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The Simple Times is an openly-available publication devoted to the promotion of the Simple Network Management Protocol. In each issue, *The Simple Times* presents technical articles and featured columns, along with a standards summary and a list of Internet resources. In addition, some issues contain summaries of recent publications and upcoming events.

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Editorial

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One of the interesting additions to the Internet management RFCs are the specifications that define Distributed Management (DISMAN). The idea to distribute management functionality over multiple managers is relatively old and can already be found in the early SNMPv2 drafts, which defined the Manager to Manager (M2M) MIB to facilitate the delegation of polling tasks to intermediate level managers. Since this MIB could only be used for simplistic management tasks, it was generally seen as a starting point for distributed management, and not as the final solution. To develop more powerful distributed management approaches, a new IETF DISMAN working group was therefore formed, and responsibility for the M2M MIB moved to this group.

Currently the DISMAN group is working on three different approaches. The first approach can be seen as the further development of the M2M MIB, and is described in three Internet Drafts: the Expression MIB, the Event MIB and the Notification Log MIB. The second approach is based on scripts and is defined in two RFCs: the Script MIB and the Scheduling MIB. The third approach focuses on MIBs for specific management functions that can be invoked on remote devices. Such MIBs are defined in the Remote Operations Internet Draft. It should be noted that these approaches should not be considered as competitors, but as complements; for a certain task it may be better to use one approach, and for a different task another approach. Unfortunately it is not easy to integrate the three approaches and use, for example, the Scheduling MIB in combination with the Event MIB.

This and an upcoming issue of *The Simple Times* provide an overview of the various DISMAN approaches. In this issue we will focus on the Schedule and Script MIB; in a future issue we will discuss the Event, Expression and Notification Log MIB, as well as the Remote Operations MIB. This issue starts with an article by Alan Luchuk, who discusses the Schedule MIB and gives his experiences while implementing this MIB. The other articles focus on the Script MIB. First David Levi provides an overview of this MIB. Next Éamonn McManus

describes his Script MIB implementation. The third article is by Frank Strauß, who analysed the performance of another Script MIB implementation. Finally Jürgen Quittek and Cornelia Kappler describe some practical experiences with Script MIB applications. As usual, this issue also contains a standards summary, as well as the calendar and announcement section.

The issue you are now reading is already the twentieth issue of *The Simple Times*. The first issue appeared in March 1992 and, including this issue, we have published more than 360 pages of text. Recently a number of people asked whether it would be possible to bundle all issues, find a publisher and print it as book. Such a book could provide an extensive index and would serve as a nice reference. To find out if people would be interested in buying such book, we have added a small survey to our homepage; be sure to complete this survey if you would like to see the first twenty issues of *The Simple Times* as a reference book in your bookshelf.

Schedule MIB

Alan Luchuk, SNMP Research Incorporated

There is a well-known need to perform network management operations at periodic intervals or at scheduled times. For example, a network manager may need to enable or disable network interfaces at certain times of day. The DISMAN-SCHEDULE-MIB was developed to address this need. This article provides an overview of the DISMAN-SCHEDULE-MIB and discusses SNMP Research's implementation experience.

RFC 2591, currently at Proposed Standard status, details the DISMAN-SCHEDULE-MIB. RFC 2591 is a product of the Distributed Management (DISMAN) working group, within the Operations and Management Area of the IETF.

MIB Overview

The DISMAN-SCHEDULE-MIB consists of a single scalar (`schedLocalTime`) and a single table (`schedTable`). The `schedLocalTime` MIB object specifies the agent's notion of the current (real) time. This object is implemented as an 11-octet `DateAndTime` textual convention.

Each row (`schedEntry`) in the `schedTable` specifies a single scheduled event. Each row is indexed by an owner string (`schedOwner`) and an event name string (`schedName`). The `schedOwner` allows multiple users to schedule events in an agent. The `schedName` allows each user to schedule multiple events. The `schedDescr` provides a human-readable description of the scheduled event.

In the `schedTable`, the row indexes are each prefixed by the length of the index string. For example if the `schedOwner` is P, a one-character string, with an ASCII value of 80 (in decimal), the owner index field becomes 1.80. Similarly, if the `schedName` is Q, a one-character string, with an ASCII value of 81 (in decimal), the name index field becomes 1.81. In this example, the complete index for this row would be 1.80.1.81. While making it more difficult to configure, this double-indexing facilitates access control using the view-based access control model defined in RFC 2575.

The `schedRowStatus` is an object with the syntax of the `RowStatus` textual convention. It lets the user manage the status of a table row - the creation, editing, and deletion of rows - in the `schedTable`. The `schedStorageType` object lets the user specify whether the row is saved in non-volatile storage. The `schedAdminStatus` object specifies whether the desired status of the scheduled event is enabled or disabled. The `schedOperStatus` object reports the actual status of the scheduled event.

Setting Objects at the Trigger Time

The `schedVariable` object specifies which MIB object should be set at the specified time. This object is an OID, and it must specify completely the object to be set, including all required instancing information. The `schedValue` object specifies the `Integer32` value set at the scheduled time. If needed, the `schedContextName` object specifies the SNMP context where `schedVariable` occurs.

The DISMAN-SCHEDULE-MIB can set only a single `Integer32` MIB object at the trigger time. If the capability to set multiple `Integer32` objects at the trigger time is needed, multiple events can be scheduled for the same trigger time. If the capability to set non-`Integer32` objects is required, the DISMAN-SCHEDULE-MIB can be coupled with another facility such as the DISMAN-SCRIPT-MIB.

The DISMAN-SCHEDULE-MIB supports setting MIB objects in the same SNMP agent in which the DISMAN-SCHEDULE-MIB is implemented. It does not support setting MIB objects in another SNMP agent on another IP host.

If a scheduled set request fails, the `schedLastFailure` object specifies the error status returned by the most recent set operation. The `schedLastFailed` object, a `DateAndTime` object, reports the date and time of the most recent set failure. The `schedFailures` object reports a count of the number of set failures for this scheduled event.