Definitions of Managed Objects for Applications

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1. Abstract

This memo defines an experimental portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it describes a basic set of managed objects for fault, configuration and performance management of applications.

This memo does not specify a standard for the Internet community.
2. The SNMPv2 Network Management Framework

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

- STD 17, RFC 1213 [1] defines MIB-II, the core set of managed objects for the Internet suite of protocols.
- RFC 1903 Textual Conventions for Version 2 of the Simple Network Management Protocol (SNMPv2)
- RFC 1907 Management Information Base for Version 2 of the Simple Network Management Protocol (SNMPv2)
- RFC 1908 Coexistence between Version 1 and Version 2 of the Internet-standard Network Management Framework

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

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[1]. 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 object descriptor, to refer to the object type.
3. Overview

The primary purpose of computing technologies is the execution of application software. These applications, typically specialized collections of executables, files and interprocess communications exist to solve business, scientific or other "problems". The fault, performance monitoring and control of application software across it's life on a host computer is of great economic importance. For the purposes of our work, we define applications as one or more units of executable code and other resources, installed on a single host system that a manager may think of as a single object for management purposes.

The information described by the objects in the System Application MIB support configuration, fault and performance management of some of the basic attributes of application software. The information allows for the description of applications as a collection of executables, and files installed and executing on a host computer.

This draft is concerned primarily with and models application information resident on a host computer which is discoverable in a rudimentary fashion by today's agent and operating systems technologies. This approach was taken to insure ease and speed of implementation, while allowing room for future growth.

We believe that this work will be followed by the subsequent modeling and specification of management information accessible via application instrumentation. These new "appl MIB" objects will participate as multiple Generic Application MIB instances within each host platform.
4. The Structure of the MIB

The System Application MIB structure reflects the notion of applications which have been installed on a system and which may contain many components some of which are executables, others are not.

The objects are arranged into the following groups:

- System Application Installed Group
- System Application Run Group

The System Application Installed group consists of two tables. The first, the sysApplInstalledTable exists to capture what applications are installed on a particular host. The second, the sysApplCfgElmTable, provides information regarding the executables and non executable files which collectively compose the application. This information is discoverable provided that certain conventions are followed by administrators during the installation of host application software. Through these two tables administrators will be able to determine which applications have been installed on a system and what their constituent components are.

The System Application Run Group: This group consists of two pairs of tables (four tales) and seven scalars.

The first set of tables contains the sysApplRunTable and the SysApplPastRun Table. The sysApplRunTable contains the application instances which are currently running on the host. An entry is created in this table for each instance on an application when it is started. The sysApplPastRunTable contains table rows corresponding to instances of applications which have previously executed on the host. Entries to this table are made when an application has terminated. Coincident with this, the table entry which represents the application is removed from the SysApplRunTable. Table rows are removed from the SysApplPastRunTable according to values set in two scalars, sysApplPastRunTableSizeLimit and sysApplPastRunTableTimeLimit. These objects specify the maximum table size of the sysApplPastRunTable as well as the maximum age of its table entries.

A parallel structure exists for the running processes associated with an application.

The sysApplElmtRunTable contains the process instances which are currently running on the host. An entry is created in this table for each instance on a process at the time it is started. The sysApplElmtPastRunTable contains table rows corresponding to instances of processes which have previously executed on the host. Entries to this table are made when the process has terminated.
Coincident with this, the table entry which represents the process is removed from the SysApplElmtRunTable. Table rows are removed from the SysApplElmtPastRunTable according to values set in two scalars, sysApplElmtPastRunTableSizeLimit and sysApplElmtPastRunTableTimeLimit. These objects specify the maximum table size of the sysApplElmtPastRunTable as well as the maximum age of its table entries.
5. Definitions

SYSAPPL-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE,
    Integer32, TimeTicks, Counter32
    FROM SNMPv2-SMI
    DisplayString, DateAndTime
    FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP
    FROM SNMPv2-CONF
    mib-2 FROM RFC1213-MIB;

-- System Application MIB

sysApplMIB MODULE-IDENTITY
    LAST-UPDATED "96043000000Z"
    ORGANIZATION "IETF Applications MIB Working Group"
    CONTACT-INFO
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DESCRIPTION
"The MIB module defines an application on a system platform"
::= { mib-2 9999 }

sysApplOBJ OBJECT IDENTIFIER ::= { sysApplMIB 1 }
sysApplInstalled OBJECT IDENTIFIER ::= { sysApplOBJ 1 }
sysApplRun OBJECT IDENTIFIER ::= { sysApplOBJ 2 }
sysApplNotifications OBJECT IDENTIFIER ::= { sysApplMIB 2 }
sysApplConformance OBJECT IDENTIFIER ::= { sysApplMIB 3 }

-- textual conventions
Kbytes ::= Integer32
-- This data type is intended as a shorthand for the representation
-- of kilobytes

-- The system installed applications group provides information
-- about packages and all of their constituent elements such as
-- executable and configuration files found on a system.

-- The system installed applications table provides information
-- software packages loaded on a system. These packages can be
-- a combination of many different files. Agents should provide
-- index to entry consistency across agent reboots.

sysApplInstalledTable OBJECT-TYPE
SYNTAX      SEQUENCE OF SysApplInstalledEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table describing the software installed on a
platform."
::= { sysApplInstalled 1 }

sysApplInstalledEntry OBJECT-TYPE
SYNTAX      SysApplInstalledEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The logical row describing installed software
components."
INDEX    { sysApplInstalledIndex }
::= { sysApplInstalledTable 1 }

SysApplInstalledEntry ::= SEQUENCE {
    sysApplInstalledIndex         Integer32,
    sysApplInstalledManufacturer  DisplayString,
}
sysApplInstalledProductName OBJECT-TYPE
SYNTAX       DisplayString,
sysApplInstalledVersion OBJECT-TYPE
SYNTAX       DisplayString,
sysApplInstalledSerialNumber OBJECT-TYPE
SYNTAX       DisplayString,
sysApplInstalledDate OBJECT-TYPE
SYNTAX       DateAndTime,
sysApplInstalledLocation OBJECT-TYPE
SYNTAX       DisplayString
}

class sysApplInstalledIndex OBJECT-TYPE
SYNTAX       Integer32 (1..'7fffffff'h)
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION
  "An arbitrary, small integer used only for
   indexing purposes. Generally monotonically
   increasing from 1 as new applications are installed."
 ::= { sysApplInstalledEntry 1 }

class sysApplInstalledManufacturer OBJECT-TYPE
SYNTAX       DisplayString
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
  "The Manufacturer of the software application."
 ::= { sysApplInstalledEntry 2 }

class sysApplInstalledProductName OBJECT-TYPE
SYNTAX       DisplayString
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
  "The name provided to the software application by the
   Manufacturer."
 ::= { sysApplInstalledEntry 3 }

class sysApplInstalledVersion OBJECT-TYPE
SYNTAX       DisplayString
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
  "The version of the product assigned by the
   manufacturer of the software."
 ::= { sysApplInstalledEntry 4 }

class sysApplInstalledSerialNumber OBJECT-TYPE
SYNTAX       DisplayString
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION
  "The serial number of the software assigned by the
   manufacturer."
 ::= { sysApplInstalledEntry 5 }

class sysApplInstalledDate OBJECT-TYPE

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SYNTAX       DateAndTime
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
"The date and time this software application was installed on
the host."
::= { sysApplInstalledEntry 6 }

sysApplInstalledLocation OBJECT-TYPE
SYNTAX       DisplayString
MAX-ACCESS   read-only
STATUS       current
DESCRIPTION  
"The path name where the executables are stored for the
application."
::= { sysApplInstalledEntry 7 }

-- The sysApplCfgElmt Table details the elements which comprise the
-- application defined in the sysApplInstalled Table. Each entry in
-- this table has an index to the sysApplInstalled table. As a result
-- there may be many entries in this table for each instance in the
-- sysApplInstalled Table.

sysApplCfgElmtTable OBJECT-TYPE
SYNTAX       SEQUENCE OF SysApplCfgElmtEntry
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION  
"The table describing the application executables and non
executables installed on a platform."
::= { sysApplInstalled 2 }

sysApplCfgElmtEntry OBJECT-TYPE
SYNTAX       SysApplCfgElmtEntry
MAX-ACCESS   not-accessible
STATUS       current
DESCRIPTION  
"The logical row describing installed software executables and
don executable components of an application."
INDEX        {sysApplInstalledIndex,
                      sysApplCfgElmtIndex}
::= { sysApplCfgElmtTable 1 }

SysApplCfgElmtEntry ::= SEQUENCE {
    sysApplCfgElmtIndex                  Integer32,
    sysApplCfgElmtName                  DisplayString,
    sysApplCfgElmtType                  INTEGER,
    sysApplCfgElmtDate                  DateAndTime,
    sysApplCfgElmtPath                  DisplayString,
    sysApplCfgElmtSize                  Kbytes,
    sysApplCfgElmtRole                  BIT STRING
}
sysApplCfgElmtIndex OBJECT-TYPE
SYNTAX      Integer32 (1..'7fffffff'h)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
   "An arbitrary, small integer used for indexing purposes.
   Generally monotonically increasing from 1 as new elements
   are installed in the system."
 ::= { sysApplCfgElmtEntry 1 }

sysApplCfgElmtName OBJECT-TYPE
SYNTAX      DisplayString
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "The name of this element which is contained in the
   application."
 ::= { sysApplCfgElmtEntry 2 }

sysApplCfgElmtType OBJECT-TYPE
SYNTAX      INTEGER {
               executable(1),
               nonexecutable(2)
            }
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "The type of element that is part of the installed
   application."
 ::= { sysApplCfgElmtEntry 3 }

sysApplCfgElmtDate OBJECT-TYPE
SYNTAX      DateAndTime
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "The date and time that this component was installed on the
   system."
 ::= { sysApplCfgElmtEntry 4 }

sysApplCfgElmtPath OBJECT-TYPE
SYNTAX      DisplayString
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "The full path name of this file."
 ::= { sysApplCfgElmtEntry 5 }

sysApplCfgElmtSize OBJECT-TYPE
SYNTAX      Kbytes
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The size of the file in Kbytes."
::= { sysApplCfgElmtEntry 6 }

sysApplCfgElmtRole OBJECT-TYPE
SYNTAX BIT STRING
{ executable(0),
  -- An application may have one or
  -- more executable elements. The rest of the bits
  -- have no meaning if the element is not executable.
  exclusive(1),
  -- Only one copy of an exclusive element
  -- may be running.
  interesting(2),
  -- An application may have zero or more
  -- interesting elements. Only tables, but all
  -- executable show in the running tables.
  required(3),
  -- An application may have zero or more
  -- required elements. At least one must be running
  -- to indicate that the application is running
  -- and healthy.
  dependent(4) }
-- An application may have zero or more
-- dependent elements. Dependent elements may
-- not be running unless required elements
-- are.
MAX-ACCESS read-write
STATUS current

DESCRIPTION
"An operator assigned value used in the determination of
application status. This value is used by the agent to determine
both the mapping of started processes to the initiation
of an application, as well as to allow for a determination of
application health."
::= { sysApplCfgElmtEntry 7 }

-- The sysApplRun Group contains information about applications
-- are currently running or have run on the host.
-- The sysApplRunTable contains entries for applications currently
-- executing on the platform.

sysApplRunTable OBJECT-TYPE
SYNTAX SEQUENCE OF SysApplRunEntry
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION
"The table describes the applications which are executing
on the host. Each time an application is run
an entry is created in this table. When an application ends,
the entry is removed from this table and placed in the
SysApplPastRunTable."
::= { sysApplRun 1 }

sysApplRunEntry OBJECT-TYPE
SYNTAX SysApplRunEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The logical row describing the applications which are
currently running on this host. Entries
remain in this table until the applications end and
are then added to the sysApplPastRunTable."
INDEX { sysApplRunIndex }
::= { sysApplRunTable 1 }

SysApplRunEntry ::= SEQUENCE {
  sysApplRunIndex                         Integer32,
  sysApplRunInstalledIndex                Integer32,
  sysApplRunLastStarted                   DateAndTime,
  sysApplRunCurrentState                  INTEGER,
  sysApplRunEnded                         DateAndTime
}

sysApplRunIndex OBJECT-TYPE
SYNTAX     Integer32 (1..‘7fffffff’h)
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The index for this table. An arbitrary small integer used only
for indexing purposes. Generally monotonically increasing
from 1 as new applications are started on the host."
::= { sysApplRunEntry 1 }

sysApplRunInstalledIndex OBJECT-TYPE
SYNTAX     Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The pointer to the installed application table. An arbitrary
small integer used only for indexing purposes."
::= { sysApplRunEntry 2 }

sysApplRunLastStarted OBJECT-TYPE
SYNTAX     DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The date and time that the application was last started."
::= { sysApplRunEntry 3 }

sysApplRunCurrentState OBJECT-TYPE
SYNTAX     INTEGER {
  running (1),
  runnable (2), -- waiting for resource (CPU, etc.)
  waiting (3), -- waiting for event
  exiting (4), -- other invalid state
  other (5)
  }
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The current state of the running application."
::= { sysApplRunEntry 4 }

sysApplRunEnded OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION "The DateAndTime the application exited."
::= { sysApplRunEntry 5 }

-- The sysApplPastRunTable contains entries for applications
-- previously run on the platform. Entries are added to this table
-- when an application becomes inactive. Entries are removed from this
-- table when either the table size reaches a maximum as determined by
-- the sysApplPastRunTableSizeLimit or when an entry has aged to exceed a
-- time limit as set by sysApplPastRunTimeLimit. When table size is exceeded
-- the oldest entry as determined by the smallest sysApplPastRunIndex,
-- will be removed.

sysApplPastRunTable OBJECT-TYPE
SYNTAX SEQUENCE OF SysApplPastRunEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The table describes the applications
have executed on the host. Each time an application is terminated
an entry is created in this table. Table size is controlled
by the sysApplPastRunTableSizeLimit object and the
sysApplPastRunTimeLimit."
::= { sysApplRun 2 }

sysApplPastRunEntry OBJECT-TYPE
SYNTAX SysApplPastRunEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION "The logical row describing the applications which are
have run on this host. Entries
remain in this table until they are rolled out according
to the sysApplPastRunTableSizeLimit object or the
sysApplPastRunTimeLimit object."
INDEX { sysApplPastRunIndex }
::= { sysApplPastRunTable 1 }

SysApplPastRunEntry ::= SEQUENCE {
   sysApplPastRunIndex                     Integer32,
   sysApplPastRunInstalledIndex            Integer32,
   sysApplPastRunLastStarted               DateAndTime,

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sysApplPastRunCurrentState  INTEGER,
sysApplPastRunEnded        DateAndTime
}

sysApplPastRunIndex OBJECT-TYPE
SYNTAX      Integer32 (1..'7ffffff'h)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
 "The index for this table. An arbitrary small integer
  matching the value of the removed sysApplRunIndex
  corresponding to this row."
 ::= { sysApplPastRunEntry 1 }

sysApplPastRunInstalledIndex OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The pointer to the installed application table. An arbitrary
  small integer used only for indexing purposes."
 ::= { sysApplPastRunEntry 2 }

sysApplPastRunLastStarted OBJECT-TYPE
SYNTAX      DateAndTime
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The date and time that the application was started."
 ::= { sysApplPastRunEntry 3 }

sysApplPastRunCurrentState OBJECT-TYPE
SYNTAX      INTEGER {
  complete (1), -- normal exit at sysApplRunEnded
  failed (2),   -- abnormal exit
  other (3)
}
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The
  exit state."
 ::= { sysApplPastRunEntry 4 }

sysApplPastRunEnded OBJECT-TYPE
SYNTAX      DateAndTime
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
 "The DateAndTime the application exited."
 ::= { sysApplPastRunEntry 5 }

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-- The sysAppElmtRun Table consists of entries for elements of
-- application which are running on the host
-- system.

sysAppElmtRunTable OBJECT-TYPE
SYNTAX      SEQUENCE OF SysAppElmtRunEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table describes the processes which are executing
on the host as part of an application. It is
possible to have multiple entries in this table for each
application. Entries are removed from this table when the
process terminates."
::= { sysApplRun 3 }

sysAppElmtRunEntry OBJECT-TYPE
SYNTAX      SysAppElmtRunEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The logical row describing the processes which are
currently running on this host as part of an
application. Entries remain in this table until they
are rolled out and moved to the sysAppElmtPastRunTable
when the terminate."
INDEX    { sysApplRunIndex,sysAppElmtRunIndex }
::= { sysAppElmtRunTable   1 }

SysAppElmtRunEntry ::= SEQUENCE {
    sysAppElmtRunIndex             Integer32,
sysAppElmtRunElemID            Integer32,
sysAppElmtRunHRID              Integer32,
sysAppElmtRunTimeStarted       DateAndTime,
sysAppElmtRunTimeEnded         DateAndTime,
sysAppElmtRunState             INTEGER,
sysAppElmtRunName              DisplayString,
sysAppElmtRunParameters        DisplayString,
sysAppElmtRunType              INTEGER,
sysAppElmtRunCPU               TimeTicks,
sysAppElmtRunMemory            Integer32,
sysAppElmtRunNumTCon           Integer32,
sysAppElmtRunNumFiles          Integer32
}

sysAppElmtRunIndex OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The index for this table. An arbitrary, small integer used only
for indexing purposes. Generally monotonically increasing from
1 as new processes start as part of an application."
::= { sysApplElmtRunEntry 1 }

sysApplElmtRunElemID OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The index into the installed element table. An arbitrary, small
integer used only for indexing purposes."
::= { sysApplElmtRunEntry 2 }

sysApplElmtRunHRID OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The index into the Host Resources running software table."
::= { sysApplElmtRunEntry 3 }

sysApplElmtRunTimeStarted OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The time the process was started."
::= { sysApplElmtRunEntry 4 }

sysApplElmtRunTimeEnded OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The time the process ended."
::= { sysApplElmtRunEntry 5 }

sysApplElmtRunState OBJECT-TYPE
SYNTAX INTEGER {
  running (1),
  runnable (2), -- waiting for resource (CPU, etc.)
  waiting (3), -- waiting for event
  exiting (4), -- other invalid state
  other (5)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The state of the running process."
::= { sysApplElmtRunEntry 6 }

sysApplElmtRunName OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The full path name of the process."
::= { sysApplElmtRunEntry 7 }

sysApplElmtRunParameters OBJECT-TYPE
SYNTAX    DisplayString
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The starting parameters for the process."
::= { sysApplElmtRunEntry 8 }

sysApplElmtRunType OBJECT-TYPE
SYNTAX    INTEGER {
    unknown (1),
    operatingSystem (2),
    deviceDriver (3),
    application (4)
}
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The type of the executable."
::= { sysApplElmtRunEntry 9 }

sysApplElmtRunCPU OBJECT-TYPE
SYNTAX    TimeTicks
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The total CPU time of the running process."
::= { sysApplElmtRunEntry 10 }

sysApplElmtRunMemory OBJECT-TYPE
SYNTAX    Integer32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The average memory measured in Kbytes used by this
element."
::= { sysApplElmtRunEntry 11 }

sysApplElmtRunNumTCon OBJECT-TYPE
SYNTAX    Integer32
MAX-ACCESS read-only
STATUS     current
DESCRIPTION
"The number of transport connections used by the process."
::= { sysApplElmtRunEntry 12 }

sysApplElmtRunNumFiles OBJECT-TYPE
SYNTAX    Integer32
MAX-ACCESS read-only
The number of files open by the element.

::= { sysApplElmtRunEntry 13 }

The sysApplElmtPastRunTable consists of entries for elements of application have previously executed on the host system.

sysApplElmtPastRunTable OBJECT-TYPE
SYNTAX      SEQUENCE OF SysApplElmtPastRunEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The table describes the processes which have previously executed on the host as part of an application. It is possible to have multiple entries in this table for each application. Entries are added to this table when the corresponding process terminates."
::= { sysApplRun 4 }

sysApplElmtPastRunEntry OBJECT-TYPE
SYNTAX      SysApplElmtPastRunEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
"The logical row describing the processes which have run on this host as part of an application. Entries are added in this table when an application process terminates. They are rolled out either when a table limit size is reached, as set in sysApplElmtPastRunSizeLimit or until they age past a time limit as set by sysApplElmtPastRunTimeLimit."
INDEX    { sysApplPastRunIndex,sysApplElmtPastRunIndex }
::= { sysApplElmtPastRunTable  1 }

SysApplElmtPastRunEntry ::= SEQUENCE {
    sysApplElmtPastRunIndex                 Integer32,
sysApplElmtPastRunElemID                Integer32,
sysApplElmtPastRunHRID                  Integer32,
sysApplElmtPastRunTimeStarted           DateAndTime,
sysApplElmtPastRunTimeEnded             DateAndTime,
sysApplElmtPastRunState                 INTEGER,
sysApplElmtPastRunName                  DisplayString,
sysApplElmtPastRunParameters            DisplayString,
sysApplElmtPastRunType                  INTEGER,
sysApplElmtPastRunCPU                   TimeTicks,
sysApplElmtPastRunMemory                Integer32,
sysApplElmtPastRunNumTCon               Integer32,
sysApplElmtPastRunNumFiles              Integer32
}
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sysApplElmtPastRunIndex OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The index for this table. An arbitrary, small integer
assigned by the agent equal to the corresponding sysApplElmtRunIndex
which was removed from the sysApplElmtRunTable."
 ::= { sysApplElmtPastRunEntry 1 }

sysApplElmtPastRunElemID OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The index into the installed element table. An arbitrary, small
integer used only for indexing purposes."
 ::= { sysApplElmtPastRunEntry 2 }

sysApplElmtPastRunHRID OBJECT-TYPE
SYNTAX Integer32
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The index into the Host Resources running software table."
 ::= { sysApplElmtPastRunEntry 3 }

sysApplElmtPastRunTimeStarted OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The time the process was started."
 ::= { sysApplElmtPastRunEntry 4 }

sysApplElmtPastRunTimeEnded OBJECT-TYPE
SYNTAX DateAndTime
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The time the process ended."
 ::= { sysApplElmtPastRunEntry 5 }

sysApplElmtPastRunState OBJECT-TYPE
SYNTAX INTEGER {
    completed (1),
    failed (2), --
    other (3)
}
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The state of ending."
::= { sysApplElmtPastRunEntry 6 }

sysApplElmtPastRunName OBJECT-TYPE
SYNTAX    DisplayString
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
    "The full path name of the process."
::= { sysApplElmtPastRunEntry 7 }

sysApplElmtPastRunParameters OBJECT-TYPE
SYNTAX    DisplayString
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
    "The starting parameters for the process."
::= { sysApplElmtPastRunEntry 8 }

sysApplElmtPastRunType OBJECT-TYPE
SYNTAX    INTEGER {
    unknown (1),
    operatingSystem (2),
    deviceDriver (3),
    application (4)
}
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
    "The type of the executable."
::= { sysApplElmtPastRunEntry 9 }

sysApplElmtPastRunCPU OBJECT-TYPE
SYNTAX    TimeTicks
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
    "The total CPU time of the running process."
::= { sysApplElmtPastRunEntry 10 }

sysApplElmtPastRunMemory OBJECT-TYPE
SYNTAX    Integer32
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
    "The average memory measured in Kbytes used by this element."
::= { sysApplElmtPastRunEntry 11 }

sysApplElmtPastRunNumTCon OBJECT-TYPE
SYNTAX    Integer32
MAX-ACCESS read-only
STATUS    current
DESCRIPTION
"The number of transport connections used by the process."
::= { sysApplElmtPastRunEntry 12 }

sysApplElmtPastRunNumFiles OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"The number of files open by the element."
::= { sysApplElmtPastRunEntry 13 }

-- Additional Scalar objects to control table sizes

sysApplPastRunTableSizeLimit OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
"The maximum size to allow the sysApplPastRunTable to
grow before entries are removed, as viewed
by the agent. Entries will be
removed on the basis of oldest sysApplPastRunEnded
value first."
DEFVAL      { 500 }
::= { sysApplRun 5 }

sysApplPastRunTableItemsRem OBJECT-TYPE
SYNTAX      Counter32
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
"A counter of entries removed by the agent during its lifetime
from the sysApplPastRunTable because of table size
limitations as set in sysApplPastRunTableSizeLimit."
::= { sysApplRun 6 }

sysApplPastRunTableTimeLimit OBJECT-TYPE
SYNTAX      Integer32
UNITS       "seconds"
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
"The minimum time in seconds which an entry
in the sysApplPastRunTable may exist
before it is removed."
DEFVAL      { 3600 }
::= { sysApplRun 7 }

sysApplElemPastRunSizeLimit OBJECT-TYPE
SYNTAX      Integer32
MAX-ACCESS  read-write
STATUS current
DESCRIPTION "The maximum size to allow the sysApplElmtPastRun table to grow before entries are removed as viewed by the agent. Entries will be removed on the basis of oldest sysApplElmtPastRunTimeEnded value first."
DEFVAL { 500 }
::= { sysApplRun 8 }

sysApplElemPastRunTableItemsRem OBJECT-TYPE
SYNTAX Counter32
MAX-ACCESS read-only
STATUS current
DESCRIPTION "A counter of entries removed by the agent during its lifetime from the sysApplElemPastRunTable because of table size limitations as set in sysApplElemPastRunTableSizeLimit."
::= { sysApplRun 9 }

sysApplElemPastRunTimeLimit OBJECT-TYPE
SYNTAX Integer32
UNITS "seconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION "The minimum time in seconds which an entry in the sysApplElemPastRunTable may exist before it is removed."
DEFVAL { 500 }
::= { sysApplRun 10 }

sysApplAgentPollInterval OBJECT-TYPE
SYNTAX Integer32
UNITS "seconds"
MAX-ACCESS read-write
STATUS current
DESCRIPTION "The minimum time in seconds that an agent will poll the status of the managed resources. A value of 0 indicates that there is no delay in the passing of information from the managed resources to the agent."
DEFVAL { 60 }
::= { sysApplRun 11 }
-- Conformance Macros

sysApplMIBCompliances OBJECT IDENTIFIER ::= { sysApplConformance 1 }
sysApplMIBGroups OBJECT IDENTIFIER ::= { sysApplConformance 2 }

sysApplMIBCompliance MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "Describes the requirements for conformance to
    the System Application MIB"
  MODULE -- this module
    MANDATORY-GROUPS { sysApplInstalledGroup,
      sysApplRunGroup }
  ::= { sysApplMIBCompliances 1 }

sysApplInstalledGroup OBJECT-GROUP
  OBJECTS { sysApplInstalledManufacturer,
    sysApplInstalledProductName,
    sysApplInstalledVersion,
    sysApplInstalledSerialNumber,
    sysApplInstalledDate,
    sysApplInstalledLocation,
    sysApplCfgElmtName,
    sysApplCfgElmtType,
    sysApplCfgElmtDate,
    sysApplCfgElmtPath,
    sysApplCfgElmtSize,
    sysApplCfgElmtRole }
  STATUS current
  DESCRIPTION
    "The system application installed group contains
    information about applications which have been
    installed on the host system."
  ::= { sysApplMIBGroups 1 }

sysApplRunGroup OBJECT-GROUP
  OBJECTS { sysApplRunInstalledIndex,
    sysApplRunLastStarted,
    sysApplRunCurrentState,
    sysApplRunEnded,
    sysApplPastRunInstalledIndex,
    sysApplPastRunLastStarted,
    sysApplPastRunCurrentState,
    sysApplPastRunEnded,
    sysApplElmtRunElemID,
    sysApplElmtRunHRID,
    sysApplElmtRunTimeStarted,
    sysApplElmtRunTimeEnded,
    sysApplElmtRunState,
    sysApplElmtRunName,
    sysApplElmtRunParameters,
    sysApplElmtRunType,
    sysApplElmtRunCPU,
The system application run group contains information about applications and associated elements which have run or are currently running on the host system.

::= { sysApplMIBGroups 2 }

6. Acknowledgements

This document was produced by the Application MIB working group.
7. References

8. Security Considerations

Security issues are not discussed in this memo.
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