance of relational databases. Servers as defined
          in this MIB provide the functions of the RDBMS.

     Servers
          are entities that provide access to databases. For this MIB,
          servers are defined to be entities that may exist
          independently of other servers. A server may or may not be a
          single process, based on its independence from other
          processes. In this MIB, information about servers is
          captured in the rdbmsSvrTable, the rdbmsSvrInfoTable, each
          with one row per server extending the applTable from the
          APPLICATION-MIB of RFC 1565. The rdbmsSvrTable and
          rdbmsSvrInfoTable are both indexed by the applIndex of that
          MIB.

     Associations
          Inbound associations are local or remote conversations,
          usually instances of the SQL CONNECT statement, as made
          visible in servers. The MIB does not currently reveal
          individual associations; there are association counters in
          the dbmsSvrInfoTable and the applTable.

     There are also relationships between servers and databases. All
     obvious relationships are possible and supported:

o   1 database : 1 server

o   1 database : many servers

o   many databases : 1 server

o   many databases : many servers

3.2. Structure and Features

   The information in this MIB module is organized into nine tables,
   twelve potentially writable objects, and two traps, as follows.

3.2.1. Tables

   o   databases installed on a host/system (rdbmsDbTable)

   o   actively opened databases (rdbmsDbInfoTable)

   o   database configuration parameters (rdbmsDbParamTable)

   o   database limited resources (rdbmsDbLimitedResourceTable)

   o   database servers installed on a system (rdbmsSrvTable)

   o   active database servers (rdbmsSrvInfoTable)

   o   configuration parameters for a server (rdbmsSrvParamTable)

   o   server limited resources (rdbmsSrvLimitedResourceTable)

   o   relation of servers and databases on a host (rdbmsRelTable)

   These entities have broad applicability among database systems, and
   are enough for many monitoring tasks. They are far from adequate for
   detailed management or performance monitoring of specific database
   products. This gap is expected to be filled with vendor and product
   specific MIBs addressing the entities that have not been codified
   here.

3.2.2. Writable objects

   The MIB requires no writable objects for conformance. There is no
   expectation that RDBMS systems may be actively managed through this
   MIB. However, the RDBMS-MIB supports the capability to modify the
   following objects if the implementor so chooses.

   o   rdbmsDbContact

   o   rdbmsDbInfoSizeAllocated

   o   rdbmsDbParamCurrValue

   o   rdbmsDbParamComment rdbmsDbLimitedResourceLimit

   o   rdbmsDbLimitedResourceDescription

   o   rdbmsSrvContact

   o   rdbmsSrvInfoMaxInboundAssociations

   o   rdbmsSrvParamCurrValue

   o   rdbmsSrvParamComment

   o   rdbmsSrvLimitedResourceLimit

   o   rdbmsSrvLimitedResourceDescription

3.2.3. Traps

   The RDBMS-MIB contains two traps:

   o   rdbmsStateChange

   o   rdbmsOutOfSpace

4. Definitions

   RDBMS-MIB DEFINITIONS ::= BEGIN

   IMPORTS
      MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE,
       Counter32, Gauge32, Integer32
           FROM SNMPv2-SMI
       DisplayString, DateAndTime, AutonomousType
           FROM SNMPv2-TC
       applIndex, applGroup
           FROM APPLICATION-MIB
       mib-2
           FROM RFC1213-MIB;

   rdbmsMIB MODULE-IDENTITY
       LAST-UPDATED "9406150655Z"
       ORGANIZATION "IETF RDBMSMIB Working Group"
       CONTACT-INFO
                "   David Brower

                    Postal: The ASK Group, INGRES DBMS Development
                            1080 Marina Village Parkway
                            Alameda, CA 94501
                            US

                       Tel: +1 510 748 3418
                       Fax: +1 510 748 2770

                    E-mail: daveb@ingres.com"
       DESCRIPTION
           "The MIB module to describe objects for generic relational
            databases."

       ::= { mib-2 39 }

   rdbmsObjects   OBJECT IDENTIFIER ::= { rdbmsMIB 1 }

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   rdbmsDbTable   OBJECT-TYPE
       SYNTAX   SEQUENCE OF RdbmsDbEntry
       MAX-ACCESS not-accessible
       STATUS   current
       DESCRIPTION
           "The table of databases installed on a system."
       ::= { rdbmsObjects 1 }

```
rdbmsDbEntry       OBJECT-TYPE
    SYNTAX        RdbmsDbEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        "An entry for a single database on the host.  Whether a
         particular database is represented by a row in rdbmsDbTable
         may be dependent on the activity level of that database,
         according to the product's implementation.  An instance of
         rdbmsRelState having the value active, other, or restricted
         implies that an entry, corresponding to that instance, will
         be present."
    INDEX  { rdbmsDbIndex }
    ::= { rdbmsDbTable 1 }

RdbmsDbEntry     ::=
    SEQUENCE {
        rdbmsDbIndex             INTEGER,
        rdbmsDbPrivateMibOID       OBJECT IDENTIFIER,
        rdbmsDbVendorName        DisplayString,
        rdbmsDbName              DisplayString,
        rdbmsDbContact           DisplayString
    }

rdbmsDbIndex         OBJECT-TYPE
    SYNTAX           INTEGER (1..2147483647)
    MAX-ACCESS       not-accessible
    STATUS           current
    DESCRIPTION
        "A numeric index, unique among all the databases from all
         products on this host.  This value is a surrogate for the
         conceptually unique key, which is {PrivateMibOID,
         databasename}"
    ::= { rdbmsDbEntry  1 }

rdbmsDbPrivateMibOID    OBJECT-TYPE
    SYNTAX           OBJECT IDENTIFIER
    MAX-ACCESS       read-only
    STATUS           current
    DESCRIPTION
       "The authoritative identification for the private MIB for
        this database, presumably based on the vendor, e.g., {
        enterprises 111 <optional subidentifiers>} for Oracle
        databases, {enterprises 757 <optional subidentifiers>} for
        Ingres databases, { enterprises 897 <optional
        subidentifiers>} for Sybase databases, etc.

        If no OBJECT IDENTIFIER exists for the private MIB, attempts
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        to access this object will return noSuchName (SNMPv1)
        or noSuchInstance (SNMPv2)."
   ::= { rdbmsDbEntry  2 }

 rdbmsDbVendorName    OBJECT-TYPE
     SYNTAX          DisplayString
     MAX-ACCESS      read-only
     STATUS          current
     DESCRIPTION
        "The name of the vendor whose RDBMS manages this database,
         for informational purposes."
   ::= { rdbmsDbEntry 3 }

 rdbmsDbName       OBJECT-TYPE
     SYNTAX       DisplayString
     MAX-ACCESS   read-only
     STATUS       current
     DESCRIPTION
        "The name of this database, in a product specific format.  The
         product may need to qualify the name in some way to resolve
         conflicts if it is possible for a database name to be
         duplicated on a host.  It might be necessary to construct a
         hierarchical name embedding the RDBMS instance/installation
         on the host, and/or the owner of the database.  For instance,
         '/test-installation/database-owner/database-name'."
   ::= { rdbmsDbEntry 4 }

 rdbmsDbContact   OBJECT-TYPE
     SYNTAX       DisplayString
     MAX-ACCESS   read-write
     STATUS       current
     DESCRIPTION
        "The textual identification of the contact person for this
         managed database, together with information on how to contact
         this person.

         Note: if there is no server associated with this database, an
         agent may need to keep this in other persistent storage,
         e.g., a configuration file.

         Note that a compliant agent does not need to
         allow write access to this object."

   ::= { rdbmsDbEntry 5 }
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rdbmsDbInfoTable      OBJECT-TYPE
    SYNTAX            SEQUENCE OF RdbmsDbInfoEntry
    MAX-ACCESS        not-accessible
    STATUS            current
    DESCRIPTION
        "The table of additional information about databases present
         on the host."
    ::= { rdbmsObjects 2 }

rdbmsDbInfoEntry      OBJECT-TYPE
    SYNTAX            RdbmsDbInfoEntry
    MAX-ACCESS        not-accessible
    STATUS            current
    DESCRIPTION
        "Information that must be present if the database is actively
         opened.  If the database is not actively opened, then
         attempts to access corresponding instances in this table may
         result in either noSuchName (SNMPv1) or noSuchInstance
         (SNMPv2).  'Actively opened' means at least one of the
         rdbmsRelState entries for this database in the rdbmsRelTable
         is active(2)."
    INDEX  { rdbmsDbIndex }
    ::= { rdbmsDbInfoTable 1 }

RdbmsDbInfoEntry ::=
    SEQUENCE {
        rdbmsDbInfoProductName      DisplayString,
        rdbmsDbInfoVersion          DisplayString,
        rdbmsDbInfoSizeUnits        INTEGER,
        rdbmsDbInfoSizeAllocated    INTEGER,
        rdbmsDbInfoSizeUsed         INTEGER,
        rdbmsDbInfoLastBackup       DateAndTime
    }

rdbmsDbInfoProductName  OBJECT-TYPE
    SYNTAX            DisplayString
    MAX-ACCESS        read-only
    STATUS            current
    DESCRIPTION
        "The textual product name of the server that created or last
         restructured this database.  The format is product specific."
    ::= { rdbmsDbInfoEntry 1 }

rdbmsDbInfoVersion  OBJECT-TYPE
    SYNTAX            DisplayString
    MAX-ACCESS        read-only
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      STATUS            current
      DESCRIPTION
          "The version number of the server that created or last
           restructured this database.  The format is product specific."
      ::= { rdbmsDbInfoEntry 2 }

  rdbmsDbInfoSizeUnits      OBJECT-TYPE
      SYNTAX                INTEGER {
                                bytes(1),
                                kbytes(2),
                                mbytes(3),
                                gbytes(4),
                                tbytes(5)
                                }
      MAX-ACCESS            read-only
      STATUS                current
      DESCRIPTION
          "Identification of the units used to measure the size of this
           database in rdbmsDbInfoSizeAllocated and rdbmsDbInfoSizeUsed.
           bytes(1) indicates individual bytes, kbytes(2) indicates
           units of kilobytes, mbytes(3) indicates units of megabytes,
           gbytes(4) indicates units of gigabytes, and tbytes(5)
           indicates units of terabytes.  All are binary multiples -- 1K
           = 1024.  If writable, changes here are reflected in the get
           values of the associated objects."

      ::= { rdbmsDbInfoEntry 3 }

  rdbmsDbInfoSizeAllocated   OBJECT-TYPE
      SYNTAX                INTEGER (1..2147483647)
      MAX-ACCESS            read-write
      STATUS                current
      DESCRIPTION
          "The estimated size of this database (in
           rdbmsDbInfoSizeUnits), which is the disk space that has been
           allocated to it and is no longer available to users on this
           host.  rdbmsDbInfoSize does not necessarily indicate the
           amount of space actually in use for database data.  Some
           databases may support extending allocated size, and others
           may not.

           Note that a compliant agent does not need to
           allow write access to this object."

  --        Note:  computing SizeAllocated may be expensive, and SNMP
  --        agents might cache the value to increase performance.

      ::= { rdbmsDbInfoEntry 4 }
```

```
rdbmsDbInfoSizeUsed      OBJECT-TYPE
    SYNTAX               INTEGER (1..2147483647)
    MAX-ACCESS           read-only
    STATUS               current
    DESCRIPTION
        "The estimated size of this database, in rdbmsDbInfoSizeUnits,
         which is actually in use for database data."

--       Note:  computing SizeUsed may be expensive, and SNMP
--       agents might cache the value to increase performance.
    ::= { rdbmsDbInfoEntry 5 }


rdbmsDbInfoLastBackup       OBJECT-TYPE
    SYNTAX                  DateAndTime
    MAX-ACCESS              read-only
    STATUS                  current
    DESCRIPTION
        "The date and time that the latest complete or partial backup
         of the database was taken. If a database has never been
         backed up, then attempts to access this object will
         result in either noSuchName (SNMPv1) or noSuchInstance
         (SNMPv2)."
     ::= { rdbmsDbInfoEntry 6 }


----------------------------------------------------------------


rdbmsDbParamTable        OBJECT-TYPE
    SYNTAX               SEQUENCE OF RdbmsDbParamEntry
    MAX-ACCESS           not-accessible
    STATUS               current
    DESCRIPTION
        "The table of configuration parameters for a database.
         Entries should be populated according to the following
         guidelines:
         (1) The value should be specified through administrative
             (human) intervention.
         (2) It should be configured on a per-database basis.
         (3) One of the following is true:
             (a) The parameter has a non-numeric value;
             (b) The current value is numeric, but it only changes due
                 to human intervention;
             (c) The current value is numeric and dynamic, but the
                 RDBMS does not track access/allocation failures
                 related to the parameter;
             (d) The current value is numeric and dynamic, the
                 RDBMS tracks changes in access/allocation failures
                 related to the parameter, but the failure has no
                 significant impact on RDBMS performance or
```

                        availability.
                    (e) The current value is numeric and dynamic, the
                        RDBMS tracks changes in access/allocation failures
                        related to the parameter, the failure has
                        significant impact on RDBMS performance or
                        availability, and is shown in the
                        rdbmsDbLimitedResource table."
        ::= { rdbmsObjects 3 }

   rdbmsDbParamEntry   OBJECT-TYPE
        SYNTAX   RdbmsDbParamEntry
        MAX-ACCESS   not-accessible
        STATUS   current
        DESCRIPTION
            "An entry for a single configuration parameter for a database.
            Parameters with single values have a subindex value of one.
            If the parameter is naturally considered to contain a
            variable number of members of a class, e.g. members of the
            DBA user group, or files which are part of the database, then
            it must be presented as a set of rows. If, on the other
            hand, the parameter represents a set of choices from a class,
            e.g. the permissions on a file or the options chosen out of
            the set of all options allowed, AND is guaranteed to always
            fit in the 255 character length of a DisplayString, then it
            may be presented as a comma separated list with a subindex
            value of one. Zero may not be used as a subindex value.

            If the database is not actively opened, then attempts
            to access corresponding instances in this table may result in
            either noSuchName (SNMPv1) or noSuchInstance (SNMPv2).
            'Actively opened' means at least one of the
            rdbmsRelState entries for this database in the rdbmsRelTable
            is active(2)."
        INDEX { rdbmsDbIndex, rdbmsDbParamName, rdbmsDbParamSubIndex }
        ::= { rdbmsDbParamTable 1 }

   RdbmsDbParamEntry ::=
        SEQUENCE {
            rdbmsDbParamName   DisplayString,
            rdbmsDbParamSubIndex   INTEGER,
            rdbmsDbParamID   AutonomousType,
            rdbmsDbParamCurrValue   DisplayString,
            rdbmsDbParamComment   DisplayString
        }

   rdbmsDbParamName   OBJECT-TYPE
        SYNTAX   DisplayString (SIZE (1..64))
        MAX-ACCESS   not-accessible

```
        STATUS              current
        DESCRIPTION
            "The name of a configuration parameter for a database.  This
             name is product-specific.  The length is limited to 64
             characters to constrain the number of sub-identifiers needed
             for instance identification (and to minimize network
             traffic)."

        ::= { rdbmsDbParamEntry 1 }

    rdbmsDbParamSubIndex    OBJECT-TYPE
        SYNTAX              INTEGER (1..2147483647)
        MAX-ACCESS          not-accessible
        STATUS              current
        DESCRIPTION
            "The subindex value for this parameter.  If the parameter is
             naturally considered to contain a variable number of members
             of a class, e.g.  members of the DBA user group, or files
             which are part of the database, then it must be presented as
             a set of rows.  If, on the other hand, the parameter
             represents a set of choices from a class, e.g. the
             permissions on a file or the options chosen out of the set of
             all options allowed, AND is guaranteed to always fit in the
             255 character length of a DisplayString, then it may be
             presented as a comma separated list with a subindex value of
             one.  Zero may not be used as a value."
        ::= { rdbmsDbParamEntry 2 }

    rdbmsDbParamID          OBJECT-TYPE
        SYNTAX              AutonomousType
        MAX-ACCESS          read-only
        STATUS              current
        DESCRIPTION
            "The ID of the parameter which may be described in some other
             MIB (e.g., an enterprise-specific MIB module).  If there is
             no ID for this rdbmsDbParamName, attempts to access this
             object will return noSuchName (SNMPv1) or noSuchInstance
             (SNMPv2)."
        ::= { rdbmsDbParamEntry 3 }

    rdbmsDbParamCurrValue OBJECT-TYPE
        SYNTAX              DisplayString
        MAX-ACCESS          read-write
        STATUS              current
        DESCRIPTION
            "The value for a configuration parameter now in effect, the
             actual setting for the database.  While there may multiple
             values in the temporal domain of interest (for instance, the
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         value to take effect at the next restart), this is the
         current setting.

         Note that a compliant agent does not need to
         allow write access to this object."

     ::= { rdbmsDbParamEntry 4 }

  rdbmsDbParamComment   OBJECT-TYPE
     SYNTAX   DisplayString
     MAX-ACCESS   read-write
     STATUS   current
     DESCRIPTION
         "Annotation which describes the purpose of a configuration
          parameter or the reason for a particular parameter's
          setting.

          Note that a compliant agent does not need to
          allow write access to this object."

     ::= { rdbmsDbParamEntry 5 }

     ----

  rdbmsDbLimitedResourceTable   OBJECT-TYPE
     SYNTAX   SEQUENCE OF RdbmsDbLimitedResourceEntry
     MAX-ACCESS   not-accessible
     STATUS   current
     DESCRIPTION
         "The table of limited resources that are kept per-database."
     ::= { rdbmsObjects 4 }

  rdbmsDbLimitedResourceEntry   OBJECT-TYPE
     SYNTAX   RdbmsDbLimitedResourceEntry
     MAX-ACCESS   not-accessible
     STATUS   current
     DESCRIPTION
         "An entry for a single limited resource kept per-database.
          A limited resource has maximum use determined by a parameter
          that might or might not be changeable at run time, or visible
          in the rdbmsDbParamTable. Examples would be the number of
          available locks, or disk space on a partition. Arrays of
          resources are supported through an integer sub index, which
          should have the value of one for single-instance names.

          Limited resources that are shared across databases, are best
          put in the rdbmsSvrLimitedResourceTable instead of this one.

          If the database is not actively opened, then attempts to
          access corresponding instances in this table may result in
          either noSuchName (SNMPv1) or noSuchInstance (SNMPv2).
          'Actively opened' means at least one of the rdbmsRelState
          entries for this database in the rdbmsRelTable is active(2)."

      INDEX { rdbmsDbIndex, rdbmsDbLimitedResourceName }
      ::= { rdbmsDbLimitedResourceTable 1 }

  RdbmsDbLimitedResourceEntry ::=
      SEQUENCE {
          rdbmsDbLimitedResourceName   DisplayString,
          rdbmsDbLimitedResourceID   AutonomousType,
          rdbmsDbLimitedResourceLimit   INTEGER,
          rdbmsDbLimitedResourceCurrent   INTEGER,
          rdbmsDbLimitedResourceHighwater   INTEGER,
          rdbmsDbLimitedResourceFailures   Counter32,
          rdbmsDbLimitedResourceDescription   DisplayString
      }

  rdbmsDbLimitedResourceName   OBJECT-TYPE
      SYNTAX   DisplayString
      MAX-ACCESS   not-accessible
      STATUS   current
      DESCRIPTION
          "The name of the resource, for instance 'global locks' or
          'locks for the FOO database', or 'data space on /dev/rdsk/5s0
          for FOO'. The length is limited to 64 characters to constrain
          the number of sub-identifiers needed for instance
          identification (and to minimize network traffic)."
      ::= { rdbmsDbLimitedResourceEntry 1 }

  rdbmsDbLimitedResourceID OBJECT-TYPE
      SYNTAX   AutonomousType
      MAX-ACCESS   read-only
      STATUS   current
      DESCRIPTION
          "The ID of the resource which may be described in some other
          MIB (e.g., an enterprise-specific MIB module). If there is
          no ID for this rdbmsDbLimitedResourceName, attempts to access
          this object will return noSuchName (SNMPv1) or noSuchInstance
          (SNMPv2)."
      ::= { rdbmsDbLimitedResourceEntry 2 }

  rdbmsDbLimitedResourceLimit   OBJECT-TYPE
      SYNTAX   INTEGER (1..2147483647)
      MAX-ACCESS   read-write
      STATUS   current

        DESCRIPTION
            "The maximum value the resource use may attain.

             Note that a compliant agent does not need to
             allow write access to this object."

        ::= { rdbmsDbLimitedResourceEntry 3 }

    rdbmsDbLimitedResourceCurrent   OBJECT-TYPE
        SYNTAX   INTEGER (1..2147483647)
        MAX-ACCESS   read-only
        STATUS   current
        DESCRIPTION
            "The current value for the resource."
        ::= { rdbmsDbLimitedResourceEntry 4 }

    rdbmsDbLimitedResourceHighwater   OBJECT-TYPE
        SYNTAX   INTEGER (1..2147483647)
        MAX-ACCESS   read-only
        STATUS   current
        DESCRIPTION
            "The maximum value of the resource seen since applUpTime
             was reset for the earliest server which has the database
             actively opened.

             If there are two servers with the database open, and the
             oldest one dies, the proper way to invalidate the value is by
             resetting sysUpTime."
        ::= { rdbmsDbLimitedResourceEntry 5 }

    rdbmsDbLimitedResourceFailures   OBJECT-TYPE
        SYNTAX   Counter32
        MAX-ACCESS   read-only
        STATUS   current
        DESCRIPTION
            "The number of times the system wanted to exceed the limit of
             the resource since applUpTime was reset for the earliest
             server which has the database actively opened.

             If there are two servers with the DB open, and the
             oldest one dies, the proper way to invalidate the value is by
             resetting sysUpTime."
        ::= { rdbmsDbLimitedResourceEntry 6 }

    rdbmsDbLimitedResourceDescription   OBJECT-TYPE
        SYNTAX   DisplayString
        MAX-ACCESS   read-write
        STATUS   current

            DESCRIPTION
                "A description of the resource and the meaning of the integer
                 units used for Limit, Current, and Highwater.

                 Note that a compliant agent does not need to
                 allow write access to this object."

            ::= { rdbmsDbLimitedResourceEntry 7 }

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    rdbmsSrvTable   OBJECT-TYPE
        SYNTAX   SEQUENCE OF RdbmsSrvEntry
        MAX-ACCESS   not-accessible
        STATUS   current
        DESCRIPTION
            "The table of database servers running or installed
             on a system."
        ::= { rdbmsObjects 5 }

    rdbmsSrvEntry   OBJECT-TYPE
        SYNTAX   RdbmsSrvEntry
        MAX-ACCESS not-accessible
        STATUS   current
        DESCRIPTION
            "An entry for a single database server. A server is an
             independent entity that provides access to one or more
             databases. Failure of one does not affect access to
             databases through any other servers. There might be one or
             more servers providing access to a database. A server may be
             a 'process' or collection of 'processes', as interpreted by
             the product."
        INDEX { applIndex }
        ::= { rdbmsSrvTable 1 }

    RdbmsSrvEntry ::=
        SEQUENCE {
            rdbmsSrvPrivateMibOID   OBJECT IDENTIFIER,
            rdbmsSrvVendorName DisplayString,
            rdbmsSrvProductName DisplayString,
            rdbmsSrvContact   DisplayString
        }

    rdbmsSrvPrivateMibOID   OBJECT-TYPE
        SYNTAX   OBJECT IDENTIFIER
        MAX-ACCESS   read-only
        STATUS   current
        DESCRIPTION

```
          "The authoritative identification for the private MIB for this
           server, presumably based on the vendor, e.g., { enterprises
           111 <optional subidentifiers>} for Oracle servers, {
           enterprises 757 <optional subidentifiers>} for Ingres
           servers, { enterprises 897 <optional subidentifiers>} for
           Sybase servers, etc.

           If no OBJECT IDENTIFIER exists for the private MIB, attempts
           to access this object will return noSuchName (SNMPv1)
           or noSuchInstance (SNMPv2)."
      ::= { rdbmsSrvEntry  1 }

    rdbmsSrvVendorName   OBJECT-TYPE
        SYNTAX           DisplayString
        MAX-ACCESS       read-only
        STATUS           current
        DESCRIPTION
           "The name of the vendor whose RDBMS manages this database,
            for informational purposes."
        ::= { rdbmsSrvEntry 2 }

    rdbmsSrvProductName   OBJECT-TYPE
        SYNTAX           DisplayString
        MAX-ACCESS       read-only
        STATUS           current
        DESCRIPTION
           "The product name of this server.  This is normally the
            vendor's formal name for the product, in product specific
            format."
        ::= { rdbmsSrvEntry 3 }

    rdbmsSrvContact OBJECT-TYPE
        SYNTAX       DisplayString
        MAX-ACCESS   read-write
        STATUS       current
        DESCRIPTION
           "The textual identification of the contact person for this
            managed server, together with information on how to contact
            this person.

            Note: if there is no active server associated with this
            object, an agent may need to keep this in other persistent
            storage, e.g., a configuration file.

            Note that a compliant agent does not need to
            allow write access to this object."

        ::= { rdbmsSrvEntry 4 }
```

     ----

    rdbmsSrvInfoTable   OBJECT-TYPE
        SYNTAX   SEQUENCE OF RdbmsSrvInfoEntry
        MAX-ACCESS   not-accessible
        STATUS   current
        DESCRIPTION
            "The table of additional information about database servers.

            Entries in this table correspond to applications in the
            APPLICATION-MIB applTable. Some objects in that table are
            application-specific. When they are associated with an RDBMS
            server in this table, the objects have the following
            meanings.

            applName - The name of this server, i.e., the process or
            group of processes providing access to this database. The
            exact format will be product and host specific.

            applVersion - The version number of this server, in product
            specific format.

            applOperStatus - up(1) means operational and available for
            general use. down(2) means the server is not available for
            use, but is known to the agent. The other states have broad
            meaning, and may need to be supplemented by the vendor
            private MIB. Halted(3) implies an administrative state of
            unavailability. Congested(4) implies a resource or or
            administrative limit is prohibiting new inbound associations.
            The 'available soon' description of restarting(5) may include
            an indeterminate amount of recovery.

            applLastChange is the time the agent noticed the most recent
            change to applOperStatus.

            applInboundAssociation is the number of currently active
            local and remote conversations (usually SQL connects).

            applOutboundAssociations is not provided by this MIB.

            applAccumulatedInboundAssociations is the total number of
            local and remote conversations started since the server came
            up.

            applAccumulatedOutbound associations is not provided by this
            MIB.

            applLastInboundActivity is the time the most recent local or

          remote conversation was attempted or disconnected.

          applLastOutboundActivity is not provided by this MIB.

          applRejectedInboundAssociations is the number of local or
          remote conversations rejected by the server for
          administrative reasons or because of resource limitations.

          applFailedOutboundAssociations is not provided by this MIB."

     ::= { rdbmsObjects 6 }

  rdbmsSrvInfoEntry   OBJECT-TYPE
      SYNTAX   RdbmsSrvInfoEntry
      MAX-ACCESS   not-accessible
      STATUS   current
      DESCRIPTION
          "Information that must be present for a single 'up' database
          server, with visibility determined by the value of the
          corresponding applOperStatus object. If an instance of
          applOperStatus is not up(1), then attempts to access
          corresponding instances in this table may result in either
          noSuchName (SNMPv1) or noSuchInstance (SNMPv2) being returned
          by the agent."
      INDEX { applIndex }
      ::= { rdbmsSrvInfoTable 1 }

  RdbmsSrvInfoEntry ::=
      SEQUENCE {
          rdbmsSrvInfoStartupTime   DateAndTime,
          rdbmsSrvInfoFinishedTransactions   Gauge32,
          rdbmsSrvInfoDiskReads   Counter32,
          rdbmsSrvInfoDiskWrites   Counter32,
          rdbmsSrvInfoLogicalReads   Counter32,
          rdbmsSrvInfoLogicalWrites   Counter32,
          rdbmsSrvInfoPageWrites   Counter32,
          rdbmsSrvInfoPageReads   Counter32,
          rdbmsSrvInfoDiskOutOfSpaces   Counter32,
          rdbmsSrvInfoHandledRequests   Counter32,
          rdbmsSrvInfoRequestRecvs   Counter32,
          rdbmsSrvInfoRequestSends   Counter32,
          rdbmsSrvInfoHighwaterInboundAssociations   Gauge32,
          rdbmsSrvInfoMaxInboundAssociations   Gauge32
      }

  rdbmsSrvInfoStartupTime OBJECT-TYPE
      SYNTAX   DateAndTime
      MAX-ACCESS   read-only

```
                    STATUS              current
                    DESCRIPTION
                        "The date and time at which this server was last started."
                    ::= { rdbmsSrvInfoEntry 1 }

  rdbmsSrvInfoFinishedTransactions  OBJECT-TYPE
                    SYNTAX              Gauge32
                    MAX-ACCESS          read-only
                    STATUS              current
                    DESCRIPTION
                        "The number of transactions visible to this server that have
                         been completed by either commit or abort.  Some database
                         operations, such as read-only queries, may not result in the
                         creation of a transaction."
                    ::= { rdbmsSrvInfoEntry 2 }

  rdbmsSrvInfoDiskReads  OBJECT-TYPE
                    SYNTAX              Counter32
                    MAX-ACCESS          read-only
                    STATUS              current
                    DESCRIPTION
                        "The total number of reads of database files issued to the
                         operating system by this server since startup.  Numbers are
                         not comparable between products.  What constitutes a
                         readand how it is accounted is product-specific."
                    ::= { rdbmsSrvInfoEntry 3 }

  rdbmsSrvInfoLogicalReads  OBJECT-TYPE
                    SYNTAX              Counter32
                    MAX-ACCESS          read-only
                    STATUS              current
                    DESCRIPTION
                        "The total number of logical reads of database files made
                         internally by this server since startup.  The values of this
                         object and those of rdbmsSrvInfoDiskReads reveal the effect
                         of caching on read operation. Numbers are not comparable
                         between products, and may only be meaningful when aggregated
                         across all servers sharing a common cache."
                    ::= { rdbmsSrvInfoEntry 4 }

  rdbmsSrvInfoDiskWrites  OBJECT-TYPE
                    SYNTAX              Counter32
                    MAX-ACCESS          read-only
                    STATUS              current
                    DESCRIPTION
                        "The total number of writes to database files issued to the
                         operating system by this server since startup.  Numbers are
                         not comparable between products."
```

```
    ::= { rdbmsSrvInfoEntry 5 }

rdbmsSrvInfoLogicalWrites  OBJECT-TYPE
    SYNTAX              Counter32
    MAX-ACCESS          read-only
    STATUS              current
    DESCRIPTION
        "The total number of times parts of the database files have
        been marked 'dirty' and in need of writing to the disk.  This
        value and rdbmsSrvInfoDiskWrites give some indication of the
        effect of 'write-behind' strategies in reducing the number of
        disk writes compared to database operations.  Because the
        writes may be done by servers other than those marking the
        parts of the database files dirty, these values may only be
        meaningful when aggregated across all servers sharing a
        common cache.  Numbers are not comparable between products."
    ::= { rdbmsSrvInfoEntry 6 }

rdbmsSrvInfoPageReads   OBJECT-TYPE
    SYNTAX              Counter32
    MAX-ACCESS          read-only
    STATUS              current
    DESCRIPTION
        "The total number of pages in database files read by this
        server since startup.  'Pages' are product specific units of
        disk i/o operations.  This value, along with
        rdbmsSrvInfoDiskReads, reveals the effect of any grouping
        read-ahead that may be used to enhance performance of some
        queries, such as scans."
    ::= { rdbmsSrvInfoEntry 7}

rdbmsSrvInfoPageWrites   OBJECT-TYPE
    SYNTAX              Counter32
    MAX-ACCESS          read-only
    STATUS              current
    DESCRIPTION
        "The total number of pages in database files written by this
        server since startup.  Pages are product-specific units of
        disk I/O.  This value, with rdbmsSrvInfoDiskWrites, shows the
        effect of write strategies that collapse logical writes of
        contiguous pages into single calls to the operating system."
    ::= { rdbmsSrvInfoEntry 8 }

rdbmsSrvInfoDiskOutOfSpaces OBJECT-TYPE
    SYNTAX                  Counter32
    MAX-ACCESS              read-only
    STATUS                  current
    DESCRIPTION
```

```
            "The total number of times the server has been unable to
             obtain disk space that it wanted, since server startup.  This
             would be inspected by an agent on receipt of an
             rdbmsOutOfSpace trap."
        ::= { rdbmsSrvInfoEntry 9 }

  rdbmsSrvInfoHandledRequests    OBJECT-TYPE
        SYNTAX              Counter32
        MAX-ACCESS          read-only
        STATUS              current
        DESCRIPTION
            "The total number of requests made to the server on inbound
             associations.  The meaning of 'requests' is product specific,
             and is not comparable between products.

             This is intended to encapsulate high level semantic
             operations between clients and servers, or between peers.
             For instance, one request might correspond to a 'select' or
             an 'insert' statement.  It is not intended to capture disk
             i/o described in rdbmsSrvInfoDiskReads and
             rdbmsSrvInfoDiskWrites."
        ::= { rdbmsSrvInfoEntry 10 }

  rdbmsSrvInfoRequestRecvs       OBJECT-TYPE
        SYNTAX              Counter32
        MAX-ACCESS          read-only
        STATUS              current
        DESCRIPTION
            "The number of receive operations made processing any requests
             on inbound associations. The meaning of operations is product
             specific, and is not comparable between products.

             This is intended to capture lower-level i/o operations than
             shown by HandledRequests, between clients and servers, or
             between peers.  For instance, it might roughly correspond to
             the amount of data given with an 'insert' statement.  It is
             not intended to capture disk i/o described in
             rdbmsSrvInfoDiskReads and rdbmsSrvInfoDiskWrites."
        ::= { rdbmsSrvInfoEntry 11 }

  rdbmsSrvInfoRequestSends       OBJECT-TYPE
        SYNTAX              Counter32
        MAX-ACCESS          read-only
        STATUS              current
        DESCRIPTION
            "The number of send operations made processing requests
             handled on inbound associations.  The meaning of operations
             is product specific, and is not comparable between products.
```

```
        This is intended to capture lower-level i/o operations than
        shown by HandledRequests, between between clients and
        servers, or between peers.  It might roughly correspond to
        the number of rows returned by a 'select' statement.  It is
        not intended to capture disk i/o described in DiskReads."
     ::= { rdbmsSrvInfoEntry 12 }


  rdbmsSrvInfoHighwaterInboundAssociations  OBJECT-TYPE
     SYNTAX              Gauge32
     MAX-ACCESS          read-only
     STATUS              current
     DESCRIPTION
         "The greatest number of inbound associations that have been
          simultaneously open to this server since startup."
     ::= { rdbmsSrvInfoEntry 13 }


  rdbmsSrvInfoMaxInboundAssociations OBJECT-TYPE
     SYNTAX              Gauge32
     MAX-ACCESS          read-write
     STATUS              current
     DESCRIPTION
         "The greatest number of inbound associations that can be
          simultaneously open with this server.  If there is no limit,
          then the value should be zero.

          Note that a compliant agent does not need to
          allow write access to this object."

     ::= { rdbmsSrvInfoEntry 14 }


     ----------------------------------------------------------------


  rdbmsSrvParamTable         OBJECT-TYPE
     SYNTAX              SEQUENCE OF RdbmsSrvParamEntry
     MAX-ACCESS          not-accessible
     STATUS              current
     DESCRIPTION
         "The table of configuration parameters for a server.  Entries
          should be populated according to the following guidelines:
          (1) The value should be specified through administrative
              (human) intervention.
          (2) It should be configured on a per-server or a more global
              basis, with duplicate entries for each server sharing
              use of the parameter.
          (3) One of the following is true:
              (a) The parameter has a non-numeric value;
              (b) The current value is numeric, but it only changes due
                  to human intervention;
```

                    (c) The current value is numeric and dynamic, but the
                        RDBMS does not track access/allocation failures
                        related to the parameter;
                    (d) The current value is numeric and dynamic, the
                        RDBMS tracks changes in access/allocation failures
                        related to the parameter, but the failure has no
                        significant impact on RDBMS performance or
                        availability.
                    (e) The current value is numeric and dynamic, the
                        RDBMS tracks changes in access/allocation failures
                        related to the parameter, the failure has
                        significant impact on RDBMS performance or
                        availability, and is shown in the
                        rdbmsSrvLimitedResource table."
            ::= { rdbmsObjects 7 }

  rdbmsSrvParamEntry   OBJECT-TYPE
        SYNTAX   RdbmsSrvParamEntry
        MAX-ACCESS   not-accessible
        STATUS   current
        DESCRIPTION
            "An entry for a single configuration parameter for a server.
            Parameters with single values have a subindex value of one.
            If the parameter is naturally considered to contain a
            variable number of members of a class, e.g. members of the
            DBA user group, or tracepoints active in the server, then it
            must be presented as a set of rows. If, on the other hand,
            the parameter represents a set of choices from a class,
            e.g. the permissions on a file or the options chosen out of
            the set of all options allowed, AND is guaranteed to always
            fit in the 255 character length of a DisplayString, then it
            may be presented as a comma separated list with a subindex
            value of one. Zero may not be used as a subindex value.

            Entries for a server must be present if the value of the
            corresponding applOperStatus object is up(1). If an instance
            of applOperStatus is not up(1), then attempts to access
            corresponding instances in this table may result in either
            noSuchName (SNMPv1) or noSuchInstance (SNMPv2) being returned
            by the agent."
        INDEX { applIndex, rdbmsSrvParamName, rdbmsSrvParamSubIndex }
        ::= { rdbmsSrvParamTable 1 }

  RdbmsSrvParamEntry ::=
        SEQUENCE {
            rdbmsSrvParamName   DisplayString,
            rdbmsSrvParamSubIndex   INTEGER,
            rdbmsSrvParamID   AutonomousType,

```
                    rdbmsSrvParamCurrValue       DisplayString,
                    rdbmsSrvParamComment         DisplayString
            }

      rdbmsSrvParamName          OBJECT-TYPE
          SYNTAX                 DisplayString (SIZE (1..64))
          MAX-ACCESS             not-accessible
          STATUS                 current
          DESCRIPTION
              "The name of a configuration parameter for a server.  This
               name is product-specific. The length is limited to 64
               characters to constrain the number of sub-identifiers needed
               for instance identification (and to minimize network
               traffic)."
          ::= { rdbmsSrvParamEntry 1 }

      rdbmsSrvParamSubIndex      OBJECT-TYPE
          SYNTAX                 INTEGER (1..2147483647)
          MAX-ACCESS             not-accessible
          STATUS                 current
          DESCRIPTION
              "The subindex value for this parameter.  If the parameter is
               naturally considered to contain a variable number of members
               of a class, e.g.  members of the DBA user group, or files
               which are part of the database, then it must be presented as
               a set of rows.  If, on the other hand, the parameter
               represents a set of choices from a class, e.g. the
               permissions on a file or the options chosen out of the set of
               all options allowed, AND is guaranteed to always fit in the
               255 character length of a DisplayString, then it may be
               presented as a comma separated list with a subindex value of
               one.  Zero may not be used as a value."
          ::= { rdbmsSrvParamEntry 2 }

     rdbmsSrvParamID             OBJECT-TYPE
          SYNTAX                 AutonomousType
          MAX-ACCESS             read-only
          STATUS                 current
          DESCRIPTION
              "The ID of the parameter which may be described in some
               other MIB.  If there is no ID for this rdbmsSrvParamName,
               attempts to access this object will return noSuchName
               (SNMPv1) or noSuchInstance (SNMPv2)."
          ::= { rdbmsSrvParamEntry 3 }

     rdbmsSrvParamCurrValue      OBJECT-TYPE
          SYNTAX                 DisplayString
          MAX-ACCESS             read-write
```

```
        STATUS              current
        DESCRIPTION
            "The value for a configuration parameter now in effect, the
             actual setting for the server.  While there may multiple
             values in the temporal domain of interest (for instance, the
             value to take effect at the next restart), this is the
             current setting.

             Note that a compliant agent does not need to
             allow write access to this object."

        ::= { rdbmsSrvParamEntry 4 }

  rdbmsSrvParamComment    OBJECT-TYPE
        SYNTAX              DisplayString
        MAX-ACCESS          read-write
        STATUS              current
        DESCRIPTION
            "Annotation which describes the purpose of a configuration
             parameter or the reason for a particular parameter's
             setting.

             Note that a compliant agent does not need to
             allow write access to this object."

        ::= { rdbmsSrvParamEntry 5 }


    -----------------------------------------------------------------


  rdbmsSrvLimitedResourceTable        OBJECT-TYPE
        SYNTAX          SEQUENCE OF RdbmsSrvLimitedResourceEntry
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
            "The table of limited resources relevant to a server."
        ::= { rdbmsObjects 8 }

  rdbmsSrvLimitedResourceEntry    OBJECT-TYPE
        SYNTAX      RdbmsSrvLimitedResourceEntry
        MAX-ACCESS  not-accessible
        STATUS      current
        DESCRIPTION
            "An entry for a single limited resource kept by the server.
             A limited resource has maximum use determined by a parameter
             that might or might not changeable at run time, or visible in
             the rbmsSrvParamTable.  Examples would be the number of
             available locks, or number of concurrent executions allowed
             in a server.  Arrays of resources are supported through an
```

```
             integer subindex, which should have the value of one for
             single-instance names.

             Limited resources that are shared across servers or databases
             are best duplicated in this table across
             all servers accessing the resource."
        INDEX { applIndex, rdbmsSrvLimitedResourceName }
        ::= { rdbmsSrvLimitedResourceTable 1 }

  RdbmsSrvLimitedResourceEntry ::=
        SEQUENCE {
            rdbmsSrvLimitedResourceName          DisplayString,
            rdbmsSrvLimitedResourceID            AutonomousType,
            rdbmsSrvLimitedResourceLimit         INTEGER,
            rdbmsSrvLimitedResourceCurrent       INTEGER,
            rdbmsSrvLimitedResourceHighwater     INTEGER,
            rdbmsSrvLimitedResourceFailures      Counter32,
            rdbmsSrvLimitedResourceDescription   DisplayString
        }

  rdbmsSrvLimitedResourceName          OBJECT-TYPE
        SYNTAX          DisplayString
        MAX-ACCESS      not-accessible
        STATUS          current
        DESCRIPTION
            "The name of the resource, for instance 'threads' or
             'semaphores', or 'buffer pages'"
        ::= { rdbmsSrvLimitedResourceEntry  1 }

  rdbmsSrvLimitedResourceID OBJECT-TYPE
        SYNTAX                AutonomousType
        MAX-ACCESS            read-only
        STATUS                current
        DESCRIPTION
            "The ID of the resource which may be described in some other
             MIB.  If there is no ID for this rdbmsSrvLimitedResourceName,
             attempts to access this object will return noSuchName
             (SNMPv1) or noSuchInstance (SNMPv2)."
        ::= { rdbmsSrvLimitedResourceEntry 2 }

  rdbmsSrvLimitedResourceLimit          OBJECT-TYPE
        SYNTAX          INTEGER (1..2147483647)
        MAX-ACCESS      read-write
        STATUS          current
```

         DESCRIPTION
             "The maximum value the resource use may attain.

              Note that a compliant agent does not need to
              allow write access to this object."

         ::= { rdbmsSrvLimitedResourceEntry 3 }

   rdbmsSrvLimitedResourceCurrent   OBJECT-TYPE
       SYNTAX   INTEGER (1..2147483647)
       MAX-ACCESS   read-only
       STATUS   current
       DESCRIPTION
           "The current value for the resource."
       ::= { rdbmsSrvLimitedResourceEntry 4 }

   rdbmsSrvLimitedResourceHighwater   OBJECT-TYPE
       SYNTAX   INTEGER (1..2147483647)
       MAX-ACCESS   read-only
       STATUS   current
       DESCRIPTION
           "The maximum value of the resource seen since applUpTime
            was reset."
       ::= { rdbmsSrvLimitedResourceEntry 5 }

   rdbmsSrvLimitedResourceFailures   OBJECT-TYPE
       SYNTAX   Counter32
       MAX-ACCESS   read-only
       STATUS   current
       DESCRIPTION
           "The number of times the system wanted to exceed the limit of
            the resource since applUpTime was reset."
       ::= { rdbmsSrvLimitedResourceEntry 6 }

   rdbmsSrvLimitedResourceDescription   OBJECT-TYPE
       SYNTAX   DisplayString
       MAX-ACCESS   read-write
       STATUS   current
       DESCRIPTION
           "A description of the resource and the meaning of the integer
            units used for Limit, Current, and Highwater.

            Note that a compliant agent does not need to
            allow write access to this object."

       ::= { rdbmsSrvLimitedResourceEntry 7 }

```
   ----------------------------------------------------------------

rdbmsRelTable      OBJECT-TYPE
    SYNTAX        SEQUENCE OF RdbmsRelEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        "A table relating databases and servers present on a host."
    ::= { rdbmsObjects 9 }

rdbmsRelEntry      OBJECT-TYPE
    SYNTAX        RdbmsRelEntry
    MAX-ACCESS    not-accessible
    STATUS        current
    DESCRIPTION
        "An entry relating a single database server to a single
         database to which it may provide access.  The table is
         indexed first by the index of rdbmsDbTable, and then
         rdbmsSrvTable, so that all servers capable of providing
         access to a given database may be found by SNMP traversal
         operations (get-next and get-bulk).  The makeup of this table
         depends on the product's architecture, e.g. if it is one
         server - many databases, then each server will appear n
         times, where n is the number of databases it may access, and
         each database will appear once.  If the architecture is one
         database - many servers, then each server will appear once
         and each database will appear n times, where n is the number
         of servers that may be accessing it."
    INDEX  { rdbmsDbIndex, applIndex }
    ::= { rdbmsRelTable 1 }

RdbmsRelEntry ::=
    SEQUENCE {
        rdbmsRelState           INTEGER,
        rdbmsRelActiveTime      DateAndTime
    }

rdbmsRelState      OBJECT-TYPE
    SYNTAX         INTEGER{
                    other(1),
                    active(2),
                    available(3),
                    restricted(4),
                    unavailable(5)
                    }
    MAX-ACCESS    read-only
    STATUS        current
    DESCRIPTION
```

           "The state of this server's access to this database.
            Active(2) means the server is actively using the database.
            Available(3) means the server could use the database if
            necessary. Restricted(4) means the database is in some
            administratively determined state of less-than-complete
            availability. Unavailable(5) means the database is not
            available through this server. Other(1) means the
            database/server is in some other condition, possibly
            described in the vendor private MIB."

       ::= { rdbmsRelEntry 1 }

  rdbmsRelActiveTime OBJECT-TYPE
      SYNTAX   DateAndTime
      MAX-ACCESS   read-only
      STATUS   current
      DESCRIPTION
           "The time the database was made active by the server. If an
            instance of rdbmsRelState is not active(1), then attempts to
            access the corresponding instance of this object may result
            in either noSuchName (SNMPv1) or noSuchInstance (SNMPv2)
            being returned by the agent."
       ::= { rdbmsRelEntry 2 }

  -- Well known resources for which limits, high water marks,
  -- access or allocation failures, and current levels of use
  -- are possibly available in either the rdbmsDbLimitedResources
  -- or the rdbmsSrvLimitedResources tables.

  rdbmsWellKnownLimitedResources OBJECT IDENTIFIER
          ::= { rdbmsObjects 10 }

  rdbmsLogSpace   OBJECT-IDENTITY
                   STATUS   current
                   DESCRIPTION
                   "Storage allocated for redo and undo logs."
          ::= { rdbmsWellKnownLimitedResources 1}

     ----

  rdbmsTraps   OBJECT IDENTIFIER ::= { rdbmsMIB 2 }

  rdbmsStateChange   NOTIFICATION-TYPE
      OBJECTS   { rdbmsRelState }
      STATUS   current
      DESCRIPTION

          "An rdbmsStateChange trap signifies that one of the database
           server/databases managed by this agent has changed its
           rdbmsRelState in a way that makes it less accessible for use.
           For these purposes, both active(2) and available(3) are
           considered fully accessible. The state sent with the trap is
           the new, less accessible state."
       ::= { rdbmsTraps 1 }

   rdbmsOutOfSpace NOTIFICATION-TYPE
       OBJECTS   { rdbmsSrvInfoDiskOutOfSpaces }
       STATUS   current
       DESCRIPTION
           "An rdbmsOutOfSpace trap signifies that one of the database
            servers managed by this agent has been unable to allocate
            space for one of the databases managed by this agent. Care
            should be taken to avoid flooding the network with these
            traps."
       ::= { rdbmsTraps 2 }

     -- compliance information

     rdbmsConformance   OBJECT IDENTIFIER ::= { rdbmsMIB 3 }
     rdbmsCompliances   OBJECT IDENTIFIER ::= { rdbmsConformance 1 }
     rdbmsGroups   OBJECT IDENTIFIER ::= { rdbmsConformance 2 }

     -- compliance statements

     rdbmsCompliance   MODULE-COMPLIANCE
         STATUS   current
         DESCRIPTION
             "The compliance statement for SNMP entities which
              implement the RDBMS MIB"
         MODULE HOST-RESOURCES-MIB
             MANDATORY-GROUPS   { hrSystem }
         MODULE APPLICATION-MIB
             MANDATORY-GROUPS { applGroup }
         MODULE RDBMS-MIB
             MANDATORY-GROUPS { rdbmsGroup }

         GROUP rdbmsGroup
             DESCRIPTION
                 "The rdbmsGroup is mandatory, but no write access
                  to objects is required for compliance."
             OBJECT   rdbmsDbContact
             MIN-ACCESS read-only
             DESCRIPTION

```
            "A compliant system need not allow write-access to this
            object."
       OBJECT      rdbmsDbParamCurrValue
       MIN-ACCESS  read-only
       DESCRIPTION
            "A compliant system need not allow write-access to this
            object."
       OBJECT      rdbmsDbParamComment
       MIN-ACCESS  read-only
       DESCRIPTION
            "A compliant system need not allow write-access to this
            object."
       OBJECT      rdbmsDbLimitedResourceLimit
       MIN-ACCESS  read-only
       DESCRIPTION
            "A compliant system need not allow write-access to this
            object."
       OBJECT      rdbmsDbLimitedResourceDescription
       MIN-ACCESS  read-only
       DESCRIPTION
            "A compliant system need not allow write-access to this
            object."
       OBJECT      rdbmsSrvContact
       MIN-ACCESS  read-only
       DESCRIPTION
            "A compliant system need not allow write-access to this
            object."
       OBJECT      rdbmsSrvInfoMaxInboundAssociations
       MIN-ACCESS  read-only
       DESCRIPTION
            "A compliant system need not allow write-access to this
            object."
       OBJECT      rdbmsSrvParamCurrValue
       MIN-ACCESS  read-only
       DESCRIPTION
            "A compliant system need not allow write-access to this
            object."
       OBJECT      rdbmsSrvParamComment
       MIN-ACCESS  read-only
       DESCRIPTION
            "A compliant system need not allow write-access to this
            object."
       OBJECT      rdbmsSrvLimitedResourceLimit
       MIN-ACCESS  read-only
       DESCRIPTION
            "A compliant system need not allow write-access to this
            object."
       OBJECT      rdbmsSrvLimitedResourceDescription
```

```
           MIN-ACCESS  read-only
           DESCRIPTION
               "A compliant system need not allow write-access to this
               object."

      ::= { rdbmsCompliances 1 }

  -- units of conformance

     -- rdbmsStateChange and rdbmsOutOfSpace traps are omitted
     -- intentionally.  They are not required or part of any
     -- conformance group.

  rdbmsGroup    OBJECT-GROUP
      OBJECTS   {
                  rdbmsDbPrivateMibOID, rdbmsDbVendorName,
                  rdbmsDbName, rdbmsDbContact,

                  rdbmsDbInfoProductName, rdbmsDbInfoVersion,
                  rdbmsDbInfoSizeUnits, rdbmsDbInfoSizeAllocated,
                  rdbmsDbInfoSizeUsed, rdbmsDbInfoLastBackup,

                  rdbmsDbParamCurrValue, rdbmsDbParamComment,

                  rdbmsDbLimitedResourceLimit,
                  rdbmsDbLimitedResourceCurrent,
                  rdbmsDbLimitedResourceHighwater,
                  rdbmsDbLimitedResourceFailures,
                  rdbmsDbLimitedResourceDescription,

                  rdbmsSrvPrivateMibOID, rdbmsSrvVendorName,
                  rdbmsSrvProductName, rdbmsSrvContact,

                  rdbmsSrvInfoStartupTime,
                  rdbmsSrvInfoFinishedTransactions,
                  rdbmsSrvInfoDiskReads, rdbmsSrvInfoDiskWrites,
                  rdbmsSrvInfoLogicalReads, rdbmsSrvInfoLogicalWrites,
                  rdbmsSrvInfoPageReads, rdbmsSrvInfoPageWrites,
                  rdbmsSrvInfoHandledRequests,
                  rdbmsSrvInfoRequestRecvs, rdbmsSrvInfoRequestSends,
                  rdbmsSrvInfoHighwaterInboundAssociations,
                  rdbmsSrvInfoMaxInboundAssociations,

                  rdbmsSrvParamCurrValue, rdbmsSrvParamComment,

                  rdbmsSrvLimitedResourceLimit,
                  rdbmsSrvLimitedResourceCurrent,
                  rdbmsSrvLimitedResourceHighwater,
```

```
                    rdbmsSrvLimitedResourceFailures,
                    rdbmsSrvLimitedResourceDescription,

                    rdbmsRelState, rdbmsRelActiveTime }
        STATUS    current
        DESCRIPTION
            "A collection of objects providing basic instrumentation of an
             RDBMS entity."
        ::= { rdbmsGroups 1 }

    ------------------------------------------------------------------

    END
```

5. Acknowledgements

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        1994.

7. Security Considerations

    Security issues are not discussed in this memo.

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